

The Agriculture of Colombia

By

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PHYSICAL AND ECONOMIC BACKGROUND

The present world-wide war has made the people of the Western Hemisphere acutely aware of the need for closer inter-American cooperation, economically as well as politically. This need has been recognized by statesmen from the time of Simon Bolivar, the Great Liberator, to our own day. But the constructive thought and action of economists and industrialists have been too often directed toward other fields, with the result that many fruitful opportunities for the development of complementary products and industries have been overlooked.

The Western Hemisphere has a variety of climate, soil, and people necessary to insure its almost complete independence of Europe and

¹ The manuscript for this bulletin was completed October 1, 1941.

² Many published works and numerous typewritten reports from United States consuls in Colombia have been extensively drawn upon in the preparation of this report. The Literature Cited covers the sources consulted most often as the work progressed. The author is indebted to many members of the Department of Agriculture who made valuable suggestions from time to time, especially P. G. Minneman. Acknowledgment is also made of indebtedness to E. N. Bressman, Charles L. Luedtke, and Atherton Lee, members of a special mission that studied the agricultural problems of Colombia in 1940 at the request of the Colombian Government. Acknowledgment is due Charles L. Luedtke also for most of the photographs used in the report. The National Federation of Coffee Growers of Colombia furnished all but one of the photographs in the section on coffee.

Asia. Quinine and rubber and other commodities strategic in time of war and essential for health and economic development in peacetime have been transplanted from their native home in the Americas to far away places under alien control.

The part agriculture must play in the development of inter-American collaboration is evident when it is realized that some of the greatest deficiencies of the United States are agricultural and that the economies of most of our neighbors are largely agricultural. In Colombia, no less than in many other Latin American republics, agriculture dominates the domestic industry, the export trade, and the life of the people. The vital importance of Colombia in the development of economic solidarity of the Western Hemisphere rests largely upon its agricultural possibilities. It has the soil and climatic variety necessary to produce a great many of the tropical products which the United States needs, not only in the war emergency but for future development.

Other resources and potentialities, however, led the early Spaniards to Colombia and continue to attract modern adventurers. Since the days of the conquistadors, its mines have furnished an unending stream of yellow gold, and in recent years its oil wells have poured out quantities of "black gold" for export. It is rich in resources of platinum, silver, copper, mercury, and other minerals. Its forests produce rubber, tanning agents, insecticides, tagua, or vegetable ivory, and medicinal roots and herbs. Many species of rare and beautiful orchids grow wild in its forests. But towering above this mineral and forest wealth is the value of Colombia's agricultural production. Among its numerous crops coffee is outstanding, and furnishes the major source of income in the national economy.

Colombia has been called a land of contrasts. Snow-covered peaks can be seen from the steaming jungles of the coast country. Bananas of the tropical lowlands give way to fine coffee in the lower mountain ranges, and this in turn to wheat and corn on the highland sabanas. The culture of Bogotá, "the Athens" of South America, is in sharp contrast to that of the native Indians who still have an exceedingly low standard of living.

The wide variation in temperature enables Colombia to produce almost any crop within its borders. The commercial value of its tropical and semitropical products, however, far surpasses that of its temperate-zone crops. Its products complement those of the United States and provide the basis for a mutually profitable exchange of goods between the two countries. Although coffee is much the largest United States import from Colombia, the latter supplies many other items, such as divi-divi, barbasco, and tonka beans. Its rich resources make it a potential supplier of an even wider range of products, including rubber, manila hemp, copra, and pita fiber.

Colombia promises to develop into a rich production plant for the supply of tropical products especially suited to United States consumption.

LOCATION AND AREA

Colombia is in the northwestern corner of the South American Continent, one of the most advantageous spots in the world for trade with the United States. It has coast lines on both the Pacific and the Atlantic Ocean, and one of its main ports is only 266 miles from

the Panama Canal. The distance from Cartagena to New York is only 2,100 miles. The western boundary is 468 miles of Pacific Ocean from Ecuador to the Republic of Panama, and to the east of the Isthmus of Panama is a coast line of 641 miles on the Caribbean Sea. The position of Colombia on the South American Continent is shown in figure 1.

Colombia is a large country—equal in size to the Atlantic Coast States from Maine to Florida plus West Virginia and Ohio, and



FIGURE 1.—Location of Colombia.

larger than France, Germany, Belgium, and Switzerland together. The area is given as 439,828 square miles, although its exact size is not known. Border disputes have been settled with most countries, but the boundary with Venezuela is still in doubt. The country is 1,110 miles long and 800 miles wide at its widest point. It stretches from 12°24' north latitude to 4°17' south latitude.

TOPOGRAPHY

The mountains are the most important single factor influencing the climate, the social and cultural pattern, the transportation, and the economy of Colombia. They cut the western part of the country from the eastern plains and divide the western part into high peaks and low valleys (fig. 2). Through their influence on the climate

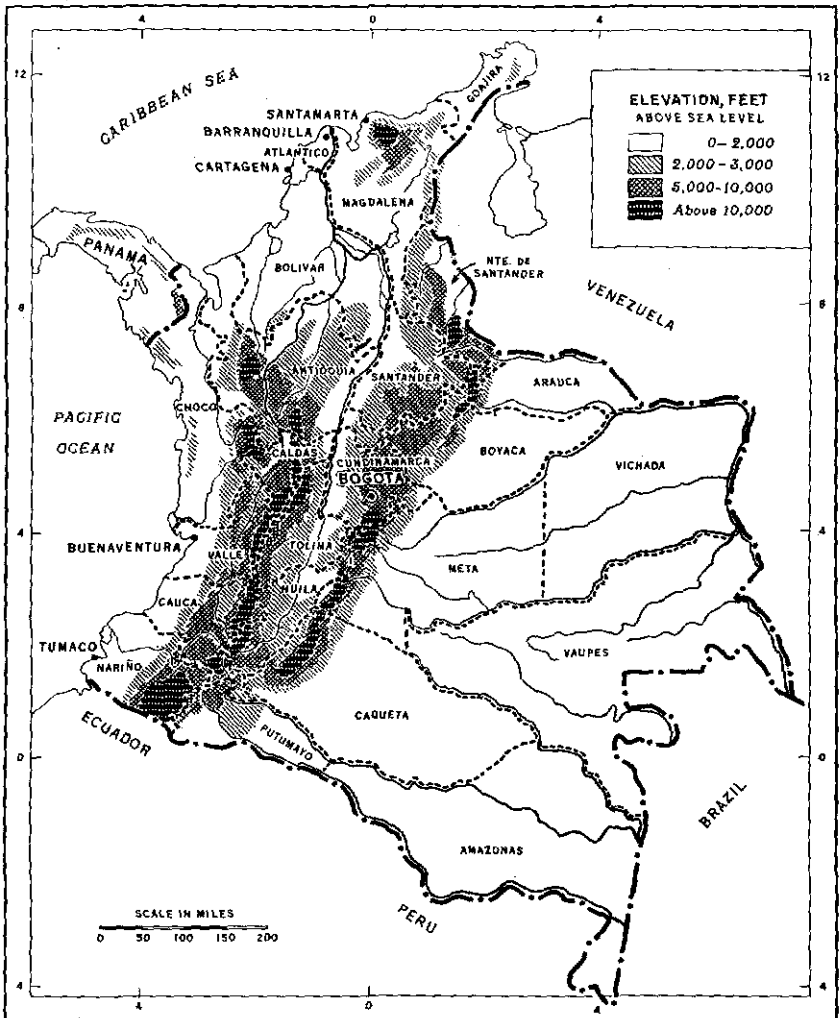


FIGURE 2.—Relief map of Colombia.

the mountains have determined that the major settlement of population should be in the rugged highland area. The health and vigor of the people there enable them to dominate the economic life of the country. The changing temperature zones from the lowlands to the highlands make a diversified agriculture possible. Bananas and sugar are produced in the lowlands, coffee on the lower slopes of the

mountains, and wheat and corn in the highlands. The diversification of the forest resources with changes in altitude and the presence of precious metals in the mountains increase the possibilities for economic expansion. However, the ranges are so high and rugged that they foster the development of distinct self-contained regions, since they limit the transportation from one part of the country to another. So difficult is it to travel from one valley to another that so-called biological islands have developed, with different plant and insect life in each.

The Andean Mountain system, which continues up through Colombia from the west-coast countries to the south, breaks into three great ranges at the Ecuadorean border. The three arms spread out fan-wise across western Colombia from south to north, forming the Western, Central, and Eastern Cordilleras. The central range, or backbone, has an average height of 12,000 feet, the peak of Tolima reaching 19,049 feet. The two large plateaus, Pasto and Popayán, provide room for settlements. There are two volcanoes in this central range near Pasto.

The Western Cordillera is not high in comparison with the Central—ranging only from 6,000 to 12,000 feet. The eastern range is somewhat higher, averaging 8,000 feet, with several high peaks in the south. About 700 miles south of the Caribbean this range broadens to form the Sabana de Bogotá. This plateau, 150 miles wide and 300 miles long, is 8,500 feet above sea level and is the most densely populated area in Colombia.

On the Pacific coast there is another low range of mountains, the Serranía de Baudó, which rises abruptly from the coast and extends from Panama to Bahía del Chocó. Separated from the Andean system and lying near the Caribbean Sea is another mountain range, the Sierra Nevada de Santa Marta, which runs east and west. The ranges are low in the Goajira Peninsula, but west of this, in the Santa Marta region, the snow-capped peaks rise to heights of almost 19,000 feet.

The mountains determine the river systems (34).³ In the north-western part of the country the rivers flow north between the mountain ranges, the major ones emptying into the Caribbean. In the eastern part of the country the rivers flow east to the Orinoco and southeast to the Amazon. The largest and most important river is the Magdalena, which originates far to the south where the Eastern and Central Cordilleras separate, and flows in the great valley between them to the Caribbean Sea. It is more than a thousand miles long, and together with its tributaries comprises the principal transportation system. Its largest tributary is the Cauca River, which flows through the narrow valley between the Western and Central Cordilleras and empties into the Magdalena about 200 miles from the Caribbean. Rivers flowing into the Pacific are small and short. Of these the Patía is the largest and the only one that has penetrated the Andean system to flow westward.

Almost two-thirds of the total area of Colombia lies east of the Eastern Cordilleras. The llanos, or grasslands, cover the northern part of the region, and the selvas, or dense tropical jungles, the southern part. This eastern area is drained by two great river

³ Italic numbers in parentheses refer to Literature Cited, pp. 143-144.

systems. Those in the northern half flow eastward to the Orinoco River in Venezuela, and those in the southern southeastward to the Amazon. The two watersheds are divided by a small range of hills.

CLIMATE AND RAINFALL

All Colombia is in the Tropics; nevertheless, it has wide variations in climate, from the heat and humidity of the coastal plains to the piercing cold of the snowy mountains. Temperature is a matter of elevation. The mountains divide the country into climatic zones, as follows: Tropical zone, from sea level to about 4,000 feet; subtropical zone on the lower hills, ranging from 4,000 to 7,500 feet; temperate-zone, or highland area, from 7,500 to 10,000 feet; and the páramos, or high Andean area, above 10,000 feet. Temperature varies little from season to season. Any seasonal climatic variations are due principally to variations in rainfall.

The mean annual temperature in the tropical zone is about 83° F. in the daytime and 75° at night, with little change from month to month. The zone itself is divided into several different climatic patterns. The coastal plains on both the Atlantic and the Pacific are hot and disagreeable, but there are differences in climate even on the coasts.

Rainfall is light on the northern coast; the annual fall at Santa Marta sometimes does not exceed 12 inches. In the banana region near Santa Marta the moisture is plentiful, ranging from 35 to 65 inches during April to July and September to November. Here the mean annual temperature varies from 72° F. at night to 89° during the day. On the whole Caribbean coast there is a well-defined wet and dry season, the wet season running roughly from June to November and the dry season from December to May.

Rainfall increases to the west, the Atrato Valley having almost constant precipitation. On the Pacific coast, also, rainfall is heavy and almost continuous the year round. In some places, including the major Pacific port of Buenaventura, it rains every day, and in the low regions the mean annual temperature ranges from 72° to 93° F. When the sun shines, the area is steaming and uncomfortable.

Inland from the coast, in the lower Magdalena Valley and the region around San Jorge and the lower Cauca River in Antioquia and Bolívar, the heat is more intense than on the coast. The temperature reaches 95° F. nearly every day, and there are two distinct seasons—the rainy from May to December and the dry from December to May.

The llanos and selvas to the east of the Andean ranges also come within the tropical zone. The selvas in the south have heavy rains from May until December and are covered with dense rain forests, which become swampy during the rainy season and are parched in dry weather.

Tropical heat is experienced in the regions up to about 7,000 feet, the mean annual temperature ranging from 93° F. during the daytime to 75° at night. The famous Cauca Valley has a tropical climate also, varying from 64° to 92°. Two dry and two wet seasons alternate: January, February, March, July, August, and September are dry; the other months are wet. Annual rainfall averages from 35 to 50 inches.

The subtropical region mean temperatures range from 75° F. in the daytime to 63° at night. Precipitation varies not only with altitude but with exposure, the western slope of the Central Cordilleras receiving from 45 to 75 inches of rain in heavy convectional showers. The famed coffee country is here, and the climate, especially in the Department of Antioquia, is that of perpetual spring.

The temperate zone includes the Sabana de Bogotá and other plateaus. The mean temperature on the plateaus ranges from 63° F. during the day to 40° at night. This zone receives about 40 inches of rain annually. The climate is cool here the year round, and the weather is not as good as that of northern New York State for growing crops. Corn requires 10 months to mature, and fruits grown here are small and have a low sugar content.

The páramos extend from 10,000 feet to the snow line. The area is perpetually cold, subject to light, frequent rains. Vegetation consists primarily of grasses and low bushes. Limited grazing is possible in some sections, but this region is otherwise useless for agriculture.

SOILS

Soil types also vary with altitude. Along the lowlands of the Pacific coast and in the Atrato Valley the fertile soils support dense mangrove swamps, which are useless for agriculture. Some of the higher coastlands and natural levees provide fertile strips of soil. The Mira and Patia Valleys, sloping toward the Pacific, have well-drained, clay loam soil suitable for sugar and cacao, and the San Juan Valley has red clay soil with good drainage.

In the lower Magdalena Valley soils range from sandy loam to heavy clay and are fertile and well-drained, suited to sugar cultivation. The plains around Cartagena and Barranquilla were built up from the mud deposited by the Magdalena River during overflows. The river's course has been changed slightly over the years, the small bodies of water have been cut off to form many tiny lakes, which could be used for irrigation. Along the river and to the east are brown to black sandy loam and clay soils, on which cotton grows readily. Farther down the river, these fine soils grow Pará and guinea grasses, corn, plantains, and bananas. The upper Magdalena has alternate stretches of stony, sandy areas and fertile areas of clay loam, brown to gray soils. To the east of the Magdalena lowlands rises the Sierra Nevada de Santa Marta. The lower elevations have fine sandy loam deposited by the mountain streams, ideal soil for banana cultivation. On the northern and western slopes of these mountains the soil is dark brown clay with abundant humus, and the subsoil is heavy red clay high in iron and potash. This region is one of the best natural locations for the development of coffee trees.

The soils of the beautiful Cauca Valley, which lies between the Western and Central Cordilleras, are of alluvial, or lacustrine, origin and consist of sandy loam to fine clay, light brown to gray in color, with a yellowish-gray subsoil. Some of the lower lands are poorly drained. The famous La Manuelita sugar hacienda is in this fertile valley. Sugarcane has grown on some of this land continuously for 90 years without fertilization. Irrigation is practiced here to obtain the best results.

From the valleys into the coffee country on the slopes of the Cordilleras the soils are fertile, of good depth, and high in potash and iron. The soils of the central mountain range are generally better than those of the others.

Farther up the slopes, on the sabanas around Bogotá the soils are fine loam to heavy clay, but of low fertility. Many temperate-zone crops are grown here, as well as many native fruits and vegetables.

Little is known of the soils in the large, almost uninhabited eastern llano and selva region, and there is much difference of opinion as to their fertility and possibilities for future development.

MINERAL RESOURCES

Colombia is rich in mineral resources, with emeralds, gold, petroleum, silver, copper, platinum, mercury, iron, lead, mica, salt, and coal. Gold was the source of the greatest mineral wealth until the last decade, when petroleum took the lead. The average value in recent years of exports of gold, petroleum, and platinum (listed below) indicates their relative importance, although gold exports also reflect balance-of-payment as well as commodity values.

| | <i>Average value, 1935-37 (1,000 pesos)</i> | <i>Average value, 1938-40 (1,000 pesos)</i> |
|----------------|---|---|
| Petroleum..... | 30, 819 | 36, 343 |
| Gold..... | 23, 908 | 33, 733 |
| Platinum..... | 2, 646 | 932 |

FOREST RESOURCES

Dense forests cover from 50 to 60 percent of the total area of Colombia (from 150 to 175 million acres), particularly in the eastern selvass and in the Pacific-coast regions. They are of four types: Mangrove swamps on the Caribbean coast; dry, thorn forests on the Goajira Peninsula; tropical jungles on the coasts and along the rivers up to an elevation of 5,000 feet; and oak, pine, walnut, and willow forests higher on the mountains. The forests contain large numbers of tagua palms (vegetable ivory trees, the nuts of which are used to make buttons); balatas (a type of rubber tree); ceibas (silk-cotton trees that furnish kapok); palms; copaiba; sapodillas (the source of chicle); balsams; dyewoods; and some rubber trees. They also contain medicinal plants, including cinchona, the source of quinine; rotenone-bearing roots, used as insecticides; tanning agents, such as divi-divi; and carnauba wax; as well as many varieties of rare and beautiful orchids. The jipijapa, a palmlike plant that grows wild in the forest regions, furnishes toquilla fiber for the manufacture of panama hats.

There has been no systematic exploitation of the forest resources. Very little is taken from the eastern forests except small quantities of wild rubber, which is floated down the Amazon in great black balls. The people of the coast regions gather tagua nuts, kapok, toquilla, wax, and other forest products in a desultory fashion, and some of these products have been exported in varying quantities.

During the nineteenth century considerable quantities of cinchona bark were exported, as well as some rubber. In the early 1900's

rubber constituted from 2 to 5 percent of total exports, tagua about the same, and straw hats from 2 to 6 percent. All of these have declined in relative importance, rubber, straw hats, and tagua together accounting for less than 1 percent of the total export value. All forest products together have made up less than half of 1 percent of the total value of exports recently, except in 1937, when they constituted only 0.52 percent of the total. The average export value of major forest products for the period 1934-40 is as follows:⁴

| | 1,000 pesos |
|---|-------------|
| Balsam..... | 111.2 |
| Divi-divi..... | 103.0 |
| Straw hats..... | 83.4 |
| Balata..... | 49.3 |
| Tagua..... | 45.7 |
| Total forest products (including straw hats)..... | 551.2 |
| Total exports..... | 162,833.0 |
| Forest products as percentage of total..... | .34 |

PEOPLE

The mountains of Colombia have had a tremendous influence on the people and where they live. Approximately three-fourths of the people live in the highlands and very few in the great eastern plains. Through their effect on climatic conditions, the mountains determine the vigor and energy of the people and the type of life they lead. Colombia has a population of nearly nine million people—a smaller population than that of the State of Pennsylvania. Population density for the country as a whole is less than 20 persons per square mile, but the people are so highly concentrated in certain areas, notably the “highland heart,” that this average figure has little meaning. Table 1, showing the population and area by administrative divisions and by sex for 1938, brings out very sharply the concentration of people in the regions of subtropical and temperate climates.

There are few cities in Colombia. Bogotá, the capital, is the largest, with 351,723 inhabitants. Medellín, Barranquilla, and Cali are the only others having a population of more than 100,000.

| | Popu- lation | | Popu- lation |
|-------------------|-----------------|------------------|-----------------|
| Bogotá..... | 351,723 | Cartagena..... | 84,937 |
| Medellín..... | 168,266 | Ibagué..... | 61,447 |
| Barranquilla..... | 152,348 | Cúcuta..... | 57,248 |
| Cali..... | 101,883 | Bucaramanga..... | 51,283 |
| Manizales..... | 86,027 | Pasto..... | 49,644 |

Colombia has more women than men, especially in the heavily populated sections. Women make up almost 56 percent of the Bogotá and Medellín population and over 57 percent of that in Bucaramanga. Many civil wars and rebellions until the early part of the twentieth century greatly reduced the male population. The total population, however, has shown a steady rise from 807 thousand in 1770 to 2.95 million in 1860 and 8.7 million in 1938, all without the aid of immigration, which has been negligible. Since 1926 the net immigration in any one year has not exceeded 4,600, and in 1930 there was a net emigration of over 5,000. The birth rate is comparatively high, 31.8 per thousand in 1938, as compared with 17.6 in the United States. The death rate

⁴ For the last three items the average is for 1934-39.

in 1938 was 17.2 per thousand in Colombia and 10.6 in the United States. Recently German and Austrian refugees have been settling near Cali. Many of these immigrants are traders and professional people, however, who do not fit into the agricultural economy of the region. As a result, immigration has been restricted.

TABLE 1.—Area and population of Colombia, by administrative divisions, 1938 census

| Administrative divisions | Area | Inhabitants per square mile | Population | | | |
|-------------------------------|---------------------|-----------------------------|---------------|---------------|---------------|--------------------|
| | | | Men | Women | Total | Urban ¹ |
| Department: | <i>Square miles</i> | <i>Number</i> | <i>Number</i> | <i>Number</i> | <i>Number</i> | <i>Percent</i> |
| Antioquia..... | 25,400 | 48.6 | 576,138 | 612,449 | 1,188,587 | 27.7 |
| Atlántico..... | 1,340 | 200.3 | 131,629 | 136,780 | 268,409 | 88.6 |
| Bolívar..... | 22,996 | 33.3 | 379,062 | 388,131 | 767,193 | 41.9 |
| Boyacá..... | 24,934 | 23.6 | 351,478 | 385,890 | 737,368 | 6.4 |
| Caldas..... | 5,162 | 149.1 | 395,150 | 374,818 | 769,968 | 32.1 |
| Cauca..... | 11,060 | 30.5 | 175,122 | 180,918 | 356,040 | 10.9 |
| Cundinamarca..... | 9,108 | 123.0 | 570,199 | 604,408 | 1,174,607 | 35.2 |
| Huila..... | 7,992 | 27.1 | 105,964 | 110,722 | 216,676 | 24.7 |
| Magdalena..... | 20,819 | 16.4 | 173,286 | 169,036 | 342,322 | 43.6 |
| Nariño..... | 11,548 | 40.3 | 223,250 | 237,618 | 460,868 | 16.6 |
| Norte de Santander..... | 8,297 | 41.7 | 172,095 | 174,086 | 346,181 | 25.4 |
| Santander..... | 12,882 | 49.7 | 305,626 | 310,084 | 615,710 | 19.2 |
| Tolima..... | 8,877 | 61.7 | 278,578 | 269,218 | 547,796 | 21.8 |
| Valle..... | 8,086 | 75.8 | 315,827 | 297,403 | 613,230 | 43.8 |
| Departments total..... | 178,610 | 47.1 | 4,168,394 | 4,243,861 | 8,407,955 | 29.8 |
| Intendencias: | | | | | | |
| Amazonas..... | 48,008 | .13 | 3,929 | 2,485 | 6,414 | 26.1 |
| Chocó..... | 17,981 | 6.2 | 55,797 | 55,419 | 111,216 | 9.0 |
| Meta..... | 32,903 | 1.6 | 28,897 | 22,777 | 51,674 | 16.1 |
| San Andrés y Providencia..... | 21 | 310.8 | 3,135 | 3,393 | 6,528 | |
| Intendencias total..... | 98,913 | 1.8 | 91,758 | 84,074 | 175,832 | 11.4 |
| Comisarias: | | | | | | |
| Arauca..... | 9,973 | 1.1 | 5,679 | 5,477 | 11,156 | 16.8 |
| Caquetá..... | 39,764 | .5 | 11,628 | 9,286 | 20,914 | 19.9 |
| Guajira..... | 4,726 | 11.3 | 27,767 | 25,652 | 53,409 | |
| Putumayo..... | 10,221 | 1.5 | 8,549 | 7,139 | 15,688 | |
| Vaupés..... | 57,857 | .13 | 4,192 | 3,375 | 7,567 | |
| Viçhada..... | 39,764 | .23 | 4,806 | 4,288 | 9,094 | |
| Comisarias total..... | 162,305 | .73 | 62,611 | 55,417 | 118,028 | 5.1 |
| Total Colombia..... | 439,828 | 19.8 | 4,312,763 | 4,389,052 | 8,701,815 | 29.1 |

¹ Urban classification includes all towns having more than 1,500 people.

Data from official Colombian sources (5, p. 3, No. 2, Sup., 7).

There are varying estimates of the percentage of whites, Negroes, and Indians in the population, the estimates for whites running from 10 to 35 percent of the total. The higher figure probably includes many mestizos, a mixture of white and Indian, since the general tendency is to consider a person white unless he is distinctly different in racial characteristics. Assimilation of the Indians and, to a lesser extent, of the Negroes has proceeded rapidly. The following distribution gives some indication of the relative percentage in each classification (35):⁵

| | Percent |
|----------------------------|---------|
| White..... | 10 |
| Indian..... | 10-15 |
| Negro, mulatto, zambo..... | 30-35 |
| Mestizo..... | 30-50 |

⁵ Zambos are a mixture of Negro and Indian.

The whites and mestizos are concentrated largely in the highland regions where the climate is temperate. Negroes, most of whom are descendants of slaves brought in during the colonial period, live in the hot coastal plains, where the white men and Indians do not thrive. In the Pacific port of Buenaventura 90 percent of the population are Negroes. Indians are scattered throughout the country: Some warlike, independent tribes live in the Goajira Peninsula; the descendants of the Chibchas inhabit the Sabana de Bogotá; and uncivilized Indians roam the eastern plains and isolated areas. In some places the uncivilized Indians are exempt from the ordinary laws of the Republic and are under the administration of missions.

The estimated working population is 4.5 million, 3.3 million of whom are engaged in agricultural, pastoral, and forest industries. Processing industries employ some 527,000; service industries, 377,000; extraction industries, 54,000; and the petroleum industry, 18,000 (5, v. 3, No. 4).

Spanish is spoken by almost everyone except the isolated Indian tribes. Illiteracy among all but the higher classes is very high, estimates running as high as 75 percent of the population. Primary-school education is free for those between 6 and 14. The five universities in Colombia are open only to men. The church has opposed higher education for women, and the most advanced training available to them prior to 1934 was a private school in Barranquilla. After the election of López in 1934 there were many reforms, including the opening of preparatory schools for women. Education was taken from church control, and public welfare was made a state function.

The standard of living of the great majority of people is low, with consequent ill effects on health. Impure water, inadequate food, poor sewage disposal, and lack of refrigeration foster the development of hookworm, malaria, anemia, and other diseases, especially in the lowlands. Of the 1,610,036 housing establishments listed in the census of 1938, only 265,372 had any modern conveniences whatever. The Colombian Government has been interested in the problem of malnutrition for many years, and local governments and private individuals made some effort to establish school restaurants as far back as 1914. The central Government made a grant to the Departments in 1935 of 160,000 pesos for such use. The grant was increased to 600,000 in 1936, reduced to 400,000 in 1938, and raised to 450,000 in 1939. About 700 school restaurants were in operation in 1938, in addition to 350 nutritional cooperatives.

There were in 1938 only 39,283 telephones in the whole country, all of which were listed in the urban areas; telegraph lines totaled only 22,600 miles; and fewer than 14,500 automobiles were registered.

The area is divided politically into 14 Departments, 4 Intendencias, and 6 Comisariás. Intendencias and Comisariás are territories that have not attained the status of Departments. The relative size and population of these divisions are given in table 1.

MANUFACTURING INDUSTRIES

Colombia is not an industrial nation, and the industries it does have are practically all for the production of consumer goods. There is a wide variety of manufacturing plants, including cotton and woolen mills, shoe factories, ice plants, soap-, candy-, bottle-, and tobacco-

manufacturing plants, and breweries. Recently manufacturing has increased 50 to 80 percent under the stimulus of a high protective tariff. It is estimated that factories employ about 300,000 skilled laborers and support 1.5 million people.

Manufacturing is centered in the highlands, particularly in the cities of Medellín, Manizales, and Bogotá. Half of the 1,378 principal industries listed in 1939 were in the three Departments of Cundinamarca, Antioquia, and Atlántico. There are a number of sugar mills in Valle, Cauca, and Bolívar, and several mountain towns are important centers for the production of panama hats, sandals, and clothing made by hand.

The value of domestic production is greatest in the fields of textiles, flour milling, and tobacco manufacture (table 2). Raw materials for domestic industry are obtained from local production and from imports. Three-quarters of the value of the raw material for textile manufacture comes from outside the country, whereas two-thirds to three-quarters of the value of the raw material for flour milling, tanning, tobacco manufacture, and biscuits and confectionery making comes from local production. The domestic production of the articles manufactured is not sufficient to take care of the needs of the market; in a representative group of these industries, it is still necessary to import 35 percent of total requirements.

TABLE 2.—*Value of domestic production and imports, wages and salaries paid, and fixed-capital investment of selected Colombian industries, 1938*

| Industries | Domestic production | Imports | Wages and salaries paid | Fixed-capital investment |
|--------------------------------|---------------------|---------------|-------------------------|--------------------------|
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Textile..... | 15, 004 | 21, 712 | 3, 587 | 12, 797 |
| Flour milling (wheat)..... | 10, 789 | 80 | 386 | 3, 254 |
| Cement..... | 2, 388 | 760 | 439 | 6, 084 |
| Tanning..... | 1, 560 | 1, 156 | 247 | 871 |
| Sugar..... | 4, 670 | 1, 387 | 739 | 11, 671 |
| Cigar and cigarette..... | 18, 638 | 836 | 2, 108 | 4, 383 |
| Biscuit and confectionery..... | 805 | 475 | 135 | 701 |

Ruis, Carlos Arenas (23).

TRANSPORTATION

It is on transportation that the mountains have had their greatest influence. The Andean ranges are so lofty and the few so-called passes are themselves so high (10,000 to 12,000 feet) that construction of railways and highways across them is both difficult and costly. The whole eastern llano and selva region is cut off by the mountains from the rest of the country and also from an outlet to the sea. The rivers that flow between the ranges furnish an outlet for the interior valleys, but communication between the valleys across the peaks of the Andes has been practically impossible. Solution of the transportation difficulties in Colombia would provide a key to the rich storehouse of the highland country and the eastern plains. The airplane is the only rapid means of travel. Colombia was the first country in South America to develop air service within the Republic, probably because of the inaccessibility of its capital city by other means of transportation. It was necessary to use both river and railway to reach the capital prior to the establishment of regular air service by Scadta in 1920.

The Magdalena River, with its 500 tributaries, has been the heart of the transportation system of the country since colonial days. It affords over 2,500 miles of more or less navigable waterways. The northern part of the river is broad and strong, a mile wide at high water. In the dry season, from December to April, however, its mouth is a swampy delta where only small boats can navigate, and farther up it is shallow and bar-clogged. Traffic moving south up the river must be transferred to a railway at La Dorada to go around the rapids and reloaded on small river steamers to continue the journey on the river. The journey from the Caribbean to Bogotá by rail and river requires five or six transfers and a minimum of 7½ days' travel, which stretches



FIGURE 3.—Potatoes being transferred from pack animals to truck at interior shipping point.

out to many weeks in the dry season. The cost of moving a ton of merchandise this 800-mile distance runs from \$60 to \$75 a ton, about 10 times the all-rail cost from New York to Chicago. To supplement the river transportation there are some railways and highways, but even today the most common method of reaching the river, railway, or highway is by mule pack (fig. 3), oxen, and llamas across narrow mountain trails. Some of these trails were built by the Incas before the Spanish conquest and are still the best trails in Colombia. The old Inca trail from the southern part of the continent to the sea crossed Colombia, from Quito, Ecuador, to Popayán and down the Cauca Valley to Cartagena. The Spanish settlers as far south as Argentina continued to use the road for ocean-bound commerce until the end of the eighteenth century.

The railways that are in operation are all short lines and are of three different gages. The first road built was the Panama Line in 1855. It is not within the present territory of Colombia. The plan for building a road in Colombia proper was initiated in 1848, but it was not completed from the Pacific port of Buenaventura to Cali, a

distance of about 50 miles, until 1914. In 1938 there were only 2,039 miles of railway, concentrated largely in the Magdalena Valley. The following tabulation indicates the increase in trackage between selected years.⁶

| | <i>Miles</i> |
|------------|--------------|
| 1890 | 202 |
| 1900 | 270 |
| 1921 | 939 |
| 1930 | 1,767 |
| 1938 | 2,039 |

No railways run from the Caribbean to the highlands, although railways connect the major cities with ports on the Magdalena River. Railways connect the Pacific coast at Buenaventura with cities in the



FIGURE 4.—One-way road between Popayán and Pasto. Traffic is being held up because one of the forward trucks has broken down.

Cauca Valley. From Armenia to Ibagué, a motor-car connection is provided with the Girardot-Tolima-Huila Railway to Bogotá, so that the capital may now be reached from the Pacific coast by rail and motor car in less than 2 days. Today Colombia may be likened to the eastern United States of 1810 to 1830, before the era of the railroads.

Cableways are important transportation links in some mountain regions, although their total length is not great—in 1938 it was 88.2 miles, mostly in the Department of Caldas. The ropeway connecting Mariquita with Manizales is the longest one in the world. From the port of Gamarra, basket cars swing passengers and freight up to Ocaña on top of the mountains.

As a rule the highways have paralleled the railroads, competing with the rails for traffic rather than complementing them to furnish a more adequate transportation system. Because of the rugged topography, it costs as much to build a road as a railway, and the maintenance cost

⁶ PAN AMERICAN UNION. AN OUTLINE OF COLOMBIAN ECONOMY. *Com. Pan. Amer.*, No. 80, 20 pp. 1939. [Mimeographed.]

is greater (fig. 4). In 1938 there were 7,668 miles of highway in Colombia, including both national and departmental roads, with another 1,737 miles under construction. The largest mileages are in the Departments of Antioquia, Boyacá, Cundinamarca, and Santander.

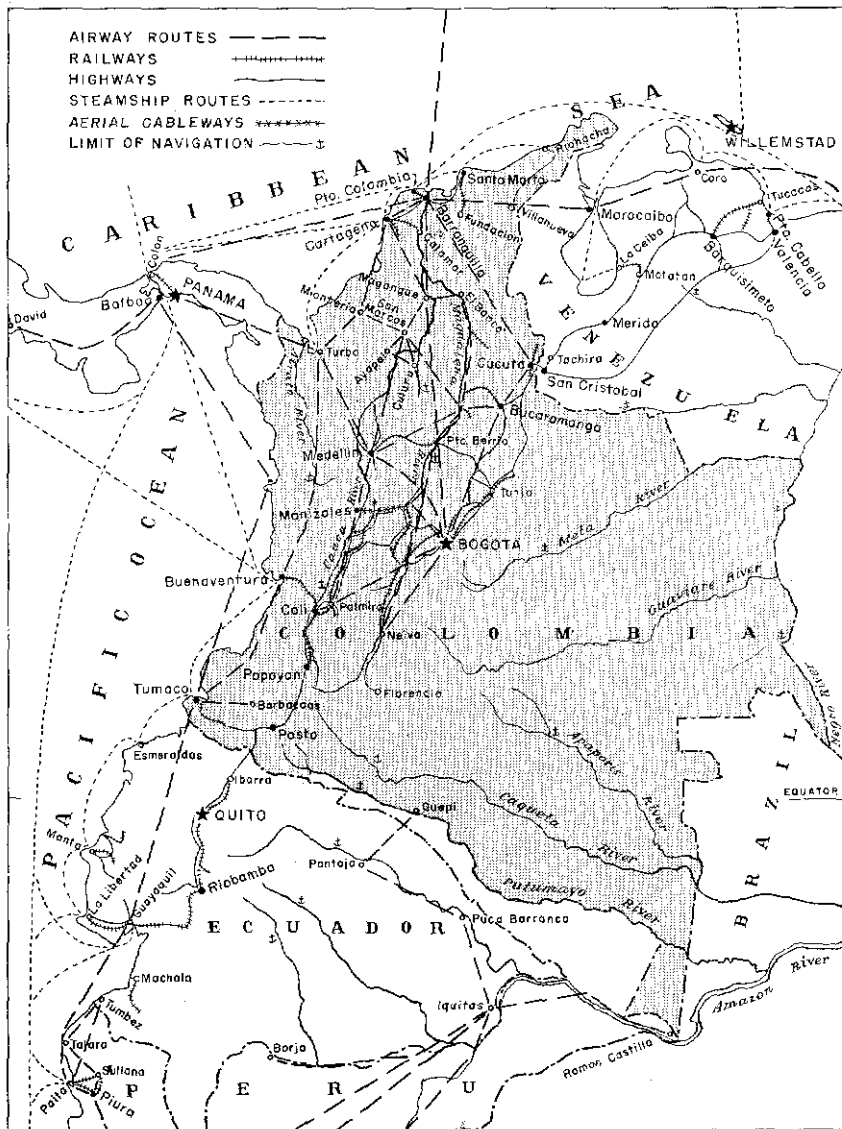


FIGURE 5.—Chief transportation routes of Colombia.

There are no roads whatever in the Goajira Peninsula and the Comisaría of Vichada.

The only modern overland route between Venezuela and Colombia is the Caracas-Bogotá Highway. The highway also extends from

Bogotá via Ibagué through the Cauca Valley to the border of Ecuador. In 1938 there were only 14,500 automobiles operating in the country, 2,867 autobuses, and 7,013 trucks.

Figure 5 shows the main transportation routes and indicates the inaccessibility of the eastern llanos and selvas. A commission was established in 1929 to study the problem of providing adequate transportation. A comprehensive program was outlined, and some progress has been made since then. The physical difficulties, however, make construction and maintenance of railways and highways very difficult and costly.

Good steamer service is available from both the Atlantic and the Pacific coasts. Cartagena, Santa Marta, and Barranquilla are the Caribbean ports of call and Buenaventura and Tumaco the Pacific ports, Buenaventura having one of the best natural harbors on the continent. Air service to the United States is regular and rapid.

Most freight moves by river boat and steamer, and a good part of the passenger travel is by air. Colombia may progress from water to air transportation for both freight and passengers, omitting the period of railroad development that characterized transportation evolution in the United States. If peaceful world conditions return in a reasonably short time, there will be a tremendous excess of airplanes, which could be used to build a rapid and economical transportation system in South America for freight as well as people and to promote the development of areas now almost inaccessible to the rest of the world.

HISTORY, DEVELOPMENT, AND PRESENT STATUS OF AGRICULTURE

The hot climate of the lowlands and the fear of attack by corsairs sailing along the coast favored early settlement in the upland plateaus, where the rural population is still largely concentrated. The land in the new country, particularly in the highlands, was given to the conquistadors by the Spanish Crown in large blocks or grants, known as *encomiendas*. These blocks of land became hereditary and passed down from father to son in unbroken lots. As time went on, the owners lived more and more in the cities and abroad, and a system of absentee landlordship grew up. Along with the original grant of land went the Indians already living there, and a vast feudal manor was created. Until the beginning of the twentieth century, practically all of the ordinary laborers in the country were either *peons* or *rotos*. The *peons* were peasants who belonged to the land and had an obligation to its owner; the *rotos* were roving laborers, not settled in any one place.

In the latter part of the eighteenth century, negro slaves were imported to work in the mines and on the large estates. Gradually they became concentrated in the coast regions and in the banana fields of Santa Marta.

Under Spanish rule, heavy taxes were placed on wheat, sugar, cacao, and hides, and commerce was greatly restricted. With the coming of independence, commerce developed somewhat, although mining still was the major industry. The people were supported by exploitation of raw materials from the mines and forests and, to a less extent, the soil. Agricultural exports in 1875 were valued at

10 million dollars and consisted of cinchona, tagua, hides and skins, tobacco, indigo, and cotton, in addition to the important gold exports. From 1850 to 1875 people began to move down from the plateau regions to the valleys and lower hillsides to grow mild coffee for the European market, and coffee soon became the most important product in the economy. The cattle-raising industry was expanded, and foreign interests began to grow bananas in the Santa Marta region. The first important shipment of bananas was made in 1892, and the industry grew rapidly.

ECONOMIC IMPORTANCE

The economy of the country is now largely agricultural and is tied very closely to the coffee industry, which provides the major commercial product. Since only a small proportion of the coffee produced is consumed within the country, the exportation of this commodity is an important factor in the welfare of the country. Seventy percent of the total population is rural, and of the total working force of 4.5 million in 1938, 73.3 percent were engaged in agriculture or grazing.

No data are available on the total capital investment in agriculture, but some indication of its importance in the economy is shown by the following data: The export value of coffee alone in 1938 was approximately 50 million dollars, as compared with a total capital investment in the major manufacturing industries of about 39 million dollars. Corn was the next most valuable product, the total harvest being valued at 15 million dollars in that year. The value of several major agricultural products in 1937-38 is given in appendix table 42.

TABLE 3.—Agricultural exports from Colombia in percentage of total value, selected years

| Year | Coffee as percentage of— | | Bananas as percentage of— | | Total coffee and bananas as percentage of— | | Agricultural products ¹ as percentage of— | |
|------|--------------------------|-------------------|---------------------------|-------------------|--|-------------------|--|-------------------|
| | Total value | Merchandise value | Total value | Merchandise value | Total value | Merchandise value | Total value | Merchandise value |
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| 1916 | 31.0 | 38.3 | 5.4 | 11.6 | 40.4 | 49.9 | | |
| 1915 | 51.4 | 59.9 | 6.3 | 7.4 | 57.7 | 67.3 | | |
| 1919 | 63.7 | 69.0 | 2.8 | 2.8 | 71.5 | 71.8 | | |
| 1925 | 78.4 | 79.9 | 6.6 | 6.7 | 85.0 | 86.6 | | |
| 1929 | 60.6 | 63.2 | 7.0 | 7.0 | 67.6 | 70.2 | 68.0 | 70.9 |
| 1935 | 55.5 | 64.1 | 6.3 | 7.2 | 61.8 | 71.3 | 62.1 | 71.7 |
| 1936 | 58.3 | 67.2 | 5.2 | 6.0 | 63.5 | 73.2 | 63.7 | 73.5 |
| 1937 | 53.8 | 65.2 | 3.8 | 4.6 | 57.6 | 69.8 | 57.9 | 70.1 |
| 1938 | 54.4 | 61.5 | 5.4 | 6.2 | 59.8 | 67.7 | 60.6 | 68.5 |
| 1939 | 49.2 | 63.8 | 4.9 | 6.4 | 54.1 | 70.2 | 54.7 | 71.0 |
| 1940 | 44.5 | 59.4 | 3.4 | 4.5 | 47.9 | 63.9 | | |

¹ Not strictly comparable throughout because of change in classification. Pan American Union (23, 24, 25).

For 60 years agricultural products have constituted the bulk of exports. The two products, coffee and bananas, are by far the most important items that enter trade. Together they have accounted for from 40 to 85 percent of the total export value. When only merchandise exports are considered, the proportion represented by these two commodities is increased. Table 3 shows the percentage of

total export value and merchandise value of these two products for selected years.

Colombia ranks second to Brazil in supplying world coffee, and first in furnishing mild coffee. Fifteen percent of world exports of coffee and from 5 to 10 percent of world exports of bananas originate in Colombia.

LAND POLICIES

Colombia has vast areas of untilled land owned by the Government. They are located along the coast, in the Department of Bolívar, in the eastern llanos, and in the region of the Amazon River. These lands are known as baldíos (commons) and cannot be sold outright by the Government. It is possible, however, to adjudicate them in perpetuity. In the past when anyone wanted to settle in these regions he "occupied" the public land not already settled. By cultivating it or stocking it with cattle, the occupant obtained a prior claim over other applicants. He was required to cultivate at least one-third of the land for 10 successive years or pasture animals on at least two-thirds. To obtain absolute title he had to make payment for the land in territorial bonds or special certificates. It was also possible to make direct application for some parcel of land by filing the application in various public offices. Full ownership was acquired when the application was approved and payment made in the bonds.

The titles to certain lands became more and more tangled, and there was much confusion regarding purchase, sale, and use of certain areas. In 1936 an attempt was made to straighten out the difficulties, and a new landownership law went into effect in December of that year. The new law recognizes the validity of private ownership of rural lands if the owner can present an original grant by the State of a registered title issued prior to the effective date of the law. The law states that all other rural land shall be either public land or private property, depending on whether or not it is "possessed" by private individuals. "Possession" is defined as "economic exploitation through positive acts consistent with ownership," such as planting and seeding, use for livestock, forestry, etc. "Economic exploitation" must have been exercised continually for 10 years. The law, however, protects the rights of persons who have settled on land they believed to be public land and have cultivated it continually for 5 years prior to the passage of the new law.

The new law authorizes the Government to designate areas for preservation and replanting of forests to conserve the flow of water, prohibits the cutting of forests that conserve water flow, and authorizes the Government to designate forest reserves and regulate the industrial utilization of forest products. The Government may determine areas where mining activities might prevent the economic use of the land as defined in the act and may exempt such lands from the application of the law.

ORGANIZATION OF THE INDUSTRY

The topography of Colombia is again brought to the attention by the agricultural pattern of the country. The mountain ranges divide the country into biological islands with different plant and

insect life in each area; the elevation determines the climatic conditions; and the growing conditions differ as between one elevation and another and one valley and another. The extremely difficult task of moving products from one region to another has tended to develop regional self-sufficiency in the production of staple foodstuffs, even though there is certain specialized production for commerce suitable to particular regions. With the varied climatic and soil conditions, it is possible to have tropical, subtropical, and temperate crops in different parts of the country.

There is probably a greater wealth of plant species in Colombia than in any other area of comparable size in the Western Hemisphere. Many are native plants that have not been cultivated but that offer attractive possibilities for development.

LAND UTILIZATION

An accurate statement on the amount of land actually under cultivation or capable of being cultivated is not now available. Neither are figures available on the distribution of the total land area. Estimates indicate that forests cover 150 to 175 million acres of land, or from 50 to 60 percent of the total land area. At least 2.5 million acres (about 1 percent) are in oil concessions, although parts of this area may be under cultivation and so be included in the data on area cultivated. Large grazing areas occupy approximately 65 million acres. About 50 million acres in the eastern llano region are covered with natural grasses. The total area in the 12 principal crops in 1937-38 was 4,443,000 acres, or only 1.6 percent of the total land area. (See appendix table 43.)

It is estimated that land utilization is as follows:

| | <i>Percent</i> |
|--|----------------|
| Forest or woodland..... | 50-60 |
| Grazing lands..... | 23 |
| Eastern grasslands (included in grazing land)..... | 17 |
| Oil concessions..... | 1 |
| Cultivated area..... | 2 |
| Unknown..... | 15-25 |

The three Departments of Cundinamarca, Antioquia, and Boyacá contain 42 percent of the cultivated area, and the Intendencias and Comisarías account for less than 1 percent. The whole section east of the mountain ranges, containing 167 million acres, or 59 percent of the total area, had only 30,000 acres planted to the 12 principal crops. The 14 Departments, covering 114 million acres, cultivated 4,413,000 acres, or 3.9 percent of the total land area (table 4).

The Department of Cundinamarca cultivates 12.7 percent of its land in these 12 crops. Most of the acreage is in wheat, corn, sugar, and coffee. Caldas, the large coffee producer, cultivates 11.2 percent of its land, and Atlántico 9.3 percent. Only 1.8 percent of the area of Magdalena is cultivated, half of it in bananas.

Vast areas now covered by woodland and grasses have favorable climate and soils and are suitable for cultivation. Opinions vary regarding the fertility of the eastern llanos and selvas, but without doubt they offer a possibility for future development as soon as the problems of transportation and living conditions can be solved. Fertile lands are now available for use, especially in the Cauca Valley, the Tolima Valley, and the northern plains section.

TABLE 4.—*Estimated area cultivated in 12 major crops in Colombia, 1937-38*

| Administrative division | Estimated area in 12 major crops | Area in 12 major crops as proportion of— | |
|----------------------------------|----------------------------------|--|-----------------------------|
| | | Total area of division | Cultivated area of Colombia |
| Department: | <i>1,000 acres</i> | <i>Percent</i> | <i>Percent</i> |
| Antioquia..... | 598 | 3.7 | 13.5 |
| Atlántico..... | 81 | 9.3 | 1.8 |
| Bolívar..... | 239 | 2.3 | 7.6 |
| Boyacá..... | 515 | 3.2 | 11.6 |
| Caldas..... | 370 | 11.2 | 8.3 |
| Cañuca..... | 144 | 1.9 | 3.2 |
| Cundinamarca..... | 740 | 12.7 | 16.7 |
| Huila..... | 100 | 2.0 | 2.2 |
| Magdalena..... | 245 | 1.8 | 5.5 |
| Nariño..... | 264 | 3.6 | 6.0 |
| Norte de Santander..... | 137 | 2.6 | 3.1 |
| Santander..... | 297 | 3.7 | 6.7 |
| Tolima..... | 291 | 5.1 | 6.6 |
| Valle..... | 292 | 5.6 | 6.6 |
| Total..... | 4,413 | 3.9 | 99.4 |
| Intendencias and Comisarías..... | 30 | .02 | .6 |
| Total Colombia..... | 4,443 | 1.6 | 100.0 |

Basic data for calculations are taken from official Colombian sources (7, 12).

NUMBER AND SIZE OF FARMS

The number and size of farms in Colombia are not known. Some indication of the number and relative value can be obtained from a tax list of property, showing the number of taxable farms, or fincas, and their tax valuation, in which those privately owned are classified as rural or urban.

For 1939, 701,420 rural fincas are listed, with a total taxable value of 529 million dollars, or an average of 754 dollars per finca. This compares with an average of 1,232 dollars for the urban fincas. Appendix table 44 shows the break-down of the rural valuation by Departments. Cundinamarca has about 10 percent of the total taxable value—the highest of any one Department—but the average value of rural fincas in the Department of Caldas is the highest, with those in Antioquia and Valle next.

The data given below are for certain of the major crops, showing the number of farms on which those crops were grown in 1937-38 (7). The figures for the separate crops cannot be added together to obtain a total for the country, since more than one of these crops may be grown on the same farm.

| | <i>Number of farms</i> | | <i>Number of farms</i> |
|----------------|------------------------|--------------|------------------------|
| Coffee..... | 164,611 | Wheat..... | 55,666 |
| Corn..... | 258,734 | Tobacco..... | 13,263 |
| Beans..... | 98,474 | Rice..... | 11,635 |
| Potatoes..... | 77,051 | Cacao..... | 7,989 |
| Sugarcane..... | 65,665 | Cotton..... | 4,859 |

The tax list does not give any clues as to size of holdings. It is known, in general, that the holdings in Cundinamarca, on the plateau, are large—having come down in unbroken lots from generation to generation from the original grants to the conquistadors. Other Departments have a few large holdings (table 5), but, generally

speaking, the farms are small—in some cases too small to support the family living on them. In the Santa Marta banana district, the Magdalena Fruit Company has large holdings, although even here there are considerable numbers of small private growers.

TABLE 5.—Average area in farms on which four of the major crops in Colombia are cultivated, 1937-38

| Department | Cacao | Wheat | Cotton | Rice |
|-------------------------|--------------|--------------|--------------|--------------|
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> |
| Antioquia..... | 279 | 62 | 63 | 140 |
| Atlántico..... | | | 156 | 192 |
| Bolívar..... | 224 | | 165 | 142 |
| Boyacá..... | 223 | 24 | 26 | 189 |
| Caldas..... | 228 | 226 | 919 | 22 |
| Cauca..... | 55 | 32 | 160 | 167 |
| Cundinamarca..... | 95 | 45 | 263 | 105 |
| Huila..... | 288 | | 247 | 339 |
| Magdalena..... | 9 | | 141 | 84 |
| Nariño..... | 115 | 51 | | 120 |
| Norte de Santander..... | 64 | 119 | 32 | 57 |
| Santander..... | 275 | 26 | 184 | 734 |
| Tolima..... | 246 | 250 | 1,603 | 575 |
| Valle..... | 53 | 356 | 1,187 | 500 |
| Department average..... | 121 | 36 | 148 | 198 |

TYPE OF FARMING

Agricultural crops are produced both for export sale and for home use. Farms producing commercial crops also grow food for their workers, and many small plots are devoted entirely to subsistence farming. Subsistence agriculture is generally extensive and commercial production intensive, although these terms cannot be applied as explicitly to Colombian agriculture as they can to the agricultural production of the United States. High-cost spraying and irrigation equipment in the banana fields is forcing a more intensive use of the land there than formerly. A few years back, older producing areas were abandoned and production started on new territory. This practice is still used to some extent but in a much more limited area.

REGIONAL DISTRIBUTION

The topography of Colombia has produced many regions of agriculture, through its effect on climate and transportation facilities. There are, however, four general agricultural areas:

(1) The tropical region, including the Atlantic and Pacific coasts and the Magdalena Valley as far south as Girardot. Although the eastern plains and forests are tropical in climate, they are not yet important agriculturally. Commercial banana cultivation is on the Atlantic coast and in the Magdalena Valley. Other important north-coast products include cotton and sugarcane. Corn and rice are grown for home use, and some cacao and vegetable ivory, or tagua, are produced or collected. Cattle graze on the plains south of the Sierra Nevada and along the riverbanks. This region produces some coconut palms, tonka beans (used in making a cheap vanilla extract, in perfumes, and in scenting tobacco), sapodillas (large brown fruit with sweet brown flesh), grapefruit, limes, mangoes, papayas, and avocados.

These are not now commercially important but may develop into profitable production.

There is not much commercial agriculture along the Pacific coast, although the region does produce some rubber and tagua for trade. Some sugarcane, rice, and cotton are grown there, but cultivation is haphazard and primitive. The natives raise plantains, corn, yuca, and a few hogs for local consumption.

(2) The Cauca and Tolima Valleys. The Cauca Valley is one of the best agricultural regions in the world. It is especially suited for the production of cotton, sugarcane, and cacao. The higher lands on either side of it produce excellent coffee. The valley has good grazing lands, and in the past the people there were more interested in grazing than in the cultivation of crops. However, lately they have begun to recognize the possibilities of expanding production.

The Tolima Valley is suited to the production of cotton, tobacco, and rice, as well as coffee. Semitropical fruits can be grown, such as limes, grapefruit, pineapples, sapodillas, avocados, and mangoes.

(3) Land from 4,000 to 7,500 feet above the sea. These areas specialize in the production of Colombian mild coffee. Each coffee finca, however, produces also some corn, yuca or cassava, beans, and some temperate-zone vegetables. Cattle grazing is highly developed, especially around Medellín. This elevation is particularly favorable for cacao, quinine, digitalis, and tea.

(4) Land at an elevation of 7,500 to 10,000 feet, including the Sabana de Bogotá, parts of Boyacá, and Santander. Some coffee is grown here as well as many temperate-zone products, including wheat, barley, potatoes, apples, pears, and peaches. Fine cattle are raised on the Sabana de Bogotá.

CROP DISTRIBUTION AND COMPETITION

Climatic and soil conditions pretty well limit producing regions for some crops. There is not much competition as yet between crops for the use of the same land, although a thorough study of the relative advantages of growing one crop as against another in certain localities might provide the basis for a change in land use. It might be found that land now being used for cotton could more advantageously be devoted to sugarcane, coconut palms, manila hemp, or tropical and semitropical fruits; or that land in wheat might better be used for forest or orchard crops that conserve the soil.

Table 6 shows the production of major crops by Departments (see also appendix table 43).

EQUIPMENT AND LABOR

Agricultural equipment in Colombia is meager. Prior to 1934, agricultural machinery was used very little in the cultivation of any crop. Since then, the Government has been actively encouraging the development of self-sufficiency in foodstuffs, and the large cultivators of rice, cotton, wheat, barley, corn, and potatoes have turned more and more to the use of machinery. The efforts of the central Government recently to encourage expansion in the production of agricultural products have also resulted in increased use of machinery, especially in connection with the Government experiment sta-

TABLE 6.—Production of major crops in Colombia, 1937-38

| Administrative divisions | Coffee | Bananas | Corn | Sugar ² | Wheat | Beans | Potatoes | Rice | Cotton ³ | Cacao | Tobacco | Fique ⁴ |
|----------------------------------|--------------------------------|------------------|------------------|--------------------|------------------|------------------|------------------|------------------|---------------------|------------------|------------------|--------------------|
| | <i>1,000 bags</i> ⁵ | <i>1,000 lb.</i> | <i>1,000 bu.</i> | <i>1,000 lb.</i> | <i>1,000 bu.</i> | <i>1,000 lb.</i> | <i>1,000 bu.</i> | <i>1,000 bu.</i> | <i>1,000 lb.</i> | <i>1,000 lb.</i> | <i>1,000 lb.</i> | <i>1,000 lb.</i> |
| Department: | | | | | | | | | | | | |
| Antioquia..... | 771 | | 3,828 | 182,664 | 4 | 30,450 | 847 | 288 | 478 | 2,064 | 3,065 | 3,109 |
| Atlántico..... | | | 331 | 9,903 | | 179 | | 45 | 13,714 | | | |
| Bolívar..... | | | 2,119 | 91,628 | | 1,625 | | 2,440 | 3,894 | 181 | 9,678 | |
| Boyacá..... | 23 | | 1,703 | 49,799 | 1,208 | 2,814 | 2,588 | 18 | 1,585 | 122 | 385 | 2,755 |
| Caldas..... | 1,423 | | 1,479 | 78,445 | 11 | 14,563 | 352 | 8 | 29 | 325 | 61 | 901 |
| Cauca..... | 180 | | 508 | 36,204 | 69 | 3,804 | 107 | 354 | 10 | 10,228 | 250 | 1,361 |
| Cundinamarca..... | 318 | | 2,739 | 158,645 | 1,504 | 2,983 | 2,745 | 102 | 814 | 727 | 23 | 1,543 |
| Huila..... | 84 | | 287 | 13,819 | | 1,037 | 9 | 184 | (⁶) | 2,670 | 382 | 115 |
| Magdalena..... | 29 | 430,000 | 809 | 15,984 | | 1,640 | 4 | 82 | 8,994 | 426 | 972 | 499 |
| Nariño..... | 26 | | 1,168 | 49,289 | 268 | 1,300 | 2,592 | 435 | | 204 | 519 | 551 |
| Norte de Santander..... | 274 | | 166 | 49,079 | 185 | 2,710 | 131 | 70 | 132 | 65 | 176 | 763 |
| Santander..... | 152 | | 1,628 | 103,556 | 77 | 2,555 | 459 | 316 | 4,855 | 615 | 11,430 | 10,472 |
| Tolima..... | 573 | | 799 | 81,494 | 9 | 1,960 | 424 | 384 | 6,066 | 248 | 2,906 | 76 |
| Valle..... | 543 | | 1,563 | 182,524 | (⁶) | 9,017 | 218 | 852 | 946 | 7,118 | 2,439 | 32 |
| Total..... | 4,576 | 430,000 | 19,037 | 1,103,024 | 3,335 | 76,637 | 10,476 | 5,528 | 41,517 | 25,002 | 32,284 | 22,180 |
| Intendencias and Comisarias..... | 35 | | 273 | 1,860 | | 2,940 | 16 | 395 | 25 | 39 | 407 | 9 |
| Total Colombia..... | 4,611 | 430,000 | 19,310 | 1,104,884 | 3,335 | 79,577 | 10,492 | 5,923 | 41,542 | 25,041 | 32,691 | 22,189 |

¹ Exports.

² Including panela (unrefined brown sugar), miel (cane juice), and pan (loaf sugar).

³ With seed.

⁴ 1934.

⁵ Of 60 kilograms (132 pounds).

⁶ Less than 500.

Basic data from official Colombian sources (7, 12).

tions, on the farms of the large landowners, and by groups of capitalists engaged in large-scale operations. The small landowners and tenants have no machinery whatever, and their purchasing power is so low they will probably not be in a position to purchase any for years to come.

The hoe and the machete are the most common instruments used in cultivation in Colombia. The machetes are of two sizes, one with a large, heavy, rounded blade, the other about one-half as large but of the same general shape, called a banana knife. The latter is a universal tool and is carried almost constantly by the people in the country regions. Plows are used extensively only in the Cauca Valley, on the Sabana de Bogotá, and on a few cotton plantations in the Department of Atlántico. The other parts of Colombia are too hilly to use machinery advantageously. Tractors and disk plows are seen in the Cauca Valley and other agricultural machinery on large estates.

The methods used in the production of coffee, Colombia's most important crop, do not lend themselves to the use of machinery. Clearing the land, seeding, weeding, pruning, and harvesting require hand tools only, such as picks, shovels, axes, machetes, pruning knives, and hoes.

Adequate information on the quantity of agricultural machinery used is not available; but, since there is practically no local production, import statistics give an indication of the importance of machinery in cultivation. Although total imports increased 144 percent from 1936 to 1939, the 1939 total of 1.8 million dollars still represents a small investment in machinery. Tractor imports have been valued more highly than those of all other agricultural machinery since 1938 (table 7). Other important types of machinery purchased are plows, hay rakes, harrows, reapers, and gasoline motors.

TABLE 7.—Imports of agricultural machinery into Colombia, 1936-39

| Year | Total value of agricultural machinery | Tractors | |
|-----------|---------------------------------------|---------------|---------------------|
| | | Value | Proportion of total |
| | 1,000 dollars | 1,000 dollars | Percent |
| 1936..... | 735 | 292 | 39.7 |
| 1937..... | 1,344 | 423 | 31.5 |
| 1938..... | 1,771 | 1,118 | 63.1 |
| 1939..... | 1,798 | 1,278 | 71.2 |

The United States has been the chief supplier of agricultural machinery, furnishing 76 and 79 percent of the total value in 1936 and 1937, respectively. Germany was the second most important supplier, especially of small implements and parts.

Imports of agricultural machinery prior to 1934 were unimportant, reflecting the minor use of machinery in earlier years. In 1929, a peak year in purchasing power, the United States, the chief source of supply, shipped to Colombia a total of 241 plows, valued at \$6,522, and 92 tractors, valued at \$145,447. Total United States exports of farm machinery to Colombia in 1929, including dairy, poultry, and beekeep-

ing equipment, were valued at only \$253,749. The total value declined to \$63,604 in 1932, but by 1937 had increased to \$625,444 and by 1939 to \$1,114,599.

Oxen, used to draw the plows and other equipment, are the most important sources of power on small farms. Few horses or mules are used. On the larger farms that use modern machinery, the tractor with a gasoline motor is common. Small cultivators will probably continue to purchase only the small one-bottom plows and harrows. Larger operators furnish a potential market for wheel tractors, planters, harvesters and binders, reapers, threshing and hulling equipment, farm cane mills, and sprayers and dusters.⁷

The major part of the farm work in Colombia is done by members of the family. Since so many of the farms are small, family farms, there is very little need for hired farm labor. At coffee harvesttime it is necessary to hire additional workers in some sections, but even on the larger plantations the families of the tenants and the sharecroppers can usually take care of the harvesttime labor demands. The Magdalena Fruit Company in the Santa Marta area has a force of hired labor to work on the banana plantations. Inasmuch as the company is foreign-owned, it comes under the regulatory act of 1936, which provides that foreign-owned companies having a total pay roll of 1,000 or more pesos must recruit at least 90 percent of their laborers from native Colombians and must provide certain health, housing, and educational benefits for their workers.

Attempts have been made in the banana fields, as well as in other sections of the country, to establish agricultural labor unions, but as yet they have had very little success.

OWNERSHIP AND TENANCY

No figures are available as yet on the number of farmers owning their land or on the total area operated by owners. The small farmers usually do not own their land, but operate as tenants and sharecroppers. However, according to the housing census of 1938 the majority of the rural houses are occupied by owners.

TABLE 8.—*Proportion of land in four major crops cultivated by shareholders, tenants, and farm hands in Colombia, 1937-38*

| Crop | Total area cultivated | Shareholders, tenants, and farm hands | Proportion of total area cultivated by shareholders, tenants, and farm hands |
|-------------|-----------------------|---------------------------------------|--|
| | Acres | Number | Percent |
| Cacao..... | 81,402 | 2,866 | 12.1 |
| Cotton..... | 106,084 | 11,777 | 49.5 |
| Rice..... | 165,977 | 21,518 | 47.3 |
| Wheat..... | 493,304 | 17,580 | 18.2 |

Some data are available showing the number of sharecroppers, farm hands, and tenants, and the acreage cultivated by them for four selected crops (table 8). The proportion of hired farm labor is negligible

⁷ NEATHERLY, JACK B. COLOMBIA. U. S. Dept. Com. World Markets for Amer. Farm Equip., pp. 14-14f. 1939.

for these crops. Tenants were not particularly important in wheat and cacao production, but almost half the total cotton area and 47 percent of the riceland was worked by tenants.

CREDIT AND INDEBTEDNESS

Agricultural credit in Colombia has been provided by many different types of agencies. The National Federation of Coffee Growers has helped finance coffee growers; the Magdalena Fruit Company and later the Banana Cooperative Association have aided in financing banana producers; and other cooperative associations have been active in providing credit for different types of production. The Government has established credit agencies to supplement those already in existence, and these agencies now provide most of the agricultural credit.

The two principal governmental agencies providing agricultural credit are the Agricultural Mortgage Bank, which was established by a law of 1923, and the Agricultural, Industrial, and Mining Credit Bank, set up by law in 1931 (10, 1939). The Mortgage Bank is authorized to make long-term loans up to 10,000 pesos secured by a mortgage on rural property. The loans are to be for not less than 5 years with an interest rate not to exceed 10 percent. The Credit Bank is a limited corporation established for a period of 50 years to provide short-term production loans. At least 40 percent of its loans must go to small borrowers taking 2,000 pesos or less, and one-third must be under coffee guaranty.

The Credit Bank may rediscount its paper at the Bank of the Republic. Recently, these credit operations have represented 90 percent of the loans and discounts of the central bank. It has branch offices in the larger cities, and as a result of legislative authority of 1932 it encourages the establishment of sectional credit associations throughout the country.

An indication of the size of the farm-mortgage debt may be obtained from the statistics of mortgage banks. Total mortgage holdings of the banks varied between 28.1 million dollars in 1937 and 31.4 million in December 1939 and 56.6 in June 30, 1940. The Agricultural Mortgage Bank held 13.3 million dollars of this total in 1937 and 21.2 million on June 30, 1940. It is safe to assume that all the holdings of the Agricultural Mortgage Bank were on agricultural fincas in 1937. Three-quarters of the total mortgages held by the Agricultural Bank were in four Departments. The Department of Cundinamarca alone accounted for 35 percent of the total in 1937, Antioquia and Valle for 15 percent each, and Caldas for 12 percent.

The largest source of short-term credit at present is the Agricultural, Industrial, and Mining Credit Bank. Of the total of 15 million dollars loaned in 1939, 95 percent of the loans were made on livestock and agricultural products, chiefly cattle and coffee. The largest amounts of agricultural short-term loans were made in the Department of Caldas, about 25 percent of the total, in Antioquia about 13 percent, and in Cundinamarca and Tolima 10 percent each.

Loans were made to 23,932 individuals, totaling \$6,353,000 and averaging \$265. Cooperatives borrowed \$1,202,000, and \$7,445,000 was used to discount the paper of these cooperatives. The distribution, by size of loans to individuals, was as follows (7) :

| | <i>Percentage of total number</i> | <i>Percentage of total value</i> |
|--------------------|---|--|
| Under \$30..... | 13.9 | 1.2 |
| \$30-\$115..... | 45.4 | 12.4 |
| \$116-\$285..... | 23.4 | 17.9 |
| \$286-\$300..... | 13.4 | 30.9 |
| \$301-\$2,850..... | 3.1 | 23.1 |
| Over \$2,850..... | .8 | 14.5 |
| Total..... | 100.0 | 100.0 |

In 1934 the National Cattle Fund was created with an authorized capital of 5 million pesos, though only 1 million was made available for it.

The bonded warehouses set up by the National Federation of Coffee Growers are empowered to make loans on commodities stored therein. The bonds issued against the stored commodities may be discounted at the central bank. About 86 percent of the loans are guaranteed by coffee, although many types of products may be stored in the warehouses.

In 1940 the Colombian Government received a 10-million-dollar loan from the Export-Import Bank of the United States, and was also able to refund the internal debt at lower rates of interest. The funds thus secured enabled the Government to initiate a program of development for agriculture, manufacturing, and transportation. To provide additional agricultural credit, 5 million pesos (\$2,850,000) was allocated to increase the capital of the National Livestock Fund, and a new division was set up in the Credit Bank to incorporate the fund. The new division will make long- and medium-term mortgage and security loans to farmers for the purchase of property, livestock, and machinery, for crop expenses, etc. For crops requiring long periods to come into bearing, such as cacao, coconuts, and rubber, the Government is empowered to guarantee the loans made by the Credit Bank. In addition, the Credit Bank receives 2 million pesos (\$1,140,000) for its industrial-credit and agricultural-provisions section.

In order to stimulate long-term loans for agriculture and industry, the Credit Bank and the Mortgage Bank may issue bonds against the security and mortgages they acquire, which bonds are guaranteed by the Government.

Adequate machinery now seems to be available to provide credit for agricultural and livestock operations. The next few years will show the success or failure of the new plan.

FARM LIVING CONDITIONS (10, 1940)

The living standards of the farmers and agricultural workers are low. The usual farmhouse is a room 10 feet square with a thatched roof and a dirt floor (fig. 6). Farm animals share the house with the large family.

Staple food items are produced on the farm and consist of corn, yuca, beans, and panela (unrefined sugar). These are supplemented in some sections by bananas and plantains and in the higher altitudes by wheat and other grains. Very few vegetables and fruits are raised for home consumption, and the diet is lacking in vitamins and minerals.

Clothing requirements are not great in most sections, and very little is spent to clothe the family even in the highland region, where the climate is temperate or cold.

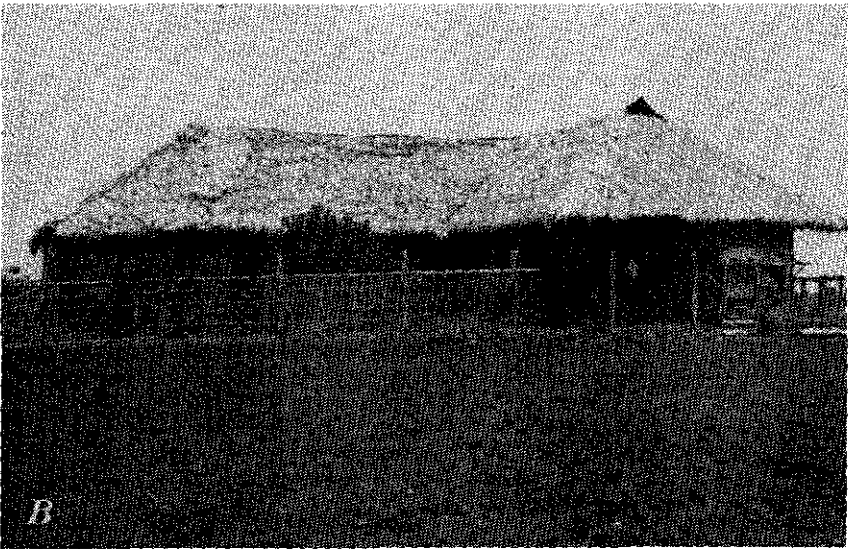
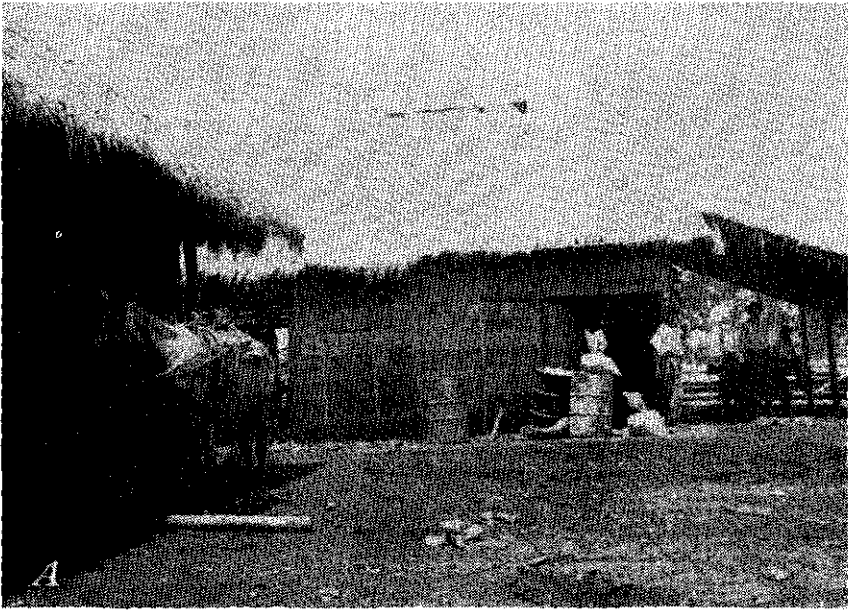


FIGURE 6.—Types of farm homes in Colombia.

CONSERVATION

The Government is interested in conserving natural resources, and several laws have been passed including provisions for conserva-

tion. Soil erosion is already causing much damage, especially on the steep hillsides where many small farmers are trying to make a living on small plots of land. The population is largely in the highland area, where they have cut the forests and planted annual crops, such as corn and potatoes, which increase erosion. Government engineers have estimated that during the rainy season the Magdalena River alone carries away 458,000 cubic yards of soil every day. This is the equivalent of $1\frac{1}{4}$ inches of soil from a million acres every year. The other rivers, particularly the Cauca, Atrato, and branches of the Orinoco, also carry away much valuable topsoil.

The mission of United States Government experts who visited Colombia in 1940 recommended that the Colombian Government make a survey of the damage actually being done by erosion and of what might be done to conserve the soil. They also recommended that a program be developed for removing the small farmers from the uplands and resettling them on the more fertile lands farther down the mountains. The upland areas could then be put into forests, orchard crops, and other vegetation that would tend to hold the soil. Such a program would not only conserve the land but lessen the runoff of water, which now causes floods and washouts of vital public works.

MARKETING

The marketing system for the two commercial crops, coffee and bananas, is different from that for products raised for domestic consumption. Coffee is handled largely through the National Federation of Coffee Growers, which buys the coffee direct from



FIGURE 7.—Sunday market at Girón.

the grower and makes all the arrangements for selling it abroad. Some coffee is handled by private brokers who have agents in the coffee country buying direct from the growers. Practically the entire Santa Marta crop of bananas, whether grown by private planters or by the Fruit Company, is marketed through the Fruit Company, which picks up the fruit at stated points along the company-owned railway and handles all arrangements for sale abroad, including the shipping of the fruit in its own boats.

The products that do not enter into foreign trade are usually sold in the larger towns at open-air markets, which are held every week in some localities and more or less often in others. (See figs. 7



FIGURE 8.—Taking a pig to market.

and 8.) There is little movement of commodities from one section of the country to another, especially from one valley to another or between the highlands and the low country, because of the difficult and high-cost transportation.

There are no organized spot or futures commodity markets in Colombia.

SELF-SUFFICIENCY

Staple food products of Colombia include rice, corn, wheat, cassava, bananas, plantains, and sugar. Meat is a staple article of the diet in certain sections. An abundant domestic supply of bananas and plantains is available, as well as quantities of bananas for export. Domestic meat production, particularly of beef, just about keeps pace with domestic demand. Imports of cattle for beef and imports of prepared meats have represented less than 1 percent of domestic requirements. Before the tariff duty on lard and other pork products was raised so high, considerable quantities were

imported. The tariff has stimulated the use of substitutes, particularly vegetable oils, and the importation of pork products has declined. Domestic lard production has increased, also, and imports of lard make up less than 3 percent of domestic needs. Copra is used extensively in the manufacture of vegetable lards. Colombia produces only 30 percent of domestic requirements of copra.

Domestic production of some staple food crops has been increasing, and in 1938 corn production was sufficient for domestic requirements. Imports of wheat, rice, sugar, cotton, and copra have continued large. Grain staples are the largest quantity imports, although imports represent only 14 or 15 percent of total consumption. Colombia supplies the major part of its sugar needs, 95 percent in 1938. Table 9 shows the domestic production, importation, and consumption of the major staple products imported in recent years.

TABLE 9.—*Production, imports, and consumption of important deficit crops in Colombia, average for recent selected years*¹

| Crops | Production | Imports | Consumption | |
|--------------------------------|------------|---------|-------------|---------------------|
| | | | Total | Proportion imported |
| Cotton..... bales | 19,686 | 15,139 | 34,825 | 43.5 |
| Copra..... 1,000 pounds | 3,754 | 13,508 | 22,562 | 83.4 |
| Rice..... 1,000 pounds | 168,848 | 26,367 | 185,215 | 14.2 |
| Sugar, refined..... short tons | 44,484 | 12,407 | 56,891 | 21.8 |
| Wheat..... 1,000 bushels | 3,615 | 462 | 4,078 | 11.4 |
| Cacao..... 1,000 pounds | 23,005 | 6,533 | 29,538 | 22.1 |
| Lard..... 1,000 pounds | 29,343 | 856 | 30,199 | 2.8 |

¹ Importation of meat, dairy products, corn, beans, and potatoes have averaged less than 1 percent of domestic requirements in recent years.

Data from official Colombian sources (5, 7).

Colombia has imposed high tariff duties on imports of the principal staple articles of food and fiber in a vain effort to become self-sufficient in the production of these commodities. The outstanding result of this policy has been increased living costs within Colombia, especially for its low-income groups. Production of some crops has increased under the stimulus of the protected price, but not to the point of independence of foreign supplies. The production of other crops, such as wheat, has not responded even to a price that includes a tariff of more than 2 pesos (\$1.24) per bushel. The maintenance of the high tariff over so many years has in some cases brought into production units that are inefficient either from the standpoint of soil and climate or from the standpoint of management or judgment in the use of the factors of production. For example, wheat is raised on land and under climatic and soil conditions quite unsuitable for its economic production, and inefficiency in the operation of sugar equipment and plant has been fostered. As in all countries striving for complete self-sufficiency, the laboring classes have paid dearly for this policy. The Colombian import duty on rice, for example, is nearly 2 cents a pound, on sugar 5 cents, and on cacao beans 7 cents. Table 10 gives the tariff duties on a selected list of imports into Colombia. The table also shows duties on a few agricultural products that might be imported in increased quantities if the tariff permitted.

TABLE 10.—*Colombian import duties on selected products, 1941*

| Product | Rate of duty | |
|--------------------------|---------------------------|--------------------------------------|
| | Centavos per kilogram | Cents per pound ¹ |
| Wheat..... | 8 | 124.06 ² |
| Flour..... | 18 | 4.65 |
| Cotton, raw..... | 10 | 2.58 |
| Lard..... | 30 (15 to U. S.) | 7.75 (3.88 to U. S.) |
| Corn..... | 10 | 144.74 ³ |
| Potatoes..... | 6 (5 to U. S.) | 1.55 (1.29 to U. S.) |
| Sugar, refined..... | 20 | 5.17 |
| Rice..... | 8 | 2.07 |
| Cacao beans..... | 26 | 6.72 |
| Cacao, ground..... | 60 | 15.51 |
| Copra ⁴ | 12 | 3.10 |
| Beans..... | 16 | 4.14 |
| Vegetable lard..... | 80 | 20.68 |
| Butter..... | 80 | 20.68 |
| Bacon..... | 80 | 20.68 |
| Hams and sausage..... | 80 (50 to U. S.) | 20.68 (12.92 to U. S.) |
| Milk, condensed..... | 15 (10 to U. S.) | 3.88 (2.58 to U. S.) |
| Fruits, fresh..... | 40 (20 to U. S.) | 10.34 (5.17 to U. S.) |
| | <i>Pesos per kilogram</i> | <i>Dollars per pound⁴</i> |
| Tobacco, cut..... | 10 (5 to U. S.) | 2.58 (1.29 to U. S.) |
| Cigarettes..... | 10 (5 to U. S.) | 2.58 (1.29 to U. S.) |
| Cattle..... | 10 ⁴ | 5.70 ⁴ |

¹ Converted to United States currency on the basis of 56.9806 cents to the peso (July 1941 rate).

² Cents per bushel.

³ Temporary reduction of duty to 3 centavos per kilogram, or 0.8 cent per pound, now effective on a specified quantity of imports.

⁴ Per head.

Compiled from tariff schedules.

Internal prices are high as a result of high import duties, and domestic production has responded somewhat during recent years. Transportation facilities within the country are very meager, however, and the high transportation rates sometimes offset the tariff advantage to producers. The tariff thus raises the cost without increasing domestic production to a level of self-sufficiency. Inadequate transportation facilities make regional specialization extremely difficult. In some places, it would be more advantageous to import products, were it not for the tariff (and even sometimes in spite of it), than to move them over a mountain peak within the country.

Recent restrictions on imports imposed by the Government include progressive reduction in the quantity of rice and wheat imports over the next 2 years (1942-43), with complete cessation of imports thereafter. The Government also has complete control over imports of sugar and cotton, allowing entry only of quantities that will supplement but not compete with domestic production.

With the difficulty of transporting products from one region to another, the possibilities at present of stimulating the most economic production in each area are uncertain. However, some regional planning of production according to soil, climate, and topography could provide greater production of certain important items. The agricultural survey of Colombia by experts from the United States Department of Agriculture indicates the feasibility of efforts to become self-sufficient in the products discussed below.

COPRA

Copra, the dried meat of the coconut, furnishes both edible and non-edible vegetable oil. Colombia imported 70 percent of its domestic

requirements of copra in 1938, even though the domestic price fixed by the Government was three times the world price. The regions along the coast and inland from Barranquilla and in the Department of Magdalena are favorable for the growth of coconuts. They require adequate ground moisture, but will grow in arid regions, in which they do not suffer much from fungus disease. The coconut is attacked by bud rot and a scale insect. The latter is being controlled fairly satisfactorily in Puerto Rico, and measures could be applied to control it in Colombia also. Since several years are required for coconuts to come into bearing, the small producer does not have the capital to finance expansion and wait several years for a return on his investment. In order to expand the production of copra, it would be necessary for the Government to aid small farmers in getting started, securing the small trees, and controlling the fungus and scale insect, or to encourage the development of groves by private capital. Within a few years, with Government aid, Colombia might become self-sufficient in copra and able to export some of the production to the United States. It would have an advantage over the Philippines as a source of supply because of the shorter freight haul to the United States market.

CACAO

Cacao is another tropical product imported into Colombia, imports supplying 18 percent of requirements in 1938 over a tariff wall of 7 cents a pound. Conditions are favorable for the growth of the cacao tree in the arid interior valleys and in some of the arid sections of the north coast, particularly in the Department of Magdalena and inland from Barranquilla. The cacao tree needs more moisture than is naturally available, but with irrigation it could be grown advantageously. The two most destructive diseases of the cacao in other regions, phytophthora rot and witches'-broom, flourish in damp, rainy weather; the arid regions, properly irrigated, seem to offer the best areas for expanded production. The possibilities are good for Colombia's becoming self-sufficient, but assistance would have to be extended to the grower in getting started, especially in providing irrigation.

SUGAR

The Cauca Valley has ideal conditions for growing sugar, and there are several regions in Colombia where increased acreage and more intensive cultivation are possible. Production has increased materially, and in 1938 only 4.5 percent of domestic requirements were imported. Colombia has the sugarcane borer, which causes considerable damage and which apparently has no natural enemies. Experimentation is needed to control this pest. It has been observed that the supply of trained labor in sugar factories is inadequate and that the operation of factories is inefficient. The high tariff of 5 cents a pound on sugar, however, enables producers to make a profit without technical efficiency. Improvement in the purity of the juice itself could increase production to a certain extent. Here the high tariff tends to decrease rather than increase production. There are possibilities, however, of increasing the acreage of sugar and extending the use of machinery in its cultivation.

RICE

Much good riceland is available in the interior valleys and on the great northern plain south of Barranquilla and Cartagena. Farmers are already using United States agricultural machinery for planting and harvesting rice, and production could be increased by more extensive use of such machinery. Colombia has been importing some 14 percent of domestic requirements of rice, and it has been estimated that the equivalent of these importations could be produced on about 10,000 additional acres of land.

COTTON

The climate and soils of parts of Colombia are good for the production of cotton, but the destruction by insect pests and diseases is very heavy. Farmers do not have a knowledge of the proper methods of seed germination. The stands are sometimes only 15 or 25 percent of what the normal stand of a cottonfield should be. In the Tolima Valley, with rich soils and nearness to market, farmers do not make money out of cotton in spite of the high price (raised by a tariff of 26 cents a pound). The Government seems to be anxious to stimulate the production of cotton, but it would appear that more investigation is needed concerning the areas best suited to its production, the control of insect pests and diseases, and the cost of production, the yield, and the economic return from cotton as compared with those from alternative crops.

WHEAT

Colombia imported only 15 percent of its domestic wheat requirements in 1938, but a good part of the wheat was grown in the upland country where yields are low, the climate is cool, and the small farms are located on sloping hillsides. The further development of such wheat production would not be economic. If production were transferred to more suitable regions, better yields and more intensive cultivation would be possible. It would be necessary to have Government or other aid in making such a shift and in equipping the farmer with machinery. Before wheat production is expanded, a thorough study of the possibilities should be made, including the relative advantage of wheat as compared with other crops in this region.

FRUITS AND VEGETABLES (27)

Many fruits and vegetables supplement the diet, particularly in the larger cities. Root crops, such as cubios, hibias, arracachas, and chuguas, as well as the balú bean, which is a favorite food, are sources of vitamins in the highlands. Native fruits of the Andean region include the curuba de Castilla, the papaya, and the Colombia blackberry, similar in flavor to the loganberry. The Indians eat many tunas, or prickly pears, and tumbos, or bodeas, the fruit of the passion-flower.

Fruit and truck-crop industries could be developed around the large centers of population to improve the diet of the city people. Perhaps the establishment of Government nurseries throughout the country would be desirable. The Tolima Valley could be irrigated to provide

vegetable crops for Bogotá, although crops like mangoes, avocados, sapotas, and limes could be grown on the hillsides of the valley without irrigation. Vegetables could be grown to advantage around Barranquilla, Cali, and Cartagena, and navel oranges in the Cauca Valley, on the slopes of the Tolima Valley, in the lower Medellín Valley, and in Caldas. The region of Santa Marta and Barranquilla and the lower slopes of the Tolima Valley offer opportunity to produce grapefruit and avocados, and fine pineapples can be grown in both the Cauca and the Tolima Valleys.

BAMBOO

Bamboo should thrive in many regions. It retards erosion and could be planted on the hillsides. Valuable species of bamboo not now available in Colombia could be secured from the Puerto Rican experiment station. The development of the bamboo, which has many uses in tropical lands, could do much to improve the standard of living of the people.

SUMMARY OF POSSIBILITIES

Physical and economic conditions in Colombia offer possibilities for self-sufficiency in the production of copra, cacao, sugar, and rice. Government or other aid would need to be extended, especially for copra and cacao, which are both tree crops. The two other commodities that are imported in substantial quantities for domestic consumption are cotton and wheat. Although the climate and soil seem favorable for cotton growth and wheat will grow abundantly in the semitropical regions of the country, more study and investigation of these products are needed, especially with reference to the relative advantage of these crops as compared with others that might be grown in the region.

The diet and living conditions of the people could no doubt be improved by an expansion in the production of fruits, vegetables, and bamboo.

AIDS TO AGRICULTURE

Organized aid to agriculture has developed slowly, and it is only in recent years that much progress has been made in this direction. The National Federation of Coffee Growers has perhaps been the most important single agency with this purpose. Its efforts have been concentrated largely on the coffee industry, and a discussion of its establishment and the policies followed by it will be found under the section on coffee.

GOVERNMENT POLICIES

Governmental assistance to farmers has included tariff protection, currency depreciation, and agricultural-credit measures. During the past few years the Government has taken an active interest in developing plans for the expansion of agricultural production in the country, and several new laws have been added to the statutes authorizing certain lines of action. As yet there has been little change in the actual operation of the industry, but the plans are being developed and the framework is ready for constructive action.

The most important governmental action for the promotion of agriculture, until recently, was the establishment of a high import tariff on most imported products. The Government hoped through the tariff to stimulate domestic production of essential foods and fibers to a self-sufficiency basis. Duties have been high for a long time, particularly during the World War of 1914-18.

In the early 1930's the Government began to realize the need for more fundamental assistance for agriculture, and in December 1931 a National Council of Agriculture was established to (1) promote agricultural research, instruction, and extension work through higher schools of agriculture to be set up, one at sea level, one in the uplands, and one in the mountain area; (2) promote extension work by field workers; (3) provide for three agricultural institutes, one at Bogotá, one at Medellín, and one at Palmira; (4) provide more adequate agricultural statistics; (5) acquire machinery, draft animals, and other agricultural necessities to be rented at moderate fees to small farmers and stockmen.

As world economic conditions grew worse through 1932 and 1933, the Colombian Government considered more definite means of aiding farmers, and in May 1933 created a board to study the problems of agriculture, industry, tenancy, ownership, establishment of agricultural colonies, and separation of public lands from private property. The Government reduced the security for loans required of small farmers and provided direct grants of funds to set up cooperative credit establishments.

In May 1938 a program for agricultural expansion and conservation of resources was adopted. Its three major objectives were (1) agricultural self-sufficiency in food and clothing, including corn, rice, sugar, potatoes, cotton, wool, cattle, hides, and leather; (2) conservation of forest and agricultural resources; (3) cultivation of tropical products with Government aid and assistance, including coffee, cacao, copra, medicinal herbs, bananas and other fruit, and possibly rubber.

The program involved, first of all, research in the experiment stations to determine the best methods of cultivation and harvest, as well as studies looking toward the control of diseases and pests. Methods and practices developed in the stations were to be practiced on surrounding lands to determine their feasibility. Campañas, or commissions, have been formed for several of the different crops in which the Government is particularly interested, including cotton, rice, cacao, sugar, and wheat. The campañas for each crop are located in those regions and Departments best suited to its production.

Again in June 1940 further decrees were issued, providing for the reorganization and addition to the capital of the Agricultural, Industrial, and Mining Credit Bank; new forms of credit were provided for the development of agriculture, livestock, and industry; and provisions were made for the cooperation of commercial banks to aid agriculture and industry. Further aid to agriculture was given in the form of loan guaranties, and a public works program of railroad and highway construction was initiated.

The objectives of the new plans are to stimulate the production of foodstuffs and raw materials sufficient for domestic development and

to increase the purchasing power abroad by increasing the exportation of products from the country. The Ministry of National Economy is authorized to establish experimental farms and research laboratories, organize processing and preserving plants, and encourage the formation of cooperatives. An Industrial Development Institute has been formed, which will promote the establishment of new industries. To protect domestic industry, additional restrictions have been placed on the importation of cotton and yarns, fats and oils, grains, sugar, etc.

COOPERATIVE ORGANIZATIONS (2)

The cooperative movement in Colombia is a relatively recent one. About 20 years ago a few cooperatives were started, but they did not do well. It was not until 1931, when the Government became interested in the development of some such movement, that any headway was made. Beginning in 1931 and continuing to the present time, a series of laws and decrees by the Federal Government has encouraged the formation of cooperatives and aided them in their activities. Growth in both number and operation has been fairly rapid since 1933. The growth of all types of cooperatives is shown in table 11.

TABLE 11.—*Number, membership, capital, and value of operations of cooperatives in Colombia, 1933-39*

| Year | Number | Membership | Value of operations | |
|-------|--------|------------|---------------------|------------|
| | | | Pesos | Pesos |
| 1933 | 4 | 1,087 | 46,393 | 169,736 |
| 1934 | 16 | 3,380 | 197,137 | 1,249,408 |
| 1935 | 25 | 6,519 | 360,691 | 2,514,974 |
| 1936 | 48 | 13,182 | 692,546 | 3,110,309 |
| 1937 | 104 | 19,886 | 1,158,334 | 8,143,349 |
| 1938 | 120 | 27,498 | 1,751,269 | 5,962,059 |
| 1939 | 170 | 37,011 | 2,545,263 | 8,832,769 |
| Total | | | | 26,482,604 |

AGRICULTURAL TRAINING

Schools of agriculture have made very little progress in Colombia. Few trained workers are available either in agricultural economics or in agronomy, especially in the field extension offices. There is little Colombian literature on correct agronomic practices for various crops, and no central service to develop and provide information to farmers, such as there is in the United States Department of Agriculture, for example. Trained personnel is necessary to develop specialized information and to get it to the farmer. Several colleges of agriculture provide a general background for work in this field, but there is need for more specialized instruction in tropical agriculture particularly, and in the related fields of agricultural economics, genetics, and chemistry.

In 1938 there were 26 schools of agriculture, with an enrollment of 985, as against 9 schools and 426 students in 1937. Of the total of 985 in 1938, only 46 were scheduled for graduation. The official schools having the largest enrollment were those in the Departments of Valle, Boyacá, and Antioquia. These three had 74 percent of the total.

Several experiment stations, substations, and model farms are located in various sections of the country. Experimental work is done and the results given to farmers in the surrounding areas. There is no systematic extension work, and it has been difficult to educate the farmers in better methods of cultivation. In some areas, such as the highlands, the Indians do not like to change the methods they have used for centuries, and it is particularly difficult to introduce new methods.

MAJOR EXPORT CROPS

COFFEE

The coffee industry occupies the place of first importance in the economy of Colombia. The welfare of every citizen is touched by its influence, either directly through work in the coffee plantations or indirectly through its effect on the external purchasing power of the country. Colombia is the leading world producer of mild coffee and supplies about 20 percent of the coffee requirements of the United States. In spite of the current difficulties brought about by the loss of European markets, the fundamental position of Colombian coffee is good. The country has unique advantages for growing fine coffee. Given intelligent and careful planning during the difficult period ahead, the coffee industry promises to continue to hold first place in the economic life of Colombia.

Coffee was first exported in 1835, when 2,592 bags left the country. By the middle of the nineteenth century production and exports had increased considerably, and by 1880 coffee had become the principal article of foreign trade. It was not until about 1920, however, that Colombia became an important factor in the world supply of coffee. Table 12, showing coffee exports from Colombia by 10-year intervals from 1835 to 1940, indicates the tremendous increase in the industry in recent years. These figures are also indicative of growth in total output, since the major part is exported.

TABLE 12.—Exports of coffee from Colombia, 1835-1940

| Year | Exports | Year | Exports |
|------|---------------------|------|---------------------|
| | <i>1,000 pounds</i> | | <i>1,000 pounds</i> |
| 1835 | 344 | 1895 | 47,399 |
| 1845 | 3,164 | 1905 | 66,246 |
| 1855 | 4,550 | 1915 | 149,207 |
| 1865 | 8,519 | 1925 | 237,541 |
| 1875 | 10,055 | 1935 | 498,548 |
| 1885 | 14,665 | 1940 | 593,126 |

The Coffee Industry of Colombia (16).

IMPORTANCE OF THE INDUSTRY

The coffee industry represents a large proportion of the national resources, with an estimated investment of 250 million pesos (142 million dollars). Practically all of this wealth is owned by native Colombians (17). Approximately one-fourth of the entire population depends directly on coffee growing for a livelihood, and the fortunes of the industry indirectly affect the welfare of the remaining three-quarters.

Most of the coffee is produced for export, the domestic consumption

in 1940 running only 400,000 bags out of a total production of over 4.5 million bags. Colombia must import most industrial products, as well as large quantities of foodstuffs and raw materials, to supplement domestic production. Coffee exports provide most of the exchange with which to pay for these imports.

Coffee usually has represented well over half the total value of all exports, although the trend of its relative importance has declined. From 1906 to 1924 the general trend was upward, rising from slightly over 40 percent of the total value to almost 80 percent of the total. Since then it has been declining, partly because of the lower unit price of coffee exports and partly because of the spectacular rise in petroleum exports. In 1940, however, the value of coffee exports still accounted for 49 percent of the total export value.

Colombia has supplied a significant proportion of world coffee requirements since 1920 and today ranks second to Brazil as a source of supply. During the past 10 years it has accounted for about 15 percent of world consumption and from 20 to 25 percent of United States imports. Colombia is the leading producer of mild coffee, which is much in demand to blend with Brazilian coffees. The consumption of mild coffee has increased by one-third in the past 15 years, and Colombia has supplied almost one-third of this type. Table 13 shows the place of Colombian coffee in the world picture.

TABLE 13.—Colombian coffee in world consumption and production and in United States imports, 1905-39

| Year | Colombian production as percentage of— | | Colombian exports as percentage of— | | Year | Colombian production as percentage of— | | Colombian exports as percentage of— | |
|-----------|--|---------------------------------|-------------------------------------|-----------------------|-----------|--|---------------------------------|-------------------------------------|-----------------------|
| | Total world production | World production of mild coffee | World consumption | United States imports | | Total world production | World production of mild coffee | World consumption | United States imports |
| 1905..... | 4.0 | 11.8 | 3.0 | — | 1935..... | 11.6 | 31.3 | 16.7 | 21.1 |
| 1910..... | 2.3 | 12.0 | 3.4 | 6.2 | 1936..... | 10.5 | 30.2 | 15.4 | 19.8 |
| 1915..... | 3.5 | 13.8 | 5.2 | 9.1 | 1937..... | 11.4 | 30.6 | 16.3 | 25.2 |
| 1920..... | 8.1 | 26.4 | 7.8 | 15.0 | 1938..... | 11.8 | 33.1 | 16.7 | 22.8 |
| 1925..... | 8.0 | 22.4 | 9.5 | 16.5 | 1939..... | 11.6 | 29.4 | 14.1 | 21.0 |
| 1930..... | 11.3 | 29.6 | 13.2 | 22.1 | | | | | |

Data from official Colombian sources (?) and records of the Federación Nacional de Cafeteros de Colombia (15).

DESCRIPTION OF THE INDUSTRY

The coffee beans that furnish the breakfast beverage in so many American homes are the fruit of the tropical and semitropical coffee tree. The quality of the beans depends on the soil, climate, elevation, and care in cultivation and processing. The people in the coffee country take pride in the distinctive quality of their product and take pains to protect its good name in the market by careful grading practices.

LOCATION

Coffee production follows the upland slopes of three mountain ranges, the most important producing areas being on both sides of the Central and on the west side of the Eastern Cordilleras. There is

some commercial production on the northern and western slopes of the Sierra Nevada de Santa Marta, and small quantities are grown on the western side of the Western Cordillera. The best Colombian coffee is grown on hillsides ranging from 3,000 to 6,000 feet above sea level, and the Departments having areas within these limits are the important producers. Caldas is the leading producer at present, furnishing almost a third of the total output. Antioquia, Cundinamarca, Valle, and Tolima are all large producers, each one furnishing from 10 to 17 percent of the total.

Table 14 and figure 9 show the distribution of acreage and the production by Departments in 1932. The National Federation of Coffee Growers estimates that there has been an increase of about 10 percent since 1932, which would mean that the total acreage is now 968,000 acres with 584 million trees.

TABLE 14.—Coffee acreage and number of coffee trees in Colombia, 1932

| Department | Coffee farms | Area in coffee | Number of trees | Average area cultivated per farm | Trees per acre | Average number of trees per farm |
|-------------------------|---------------|----------------|------------------|----------------------------------|----------------|----------------------------------|
| | <i>Number</i> | <i>Acres</i> | <i>Thousands</i> | <i>Acres</i> | <i>Number</i> | <i>Number</i> |
| Caldas..... | 40,174 | 193,821 | 95,140 | 4.8 | 491 | 2,368 |
| Antioquia..... | 28,589 | 157,593 | 98,110 | 5.5 | 623 | 3,432 |
| Tolima..... | 12,771 | 147,798 | 75,339 | 11.6 | 510 | 5,899 |
| Cundinamarca..... | 13,812 | 94,682 | 64,699 | 6.9 | 683 | 4,684 |
| Valle..... | 20,069 | 94,485 | 45,842 | 4.7 | 485 | 2,284 |
| Norte de Santander..... | 7,972 | 61,790 | 60,136 | 7.8 | 973 | 7,543 |
| Santander..... | 3,045 | 46,086 | 43,792 | 15.1 | 950 | 14,382 |
| Cauca..... | 12,477 | 27,038 | 15,573 | 2.2 | 576 | 1,248 |
| Huila..... | 4,471 | 21,859 | 9,957 | 4.9 | 456 | 2,227 |
| Magdalena..... | 682 | 13,491 | 10,634 | 19.8 | 79 | 1,559 |
| Boyacá..... | 1,333 | 10,532 | 4,818 | 7.9 | 457 | 3,614 |
| Nariño..... | 3,811 | 8,638 | 5,391 | 2.3 | 624 | 1,415 |
| Bolívar..... | 142 | 2,477 | 1,589 | 17.4 | 642 | 11,190 |
| Total..... | 149,348 | 880,295 | 531,020 | 5.9 | 603 | 3,556 |

Federación Nacional de Cafeteros de Colombia (14).

The producing regions have shifted to the west during the past 20 years, and the relative importance of the different Departments in supplying the market has changed. The most striking changes are the increasing importance of Caldas, Valle, and Tolima, and the declining importance of the two Santanders (table 15).

TABLE 15.—Percentage of total Colombian coffee produced in various Departments, 1913-14 and 1939-40

| Department | 1913-14 | 1939-40 | Department | 1913-14 | 1939-40 |
|-------------------------|----------------|----------------|----------------|----------------|----------------|
| | <i>Percent</i> | <i>Percent</i> | | <i>Percent</i> | <i>Percent</i> |
| Caldas..... | 18.7 | 32.3 | Santander..... | 9.8 | 3.2 |
| Antioquia..... | 17.3 | 16.5 | Cauca..... | 2.8 | 2.7 |
| Valle..... | 4.7 | 14.6 | Magdalena..... | 3.7 | .2 |
| Tolima..... | 5.6 | 12.7 | Huila..... | | 1.6 |
| Cundinamarca..... | 18.7 | 10.9 | Nariño..... | | .2 |
| Norte de Santander..... | 18.7 | 5.0 | Boyacá..... | | .1 |

Data compiled from records of the U. S. Bureau of Foreign and Domestic Commerce (1) and the Federación Nacional de Cafeteros de Colombia (15).

The Department of Caldas contains the fertile producing region of Del Quindo, but coffee is produced in almost all sections of the De-

partment. The larger centers of the trade are Armenia, Pereira, Calarcá, Santa Rosa, and Manizales. Coffee is cultivated in 81 of the 98 municipalities of Antioquia although the large centers of production are around Fredonia, Andes, Salgar, Abejorral, and Sonsón.

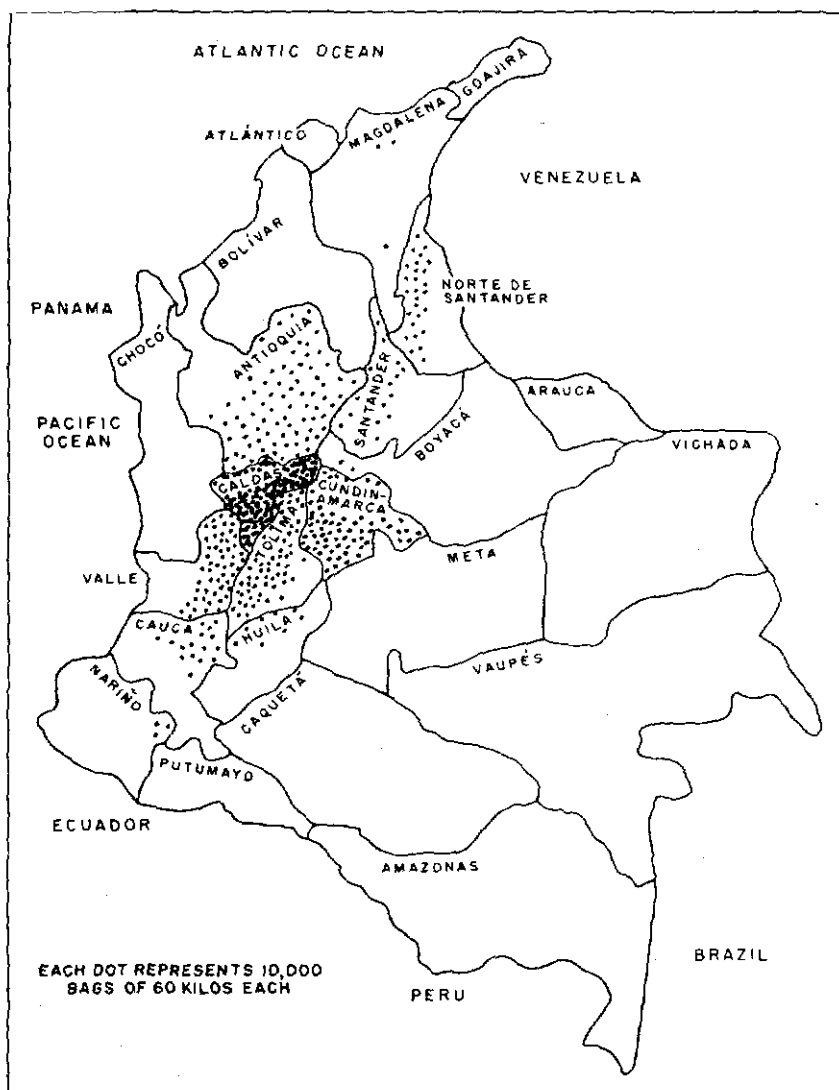


FIGURE 9.—Coffee production in Colombia.

Coffee is produced throughout Cundinamarca, but heavy production is concentrated in certain areas. The two municipalities of Viotá and El Colegio produce about one-fourth of all the coffee produced in the Department. Other important regions are around Fusagasugá, Quipile, and La Mesa.

Cultivation of coffee in Tolima centers around Líbano, with 10 million trees in 1932, Ibagué, Cunday, and Chaparral. The municipality of Sevilla in Valle is twice as important a producer as any other municipality in the Department. The other large producing sections are around Anserma Nuevo, Tuluá, Pradera, Candelaria, and Caicedonia. The slopes of the Sierra Nevada de Santa Marta would offer one of the most fertile fields for expanded production of coffee were it not for the scarcity of labor in the district. The soil and climatic conditions are ideal for good-quality coffee, and transportation to seaports is not difficult.

SIZE OF FARMS (14)

There are a few large coffee plantations, but most of the coffee is grown on small fincas, varying in size from 2 to 25 acres. The average area in coffee per farm was 5.9 acres in 1932, with an average of 3,556 trees. The plantations vary in size in the different districts. They are small in the Central Cordillera and much larger in the Eastern Cordillera and in the Tolima Valley.

Average acreage figures, however, do not give a very clear picture of the size of farms. For 1932, of the total of 149,348 coffee plantations, 129,556, or 87 percent, on an average had less than 5,000 trees (see table 16) and produced 40 bags of coffee a year. Only 321 plantations, or 0.2 percent, had more than 100,000 trees and produced an average of 800 bags of coffee a year. In comparison with those in Brazil, where plantations containing several million trees are not uncommon, even the larger plantations of Colombia look small.

TABLE 16.—Percentage distribution of Colombian coffee farms according to number of coffee trees on each farm, 1932

| Department | Under 5,000 | 5,000 to 20,000 | 20,000 to 60,000 | 60,000 to 100,000 | Over 100,000 |
|---|-------------|-----------------|------------------|-------------------|--------------|
| | Percent | Percent | Percent | Percent | Percent |
| Antioquia..... | 85.46 | 12.35 | 1.81 | 0.23 | 0.15 |
| Bolívar..... | 29.58 | 59.86 | 7.74 | 2.11 | .71 |
| Bogotá..... | 86.87 | 13.13 | | | |
| Caldas..... | 90.79 | 8.49 | .64 | .06 | .02 |
| Cauca..... | 97.73 | 2.27 | | | |
| Cundinamarca..... | 90.51 | 6.67 | 1.86 | .49 | .67 |
| Huila..... | 93.10 | 7.20 | .60 | .05 | .05 |
| Magdalena..... | 38.85 | 51.02 | 6.89 | 1.03 | 2.21 |
| Nariño..... | 96.59 | 3.04 | .28 | 1.05 | .03 |
| Santander..... | 49.26 | 37.04 | 9.95 | 1.67 | 2.08 |
| Norte de Santander..... | 64.32 | 30.30 | 4.42 | .48 | .48 |
| Tolima..... | 75.25 | 20.90 | 2.89 | .48 | .48 |
| Valle..... | 92.07 | 7.54 | .35 | .02 | .02 |
| Total..... | 86.75 | 11.33 | 1.49 | .22 | .21 |
| Percentage of total trees on these farms..... | 48.79 | 24.67 | 12.57 | 5.51 | 8.46 |

Federación Nacional de Cafeteros de Colombia (14).

SOILS

Soils in the Andean ranges where coffee is grown are very fertile and are ideally suited to coffee culture. They are partly of volcanic origin, are formed by the disintegration of vegetation and rocks, and are almost always dark or black in color. The soils on the lower slopes of the mountains resist erosion. The salty volcanic ash of Antioquia is noted particularly for its flavor-giving qualities. The

soil of the highland region of the Central Cordillera is high in potash and iron and is several feet deep. On the steep slopes of the Eastern Cordillera is heavy clay, with sandy clay at the lower elevations. The Sierra Nevada de Santa Marta, one of the best coffee-growing regions, has steep slopes for drainage and deep, fertile soils; the top layer is a dark-brown clay with much humus, and the subsoil is heavy red clay with a high potash and iron content.

CLIMATE AND RAINFALL

Ideal conditions for the cultivation of the coffee tree include a warm, uniform temperature, ranging from 60° to 80° during the day; rainfall well distributed and regular; diffused sunlight; and an altitude of from 3,000 to 7,000 feet above sea level. The highland area of Colombia furnishes these ideal conditions. The temperature varies with the elevation, the best coffee lands being found in the highlands, where the weather is springlike, and in the Cauca Valley, where the climate is semitropical. Two wet and two dry seasons alternate in the central Andean region. Mists and clouds rise from the lowlands during the rainy season, drenching them and protecting them from the noon sun. The rains come about a month earlier in the higher elevations than at the lower levels. Most of the rain comes at midday or in the afternoon, with no heavy downpours. There is a long dry period for ripening and harvesting (19).

VARIETY OF COFFEE PRODUCED

The seeds of *Coffee arabica* L. furnish the bulk of the world's commercial coffee, as well as 98 percent of Colombia's coffee. The plant is an evergreen, with oval-shaped leaves, which are dark green and waxlike on the upper surface and a lighter green underneath. The coffee grown in Colombia has a heavy body and a delicious aroma and flavor, which make it valuable for blending. It contains a large proportion of oil and has a high caffeine content, a low weight of ash, and a uniform green color of berries.

PESTS AND DISEASES

Relatively little damage to coffee production occurs because of pests and diseases. The trees can be treated promptly, since they are grown largely by hand on small units. The common diseases of Colombian coffee are iron rust, called *la mancha de hierro*, root rot, and others caused by fungi. Some damage is caused by lice, borers, and ants, particularly the *hormiga arriera*. Where the trees have too much shade or moisture, they are burdened with moss and afflicted with *la gotera*, a tree disease caused by infiltration.

LABOR AND EQUIPMENT

The large families on the small *fincas* in the Central Cordillera usually furnish sufficient labor to cultivate and harvest the coffee crop. Men, women, and children are all kept busy at the time of harvest. It is sometimes necessary to draw in additional labor at this time, and calls for laborers are posted throughout the Andean

region. The large plantations depend primarily on hired labor, although there are a few tenants.

Labor is scarce in some sections, especially in the Sierra Nevada de Santa Marta region, where the banana fields compete with coffee plantations for labor. During the harvest period, labor is secured from regions west of the Magdalena River and sometimes from the West Indies. The oil fields compete for labor in other sections, but usually the supply for the coffee crop is adequate.

There has never been much labor trouble either in the producing or in the processing of coffee. Coffee workers have no central union or organization, although there are several local unions in the producing and processing areas. The local unions of workers in the treating plants (trilladoras) have more influence than those in the producing field.

The National Federation of Coffee Growers is continually urging better health conditions for coffee workers and tries to teach the workers themselves the importance of health measures. Propaganda against the use of tobacco and intoxicating liquors is included in this educational effort.

Health and living conditions vary throughout the regions. According to Tomlinson (29), who described conditions on one of the large haciendas in the Cauca Valley from first-hand knowledge, the workers receive 55 to 60 centavos and a piece of panela (native brown sugar) for a day's labor. They are provided with a one-room house and are welcome to gather the bananas and plantains that grow on the hacienda. They may have a garden and some chickens if they like. At harvesttime they are paid on a piece-rate basis and receive about 8 centavos for each 3½-pound basket of coffee they gather.

Most of the laborers on the plantations in the Sierra Nevada de Santa Marta are mestizos and Indians, who earn from \$1.00 to \$1.25 a day, which is well above the average for the country.

Wage rates for hired labor vary greatly from one region to another, depending on the supply of workers and the alternative opportunities for employment. Some plantations furnish food as part of the payment, but this practice is not general. Men usually receive from 20 to 30 centavos a day more than women workers (table 17).

TABLE 17.—Daily wages of coffee workers in Colombia, 1936

| Department | Men over 18 | Women over 18 | Department | Men over 18 | Women over 18 |
|-------------------------|-----------------|-----------------|----------------|-----------------|-----------------|
| | <i>Centavos</i> | <i>Centavos</i> | | <i>Centavos</i> | <i>Centavos</i> |
| Caldas..... | 89 | 59 | Cauca..... | 39 | 44 |
| Antioquia..... | 70 | 48 | Huila..... | 69 | 38 |
| Tolima..... | 82 | 47 | Magdalena..... | 76 | 42 |
| Cundinamarca..... | 60 | 41 | Boyacá..... | 31 | 21 |
| Valle..... | 91 | 63 | Nariño..... | 34 | 21 |
| Norte de Santander..... | 71 | 48 | Bolívar..... | 73 | 49 |
| Santander..... | 37 | 41 | Atlántico..... | 67 | 38 |

[Colombia] Contraloría General de la República (8).

The machete is the most important tool in coffee culture, as it is in most agricultural production of Colombia. It is used to clear the ground for planting, to prune the growing tree, and to chop out

the weeds between the trees. A hoe is also used to keep the weeds down, and on the larger plantations the farmer uses a hand plow between the trees two or three times a year. These three tools, together with human labor, take care of the actual production and harvesting of the cherries. (The coffee berry is usually called a cherry because of its cherry-red color when ripe.) Mules and oxen are used in harvesting.

After the cherries have been picked from the tree by hand, they must be cleaned and prepared for market. Simple machines are used for this purpose.

Even the small fincas have pulpers (*despulpadoras*) and washers. Pulping machines are of many types, some worked by hand, some mechanically operated, with speed gears to increase the velocity. The drying machine manufactured locally uses a current of hot air. The chemical transformations that occur during drying give the coffee a characteristic color and aroma.

The larger plantations have machinery and equipment to prepare the coffee for market, including hulling and polishing machines. Most small cultivators take their dry beans "en pergamino" (before removal of the parchment covering) to the coffee centers, where the treating plants hull, polish, and grade the coffee for sale. The hulling or threshing machines on the large plantations are worked by hydraulic, electric, steam, or gas power. On some small plantations, threshing machines are run by hand.

OWNERSHIP AND TENANCY

Only general statements can be made with reference to ownership of coffee land. The small farms in the Central Cordillera are usually owned by individual farmers, whose chief commercial crop is coffee but who also raise subsistence crops for family use. The larger plantations in the Eastern Cordillera are owned by absentee landlords, who let the land to tenants and croppers. This is particularly true in Cundinamarca. The owners usually live in Bogotá or abroad.

On the largest plantations hired labor is generally employed, but sometimes a part of the land is rented to tenants who must grow coffee and sell it to the owner. Sometimes a small section of land is leased to a tenant for his own use in exchange for his labor on the coffee plantation.

One interesting fact about landownership in the coffee country is that less than 5 percent of the entire industry is owned by foreigners. Coffee is indeed a Colombian industry.

METHODS OF PRODUCTION (31)

PLANTING

New coffee trees are planted each year to replace old ones going out of production (fig. 10) as well as to increase the size of the plantation. For tree crops the year-to-year planting is not as important a factor in production as it is for annual crops, nor does it entail such a large expense.

Coffee is first planted in seedbeds and then transplanted to nurseries. When the plants are about $1\frac{1}{2}$ feet high, they are set out from 12 to 15 feet apart. In the early days seedlings were ob-

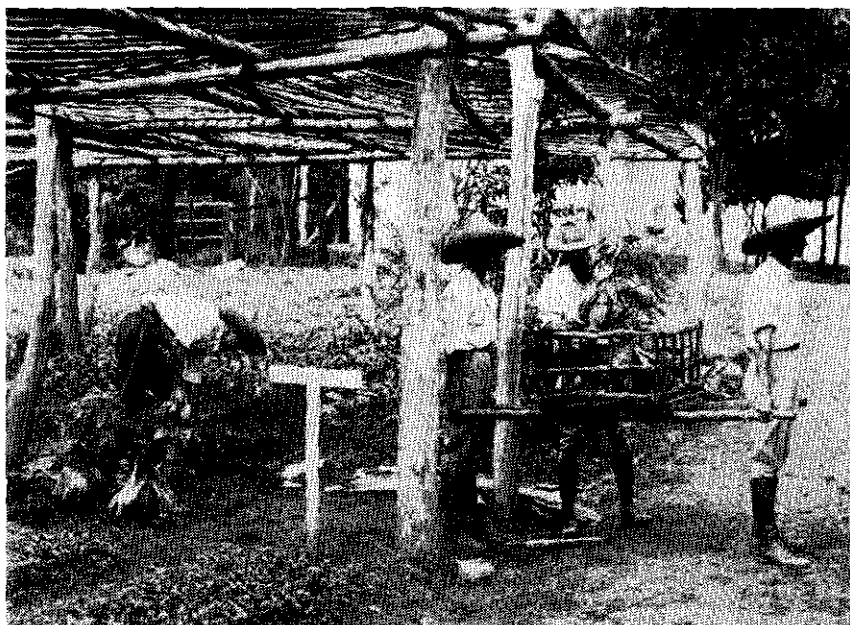


FIGURE 10.—Transplanting coffee from a nursery.



FIGURE 11.—Picking coffee on a coffee plantation.

tained from chance sprouts of fallen seeds, but the use of selected seeds is now becoming general.

The tree does not come into bearing for 3 or 4 years and does not reach maturity until it is 6 years old (fig. 11). In the lower altitudes the life of the tree is from 40 to 50 years, in the higher regions somewhat less. No statistics are available on the age of the trees standing, but the Coffee Federation estimated that in 1938, 90 percent of the trees were less than 5 years old and that only a few were over 15 years old.

CULTIVATION

Practically all of the Colombian coffee, especially in the warmer sections and at the lower altitudes, is grown under shade to improve its quality. Banana trees are used for the younger plants, and these are later replaced by fast-growing trees that develop ample foliage. The guamá, other species of ingas, and some species of acacias, cassias, albizzias, and erythrinas are used. On the smaller plantations, corn and yuca are also used for shade, since they also furnish needed articles of diet. The trees require more shade and attention on the lower slopes than at the higher elevations, but they produce a larger berry and have a longer life.

The coffee plant requires very little cultivation other than pruning, occasional weeding between the trees, and removal of plants and creepers from the coffee and shade trees. This last is done, either by hand or with the aid of tools, before florescence begins. It is also customary to rub the tree with rough material or metallic gloves to remove moss. Some plantations are plowed between the trees. Trees are pruned (fig. 12) down to a height of 5 to 5½ feet in some sections. Pruning improves the fruit and facilitates hand picking. Limited growth is practiced in the Departments of Caldas, Antioquia, Tolima, Cundinamarca, and Valle, and unlimited growth in Norte de Santander, Santander, Magdalena, Boyacá, and Bolívar. Cauca, Huila, and Nariño use both methods. In the Sierra Nevada district, the trees are not pruned back because of the high labor cost, and are sometimes allowed to grow to 12 or 15 feet in height. The trees often break down from the weight of the berries. The pruning methods used in different parts of the country are not uniform, but depend on the age of the trees and the fertility and temperature of the soil. Cultivators have found that the most economical harvest is obtained if there is only one trunk or stem; and the twigs, unproductive branches, and branches near the ground must be removed. Old trees can sometimes be renewed by cutting the trunk about 8 inches from the neck, or vital node. The close shade prevents the rapid growth of weeds, which are cut out once or twice a year with a hoe or machete.

Very little commercial fertilizer is used, but in some areas growers plow under the berry pulp as fertilizer or bury all the weeds as green manure. A few large cultivators use commercial fertilizers. The Coffee Federation is encouraging their scientific use. Planters do use temporary diking to preserve humus and prevent erosion. The dikes are made of waste vegetable matter, which is washed away by the heavy rains and must be constantly replaced.



FIGURE 12.—Coffee tree ready for pruning.

HARVESTING

Coffee is harvested almost the year round, and it is not unusual to see flowers, buds, and fruit all on the same tree. There are, however, two main crops, the fall and winter crop and the spring crop. In the Departments of Antioquia, northern Caldas, Santander, and Magda-

lena, the large harvest comes during the last 3 months of the calendar year; the small harvest in April, May, and June. In the other districts, the large harvests are in the spring.

When the coffee plant is 3 or 4 years old clusters of delicate white flowers emerge from the axils of the leaf, and soon small clusters of oblong berries appear. The fruit begins to ripen in 6 or 7 months, turning first a brilliant red and, when ripe, a darker red. Two seeds, or beans, usually grow with their flat sides face to face in one of the dark, cherry-red, pulpy berries.

The harvesting of the berry is done by hand, and each berry is picked separately, only the ripe ones being taken. The plantation must be gone over again and again to be sure that the berries are picked at just the right stage of ripeness. In Brazil, where very little coffee is grown under shade, most of the crop is harvested at one time. The berries in varying degrees of ripeness can all be stripped from the tree at once. In some districts, notably the Sierra Nevada de Santa Marta, labor for harvesting is very scarce, and it has been estimated that 15 percent of the crop is sometimes lost because of labor shortage at harvesttime. Even with a shortage of labor, only ripe berries are picked, as a higher quality product is thus insured. Harvesting is therefore a slow process. One man rarely picks more than 45 pounds of berries, or about 10 pounds of cleaned coffee, in a day.

The best quality coffee is grown on the slopes of the Central Cordillera, where the yields are higher than in other regions. The average yield per tree for the entire country is about 1 pound of coffee, although in some small sections trees yielded 3 or more pounds (14). In the Eastern Cordillera, the yields are much lower, averaging about half a pound per tree.

FINANCING

Until 1931 the coffee planters depended on banks, brokers, and large buyers to finance their operations. The large growers were able to get funds from banks by mortgaging their property, but the small planters had difficulty in securing credit. They sometimes received advances on their crop from the broker or agent of a larger buyer.

In 1931 Congress established a Caja de Crédito Agrario y Industrial, which has branch offices, Sociedades Seccionales de Créditos, throughout the coffee regions. This institution makes 6-month loans to coffee planters of as much as 50 percent of the estimated value of the crop. The loan is secured by the land and carries an interest rate of 5 percent per annum. This bank is allowed to rediscount its paper with the Bank of the Republic.

The National Federation of Coffee Growers has established warehouses where coffee, as well as other crops, may be stored and loans received thereon. When there is a credit operation, the owner is given a certificate, or note of deposit, which is negotiable at the Bank of the Republic. The bank transacts this business at a rate 2 percent below ordinary transactions on 6-month terms. The crop receipts issued on the coffee delivered to the warehouse may be discounted at the Bank of the Republic for 75 percent of their value to provide funds for loans to the growers on their crop. These loans are made for 3 months at 3-percent interest and may be extended if the Federation and the bank agree. This method of financing the coffee crop is

becoming more and more popular. By June 30, 1940, the loans against coffee-warehouse receipts totaled 4.8 million pesos, or about 2.7 million dollars.

COST OF PRODUCTION

Costs of production are always hard to determine, particularly an average cost covering two or more establishments. In fact any cost-of-production figure for Colombia is subject to question because of the very inadequate data. However, a few estimates are made of out-of-pocket costs for various factors and operations. Costs of producing washed coffee are presented in the following tabulation⁸ based on the production of a thousand 8-year-old trees in the Department of Caldas:

| | <i>Cents</i> |
|---|---------------|
| Weeding (three times a year), at 23.75 pesos per 1,000 trees..... | 0.95 |
| Picking, at 60 centavos per arroba (25.36 pounds)..... | 1.32 |
| Depulping..... | .22 |
| Washing..... | .26 |
| Drying..... | .31 |
| Interest on investment at an average of 20 pesos per 1,000 trees..... | .69 |
| Administration, at 18 pesos per 1,000 trees..... | .62 |
| Total per pound..... | 4.37 |
| Total per bag of 60 kilograms (not including cost of bag)..... | 578.05 |

The production costs of unwashed coffee are the same for weeding, picking, and interest on investment. The administration cost is cut in half, and the total cost per pound is reduced to 3.26 cents. Over 90 percent of Colombian coffee, however, is sold as washed coffee.

It has been estimated that the entire processing cost for coffee in the treating plants, or trilladoras, at Girardot is 85 centavos (45 cents) per bag of 62½ kilograms, or 0.3266 cents a pound.

MARKETING (31)

PREPARATION FOR SALE

After the berries are harvested, they are cleaned, dried, and prepared for hulling on the farms. The "wet" method of cleaning is generally used in Colombia, that is, the beans are removed from the berries before they are dried.

The berries are soaked in water before being depulped. They are put through a pulping machine to remove the outside skin and pulp, each berry yielding two coffee beans. The beans are then allowed to ferment in large cement tanks from 12 to 36 hours to remove the sugary substance clinging to them. They are washed again in a washer or in cement canals (fig. 13), tanks, or special canoes in constantly changing clear water. The water and friction remove the rest of the pulp, and the beans are ready for drying (fig. 14). On the smaller plantations, the beans are spread several inches deep on open-air concrete drying floors or in buildings with removable roofs to dry in the sun. The beans are raked constantly (fig. 15) to insure uniform drying. Drying usually requires less than a week. On some plantations the beans are dried in mechanical dryers by blasts of hot air.

⁸ PEDERSON, ALFRED J., and WRIGHT, JAMES H. BASIC COFFEE REPORT FOR THE REPUBLIC OF COLOMBIA. U. S. Cons. Rpt. 22523, 23 pp. 1938. [Typewritten.] Conversions made from pesos at average 1938 exchange rate of 1 peso = 55.95 cents.

The beans are now ready to be hulled. The smaller growers usually sell their coffee at this stage, when it is known as *pergamino*. About 80 percent of the total crop goes to the large *trilladoras*, or treating plants, where the *pergamino*, or parchment hull, is removed and the

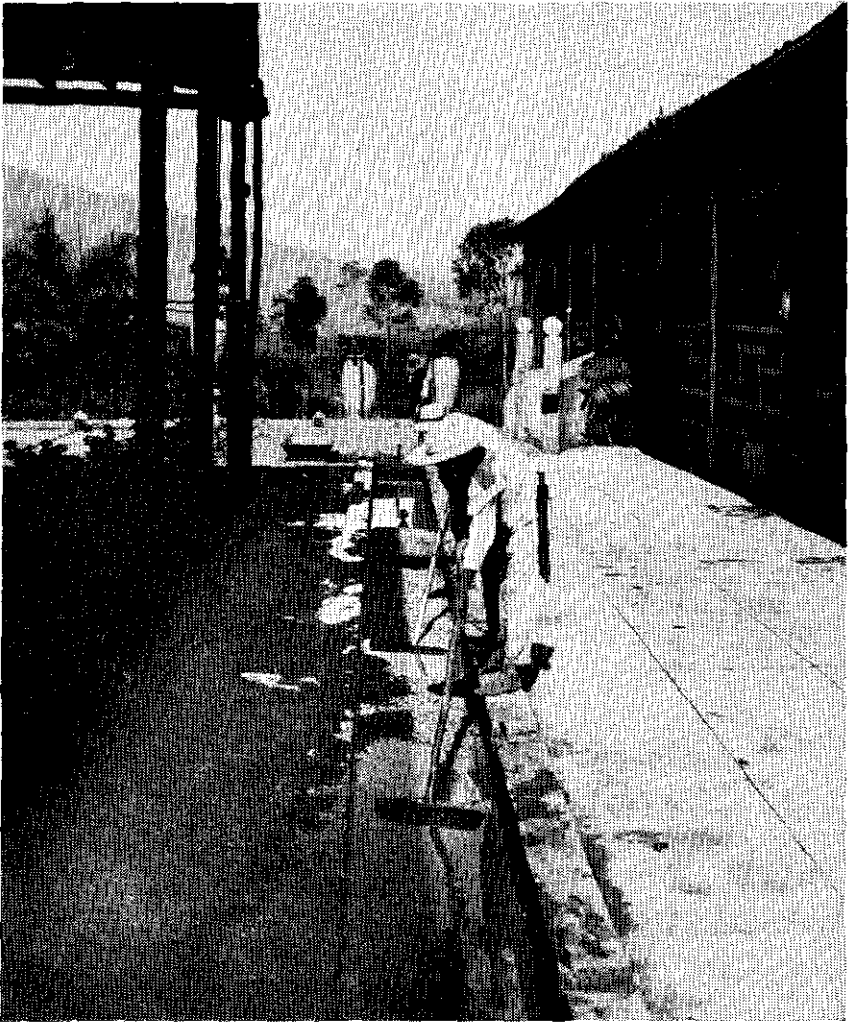


FIGURE 13.—Washing coffee in a canal.

beans are polished and graded. The larger plantations are equipped with treating plants to handle the coffee through to the final grading.

The Colombian beans are a rich olive green. They are classified carefully according to size, shape, weight, and color and packed in fique bags of from 60 to 70 kilograms (132 to 154 pounds); they are then ready for exportation. Only the coffee for domestic consumption is roasted in Colombia.

GRADES AND TYPES

The names of the different types and grades of coffee in Colombia have come primarily from the chief market centers where the coffee is sold. The Manizales, Medellín, and Armenia coffees are by far the most important in the trade, accounting for 55 percent of the total.

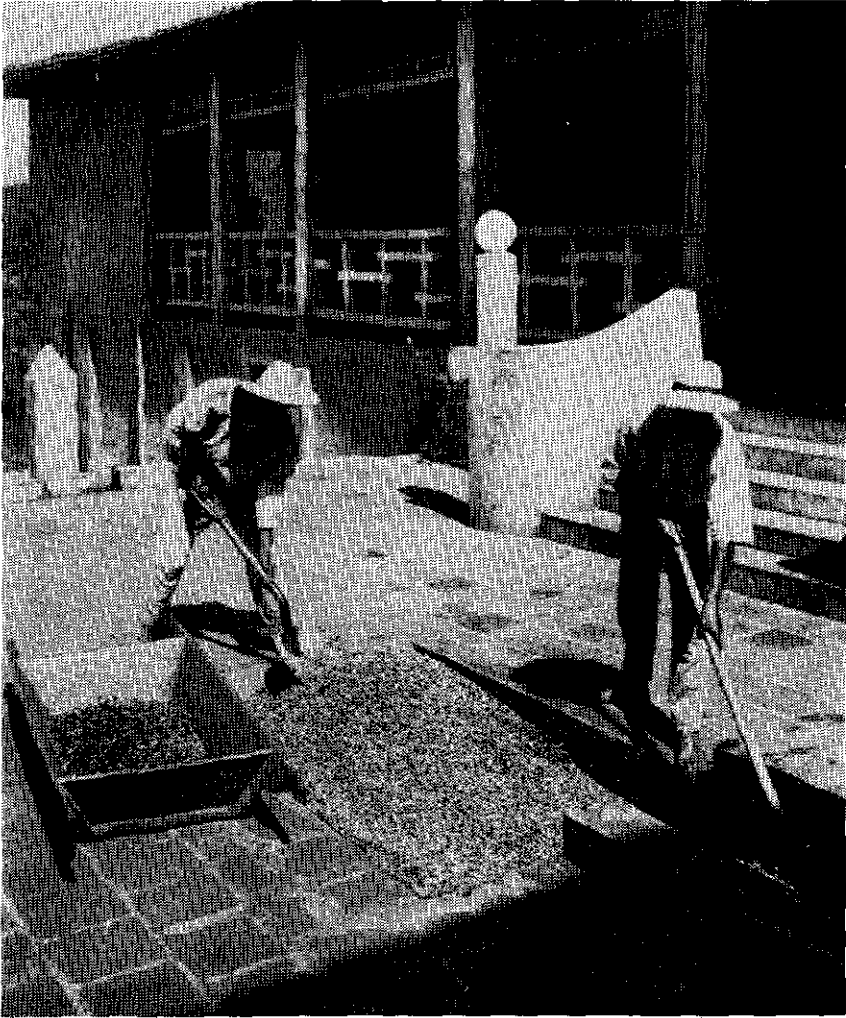


FIGURE 14.—Transferring washed coffee to a handbarrow.

The relative importance of the different types is indicated by the 1938 export figures (table 18). The type that brings the best price on the market is the Medellín from the Department of Antioquia.

There are several different grades of coffee within each type classification (see fig. 16). The five principal grades of Medellín are the Excelso, Primera, Caracol, Segunda, and Consumo. About 75 percent of the crop is Excelso, the top grade. The Manizales coffee for

export from the Department of Caldas is divided into Excelso, about 90 percent of the total, and Consumo. Other types are divided into two and sometimes three grades. The Excelso grade makes up about 90 percent of total coffee exports. The inferior grades are used largely for local consumption.

TABLE 18.—Types of coffee exported from Colombia as percentage of total, 1938

| Type | Exports | Type | Exports |
|-----------------|---------|-------------------|---------|
| | Percent | | Percent |
| Manizales | 21.6 | Cúcuta | 5.1 |
| Medellín | 19.3 | Líbano | 4.2 |
| Armenia | 14.2 | Sevilla | 3.7 |
| Girardot | 9.3 | Tolima | 2.9 |
| Cumbre | 6.0 | Bucaramanga | 2.5 |
| Bogotá | 5.1 | | |

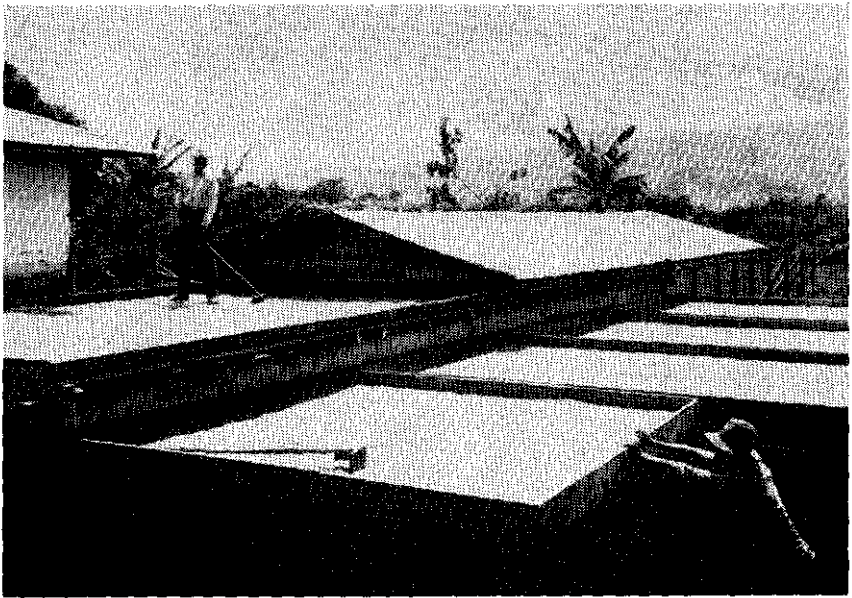


FIGURE 15.—Drying coffee.

By law the National Federation of Coffee Growers is responsible for establishing the standard grades, and penalties are provided for failure to mark the coffee properly. The Federation inspects all coffee for export for proper classification, grade, and markings. The Department of Antioquia has gone farthest in standardizing its product and is building up a fine reputation for the Medellín coffee (31).

METHODS OF SALE

The small planters usually market their crop either through local brokers in the small towns or through the National Federation of Coffee Growers. A few of the larger growers sell direct to the agent of the foreign coffee buyers. Local brokers advance money to

the planter on the estimated crop and at harvesttime take the coffee in payment. They in turn sell the product to larger buyers in the coffee centers. The largest proportion of the coffee is bought by representatives of foreign coffee firms, the American firms usually purchasing through Colombian brokerage houses. European sales are made through a commission house on consignment.

The Federation sometimes buys the coffee outright from the planter, either with or without the parchment covering. The Federation also receives coffee for warehousing and helps the planter to secure the best price for his product when it is sold. It pays freight charges

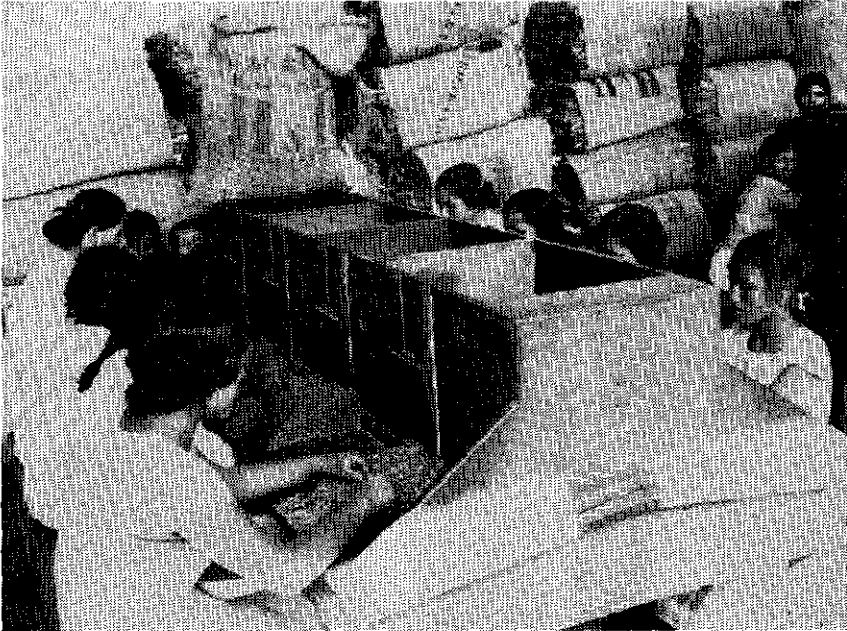


FIGURE 16.—Sorting coffee.

from the plantation to the warehouse, loans or sells sacks for shipping the coffee, and insures the product against fire, theft, and loss after receiving it for storage.

Until the past few years, Colombian coffee was shipped in imported jute bags; but under the protection of a high import duty on jute, the domestic fique fiber has been coming into general use. The giant lily, which produces fique fiber, or mauritius hemp, is grown in most Departments, although the region around Bucaramanga is the most important bag-making center.

TRANSPORTATION

Transportation over the whole of Colombia is inadequate, and the movement of the coffee crop is hampered by the lack of modern methods. The majority of the coffee plantations are located on steep and rugged hillsides at a considerable distance from rivers, railways, or roads. Most of the coffee moves from the farm to the railways, cable-

ways, and highways, by mule pack (fig. 17) or oxcart over narrow mountain trails. The product is loaded and reloaded many times before it reaches the port of embarkation. The roads and railways are usually very short, and it is necessary to transfer the product from one to another, or to an entirely different mode of transport. The

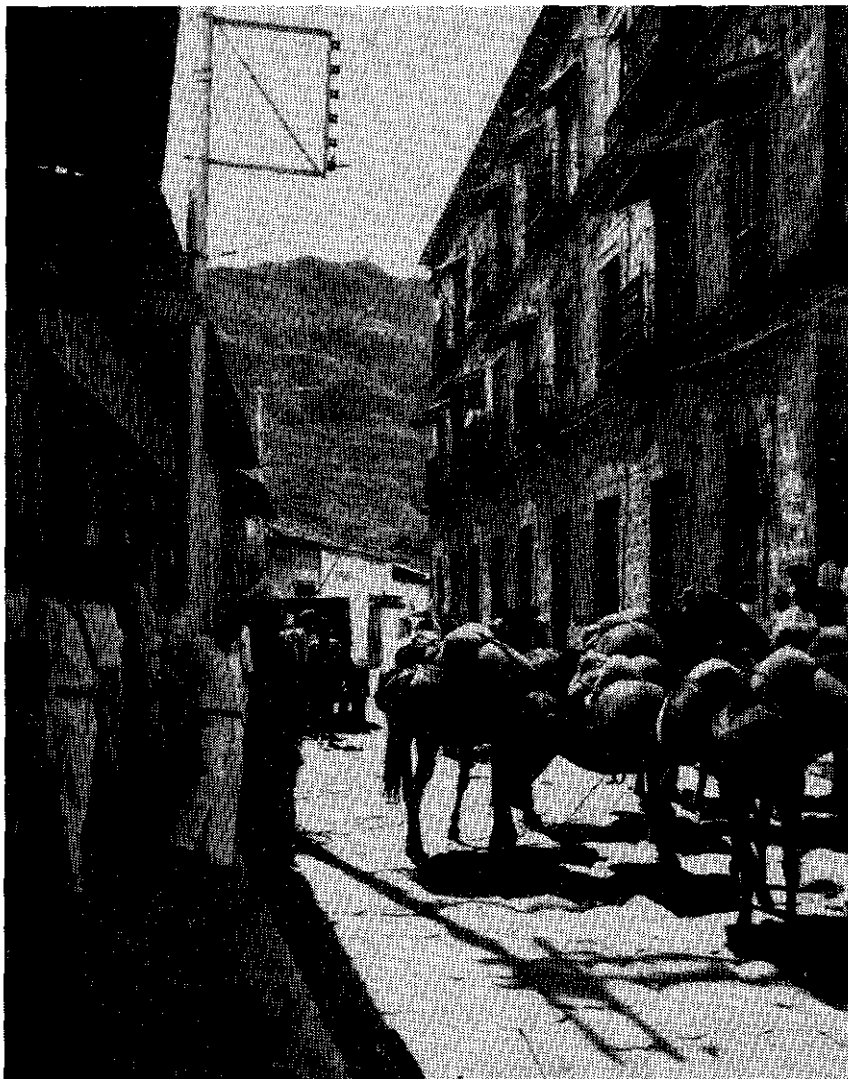


FIGURE 17.—Mules bringing coffee to market.

Magdalena River serves as the principal means of carrying the product to the seaports. Coffee taken by rail, road, cableway, and mule pack is unloaded along the river bank to wait for a steamer going down the river. The uncertainties of the river make it impossible to determine when the coffee will reach port. When the river

is high, it moves fairly well, although even then the coffee from highland regions must be reloaded from the small upstream boats to the larger steamers on the lower Magdalena, and the trip requires about a week. In the dry season it sometimes takes 5 or 6 months for a shipment of coffee to travel from the farm to port.

A little over half the coffee is moved to ports on the north coast, most of this coffee coming down the Magdalena (fig. 18). The Antioquia Railway, La Dorada Railway, and the Puerto Wilches Railway carry the coffee to points along the Magdalena, where it is loaded onto the steamers for the journey to the sea. A little coffee from the Sierra Nevada de Santa Marta region travels by rail to the port cities. The Pacific port of Buenaventura has become increasingly

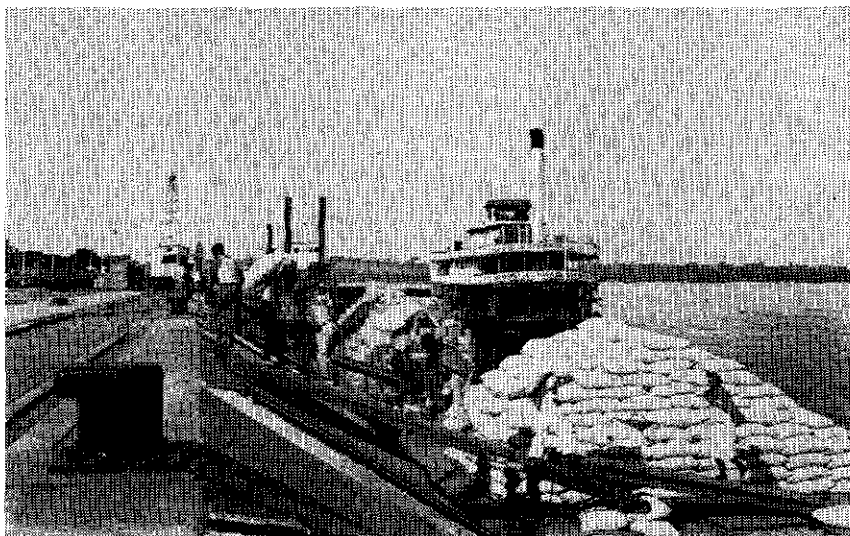


FIGURE 18.—Loading coffee at Puerto Berrio on the Magdalena River.

important in recent years with the establishment of railways from the highland region to the Pacific, and more and more coffee moves over this route on the Pacific Railway and Caldas Railway.

The principal coffee centers throughout the country, together with the distance coffee must travel from them to the seaport, are given in appendix table 45.

The freight rates on the river vary with supply, demand, and river conditions, although coffee carries the lowest rate. The transportation cost from the farm to the local market is estimated at \$1.70 a short ton, and the additional transportation cost to the port of embarkation varies from \$8.50 a ton from La Dorada to Cartagena to \$19.15 from Medellín to Puerto Colombia. The insurance tariff on a ton of coffee also varies for the different shipping points, the rate from Medellín to Puerto Colombia being 0.45 percent, from Bogotá to Cartagena 0.72 percent, and from Cúcuta to Puerto Colombia 0.81 percent. From Cali to Buenaventura on the Pacific, the rate is 0.09 percent, and from Ibagué to the same port 0.36 percent. A breakdown of the transportation cost of a ton of coffee moving from

Medellin and from La Dorada (the highest and the lowest cost routes) is given below.⁹

| | <i>Medellin to Puerto Colombia Dollars</i> | <i>La Dorada to Cartagena Dollars</i> |
|--|--|---|
| Rail (or cable) freight..... | 10.67 | --- |
| River freight, including loading and unloading..... | 4.07 | 4.97 |
| Canalization charge..... | .52 | .52 |
| Railway freight on the coast..... | .73 | --- |
| Wharfage on the coast..... | .52 | .52 |
| Commissions and stamps on river or railroad bills of lading..... | .36 | .13 |
| Reweighing and dispatching of certificate..... | .25 | .25 |
| Export duty..... | .86 | .86 |
| Insurance to seaport against partial damage..... | 1.07 | 1.10 |
| Miscellaneous expenses..... | .10 | .15 |
| Total cost per ton..... | 19.13 | 8.50 |

When the coffee reaches the port, it is transferred to the ocean steamer by dock hoists or ship's tackle. American ships carry most of the cargo. The freight rate from Puerto Colombia to New York is about 62½ cents per 100 pounds.

STORAGE

Coffee is a product that can be stored for relatively long periods without deteriorating if protected from the weather. However, there has never been a need for prolonged storage from one season to another, since the crops have ordinarily moved to market currently. Since 1929 the Federation has been establishing warehouses throughout the coffee regions to take care of the product for the planters, particularly the small ones who are not financially able to hold their crop for any period after it is harvested.

The coffee usually is not held for any length of time. At the seaports of Barranquilla and Buenaventura there are Government warehouses, where the coffee may be stored for a time. In the former city coffee can be held free of charge for 60 days, in the latter for 10 days, after which time the charge is 83 cents a ton per day.

AIDS TO THE INDUSTRY

Since the coffee industry is the mainstay of the Colombian economy, it has naturally received more attention from both public and private agencies than other industries. The Government recognized the importance of coffee growing early in the nineteenth century and took action to protect the distinctive product being developed there. It is difficult to separate Government and private action to aid the industry since the two are closely related.

COOPERATIVE ASSOCIATIONS

From time to time, associations of coffee growers have been established in Colombia, some on a Nation-wide and some on a departmental basis. As a result of the cooperative effort of the growers, several national coffee congresses have been held, looking toward

⁹ See reference cited in footnote 7. Conversions made from pesos at average exchange rate for July 1941, 1 peso = 56.9806 cents.

improvement throughout the entire industry. The first of these congresses in August 1920 was called by the *Sociedad de Agricultores de Colombia*, which represented the growers. No specific action was taken at this congress, but the second congress in June 1927 (called by the *Sociedad Antioqueña de Agricultores*) secured the passage of a law establishing the National Federation of Coffee Growers. The National Congress of Coffee Growers became a part of the governing organization of that body.

The third congress met in February 1929 and, among other things, passed resolutions urging the Agricultural Mortgage Bank to simplify and facilitate mortgage loans on coffee properties and recommended the establishment of an agricultural bank.

The National Federation of Coffee Growers is a semi-official agency and the only organization in Colombia that attempts to coordinate the various parts of the industry. The Federation is composed of planters, brokers, and bankers interested in coffee. There are about 35,000 growers registered as members (20).

The Federation is under the supervision of the Ministry of Industries. A contract between the Government and the Federation was signed in April 1928 for a period of 10 years; it was renewed in June 1938 for another 10-year period. The affairs of the Federation are directed by:

(1) The National Congress of Coffee Growers, consisting of the Ministry of Industries and delegates from the Departments, appointed on the basis of their coffee exports;

(2) The National Committee of Planters, composed of the Ministers of Agriculture and Commerce, Foreign Relations, and Finance and Public Credit, the manager of the Agricultural, Industrial, and Mining Credit Bank, a representative of the Agricultural Mortgage Bank, and five directors elected by the Congress;

(3) Departmental committees in the coffee-growing regions;

(4) Municipal boards of three members each;

(5) The officials of the Federation.

The Federation is to perform the following services:

(1) Maintain active, scientific propaganda for Colombian coffee;

(2) Introduce into the country the best methods of plant cultivation;

(3) Establish general warehouses;

(4) Send experts to other countries to study their methods of cultivation, sale, expansion of consumption, etc.;

(5) Encourage the establishment of roasters for Colombian coffee in the interior of the country (using up to 30 percent of the proceeds of a tax on exports for this purpose);

(6) Edit a monthly magazine or publication medium for information of the society;

(7) Publish statistics of industry and maintain information;

(8) Guide the exports of coffee to various markets.

Since its origin, the Federation has established warehouses at Armenia, Barranquilla, Bogotá, Bucaramanga, Cali, Cúcuta, Girardot, Honda, Ibagué, Manizales, Medellín, Pereira, Pasto, Popayán, and Neiva. It has agencies in 16 cities in Colombia, as well as in New York, New Orleans, Paris, and Hamburg.

The warehouses take commodities produced in the country for storage and marketing, making loans on the security of the commodity at a low rate of interest. Loans may be made up to 75 percent of the value of the stored crop in the case of coffee, cotton, and salt, and from 40 to 70 percent of the value of other crops stored. They facilitate the distribution of domestic products to the consuming centers of the country and keep information on internal as well as external markets. Warehouses also prepare coffee for export. Though authorization is made for storage and loan operations on many domestic products, the major part of the business of warehouses (approximately 90 percent) is in connection with the coffee industry.

The Federation has established experiment stations in different parts of the country. The central station is located at La Esperanza, Cundinamarca; and smaller stations, or coffee granges, are scattered throughout the coffee-growing regions.

The central station at La Esperanza devotes itself to soil and plant research, collection and dissemination of weather data, training of workers, and experimentation with methods of cultivation and use of machinery. The work of the granges consists principally of instructing the planters in methods of planting, cultivating, and management of the farm. The departmental coffee committees furnish most of the funds to carry on the grange work, supplemented in some Departments by governmental appropriations.

GOVERNMENT POLICIES

The chief Government measure to aid the coffee industry before the present war was the establishment of an export tax on coffee. By authority of a law of 1927 an export tax of 10 centavos per bag of 60 kilograms was levied on coffee. The funds derived from the tax were used by the Federation to promote the industry. The tax was changed in 1937 to 25 centavos per 70 kilograms. This law also imposed a tax on drafts received from the sale of coffee. The funds from this tax could also be used by the Federation for expenditures in connection with the promotion of Colombian coffee. The Government discontinued the collection of the tax on coffee drafts on August 1, 1939. The export tax was also discontinued, and a 2-peso premium was paid on each bag of coffee exported from May 1940 to December 31, 1940, from the proceeds of the Coffee Premium Board.

Until the beginning of the present war, there was no national, departmental, or municipal duty on the internal consumption of coffee. No quotas or production and price controls had been established, nor had there been a need for them. Colombian coffee had been much in demand to blend with other coffees, particularly in the United States market. Until the war cut off much of the European market, Colombia was able to sell the entire crop of coffee at prices higher than Brazilian coffee could demand.

After the war started in September 1939, the position of the coffee-growing countries became more and more unsatisfactory; and as the European market dwindled, stocks of coffee began to accumulate for the first time in Colombia. After much study and

after several temporary measures had been taken, a comprehensive program for the coffee industry was established by law on November 21, 1940. This law, together with the decrees issued under it, regulates the coffee trade, establishes new taxes, sets up a national coffee fund of 10 million pesos to be used to purchase surplus coffee, and authorizes an internal bond issue to provide the coffee fund. The fund is administered by a commission, which may fix an official daily price for coffee, based on conditions in foreign markets. The National Coffee Federation made purchases late in 1940 and in 1941 on the basis of the official price, which was higher than the New York price, thus forcing exporters out of the market. An exchange tax payable on all receipts from coffee exports in excess of specified f. o. b. prices was established.

In order to comply with the quotas set by the International Coffee Agreement, signed in the fall of 1940, the Government prohibited the sale of the two lowest grades of coffee, known as sweepings, which made up the largest part of domestic consumption. A stiff penalty was imposed to insure that this grade of coffee was not used. The next two grades, Consumos and Pasillas, usually exported as low-grade products, are now favored for domestic use, and a tax of 5 pesos per sack is placed on the exportation of these grades. Sweepings have run from 80,000 to 100,000 sacks a year, exported Consumos have ranged from 79,000 to 137,000 bags and Pasillas from 57,000 to 174,000 bags. Even if all the sweepings were taken off the market and replaced by Pasillas and Consumos, there would still be a large excess supply of these grades.

Further to insure strict compliance with the quota provisions of the agreement, exports of coffee were placed under license. The Office of Export and Exchange Control and the National Federation were charged with the responsibility of curtailing exports in line with quota restrictions.

INTERNATIONAL COFFEE AGREEMENT¹⁰

Even though Colombia has had no carry-over of coffee, at least until the present war, the other major producing country, Brazil, has been suffering from overproduction for many years and had already taken steps to decrease its supplies.

International cooperation in adjusting the coffee supply to market demands has been proposed many times. The closing of European markets by the present war has greatly aggravated the problem of overproduction. During the conference of Inter-American states at Habana in July 1940, a resolution was adopted looking toward cooperation among the coffee-producing countries. A coffee conference was held in New York in the summer of 1940 to explore the possibilities of cooperation. All the coffee-producing countries of the Western Hemisphere, as well as the United States—the chief consumer—were represented. In November the representatives of the various countries reached an agreement, which included a system of quotas covering the 1940-41 year, October 1 to September 30. The United States consumption was estimated and quotas allocated to each of the producing countries. In addition to quotas for the

¹⁰ GIBBS, J. BAIRD. THE INTER-AMERICAN COFFEE AGREEMENT. Foreign Agr. 5: 165-171. 1941. [Processed.]

United States market, quotas were established to take care of any additional markets that might be found.

The administration of the agreement and adjustments in quotas are under the direction of an Inter-American Coffee Board, composed of delegates from the participating countries. Of the total of 36 votes to be exercised by the delegates to the Board, Colombia controls 3 and the United States 12.

Colombia's quota for the United States market for the 1940-41 year was set at 3,150,000 bags of 60 kilograms net, 20 percent of the estimated total United States consumption, and for other markets at 1,079,000, 9 percent of the total allotted to other markets (table 19). The actual exports to the United States during the same period of the preceding year were 3,766,616 bags and to all other markets, 506,279 bags.

TABLE 19.—Colombian coffee quotas, 1940-41 and 1941-42 as compared with shipments, 1938-39 to 1940-41¹

| Market | Shipments | | | Quotas | | |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1938-39 | 1939-40 | 1940-41 | Basic 1940-41 | Revised 1940-41 | 1941-42 |
| United States..... | <i>Bags</i> 2,893,738 | <i>Bags</i> 3,766,616 | <i>Bags</i> 3,287,466 | <i>Bags</i> 3,150,000 | <i>Bags</i> 3,290,679 | <i>Bags</i> 3,497,980 |
| Other..... | 795,311 | 506,279 | 276,216 | 1,079,000 | 1,079,000 | 1,079,000 |
| Total..... | 3,689,049 | 4,272,895 | 3,563,682 | 4,229,000 | 4,369,679 | 4,576,980 |

¹ In bags of 132.276 pounds.

On June 1, 1941, the original quotas for shipment to the United States market for the remainder of the 1940-41 coffee year was increased by 5 percent. Again on August 2, the Inter-American Coffee Board authorized a further increase of 20 percent of the basic quotas for the remainder of the quota year. This raised Colombia's quota for United States consumption to 3,290,679 bags. Actual shipments during the quota year were 3,287,466 bags.

Quotas for the new year 1941-42 were revised in October. For United States consumption the quantities are to be 125 percent of the basic quotas from October 1 through October 23 and 110 percent of basic quotas for the rest of the year. Colombia may ship to the United States under the agreement 3,497,980 bags of coffee (462,698,802 pounds) from October 1, 1941, to September 30, 1942.

TRADE

Coffee in Colombia is produced for the export market—a market that has been expanding steadily for some years. Figure 19 (see also appendix table 46) shows the striking upward trend in exports from 630,000 bags (84 million pounds) in 1906 to 4.5 million bags (595 million pounds) in 1940. There has never been a carry-over of coffee from one crop year to the next in Colombia, as there has in Brazil, although the closing of European markets by the war may cause one. The uniformly high quality of the product has apparently been a major factor in holding up the market for Colombian coffee, even in the depression years.

The United States is the largest market for Colombian coffee, taking from 70 to 97 percent of the total. (Data on destination of coffee exports are taken from the records of the National Federation of Coffee Growers rather than from official publications on Colombian exports because the latter show merely the place of shipment rather than the final destination. For example, in some years large shipments are made to Venezuela that are destined for transshipment elsewhere, largely to the United States.) Coffee comes into the United States free of duty, and by the terms of the reciprocal trade agreement signed with Colombia in 1934 coffee is bound on the free list. The United States market for Colombian coffee has grown steadily for many years, increasing with the total exports of coffee, except for a leveling off during the middle 1930's.

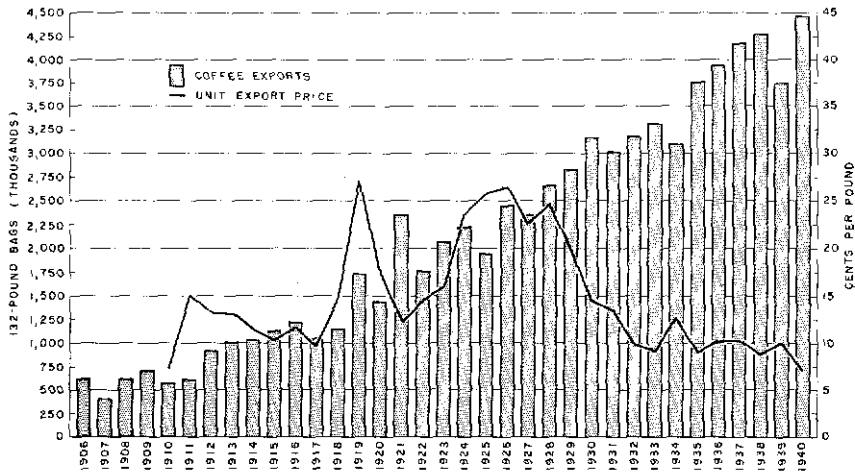


FIGURE 19.—Colombian coffee exports and unit export price, 1906-40.

TABLE 20.—Proportion of Colombian coffee exports taken by principal markets, 1915-40

| Year | United States | Total Europe | Germany | Year | United States | Total Europe | Germany |
|------|------------------|------------------|------------------|------|---------------|--------------|---------|
| | Percent | Percent | Percent | | Percent | Percent | Percent |
| 1915 | 88.1 | 10.6 | (¹) | 1928 | 90.0 | 9.6 | 2.1 |
| 1916 | 96.7 | 2.1 | (¹) | 1929 | 92.4 | 6.5 | 1.8 |
| 1917 | 87.7 | 12.2 | (¹) | 1930 | 91.6 | 7.1 | 1.9 |
| 1918 | 89.0 | 10.7 | (¹) | 1931 | 91.2 | 7.8 | 2.5 |
| 1919 | 93.1 | 6.7 | .1 | 1932 | 88.1 | 11.0 | 3.1 |
| 1920 | (²) | (²) | (²) | 1933 | 84.0 | 14.5 | 5.7 |
| 1921 | (²) | (²) | (²) | 1934 | 83.1 | 15.2 | 7.0 |
| 1922 | 94.2 | 5.4 | .4 | 1935 | 75.8 | 21.8 | 15.5 |
| 1923 | 97.2 | 2.7 | .2 | 1936 | 70.8 | 26.1 | 21.7 |
| 1924 | 95.4 | 4.3 | .7 | 1937 | 76.2 | 18.6 | 14.0 |
| 1925 | 94.5 | 5.2 | 1.1 | 1938 | 78.9 | 17.4 | 14.9 |
| 1926 | 94.9 | 4.4 | 1.1 | 1939 | 83.5 | 11.6 | 8.1 |
| 1927 | 89.7 | 9.5 | 2.8 | 1940 | 93.6 | 1.4 | ----- |

¹ Included in total Europe.

² Data not available by countries. Federación Nacional de Cafeteros de Colombia (15).

The trend in the relative position of the United States as a market for Colombian coffee shows a decided dip during the middle 1930's,

rising again in 1938 and 1939 and shooting much higher in 1940. The rise in both the absolute and the relative quantity taken by the United States during the World War of 1914-18 is being repeated again as a result of the current conflict. Canada has increased its share of the total recently, taking 4.6 percent in 1940. In fact the United States and Canada have been almost the only markets for coffee shipments during the war months (table 20).

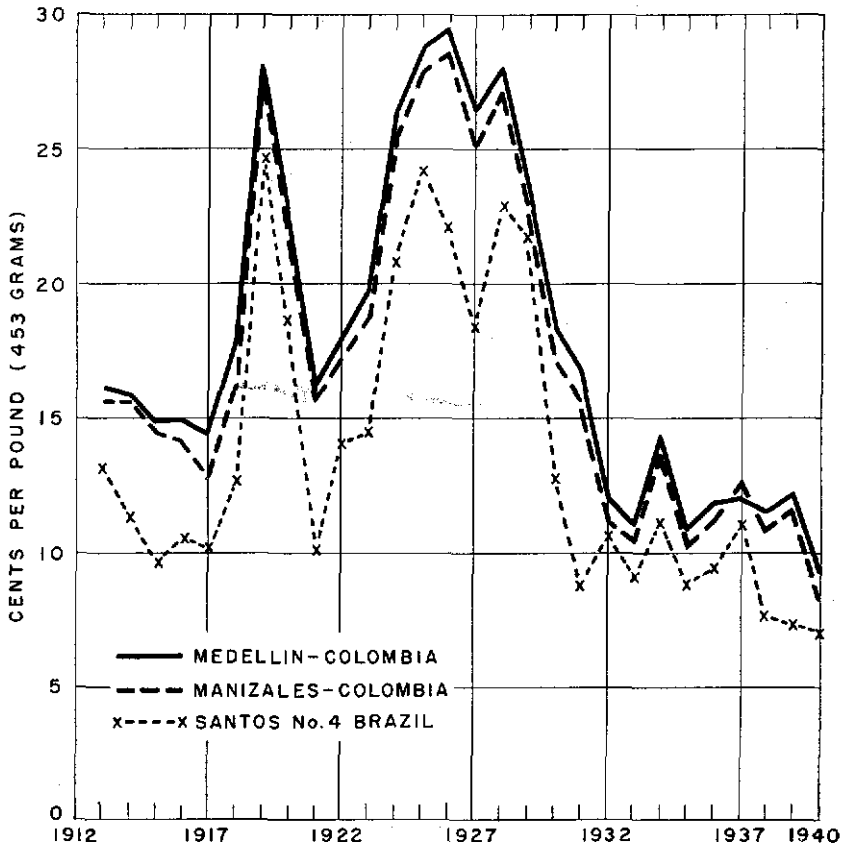


FIGURE 20.—Price of coffee on the New York market, 1913-1940.

PRICES

Colombian coffee has always sold at a premium over Brazilian coffee on world markets because of its mild flavor and superior quality. Practically all the export grades have topped the prices of Brazilian coffees in the New York market, and prices of the more important Medellin and Manizales coffees have been significantly higher (fig. 20).

In general, coffee prices have followed the general cycle of raw-material prices. They reached high peaks in 1920 and again in the middle 1920's, with low prices in 1921 and during the depression years of the 1930's. In common with prices of other raw materials

and the agricultural price level, coffee prices started their downward spiral in 1929 ahead of the general business slump.

It is difficult to obtain an average farm price of coffee in Colombia. However, the internal price of several different grades is available. The average internal price of Medellín coffee has varied over the past 5 years from 13.6 to 17.6 centavos a pound, or from 7.8 to 10 cents. The margin between the internal price and the New York quotation ranged from 1.44 to 2.44 cents during the same period. The transportation cost alone from Medellín to New York City is estimated at about 1.6 cents a pound.

The trend of the unit export price, expressed in United States currency, follows very closely the New York market prices for Medellín and Manizales, although the average price is, of course, somewhat lower, since it includes the lower priced grades (table 21). Insofar as the planter uses his income to purchase imported goods, it is the price of coffee in United States currency that determines how much of the foreign product his coffee crop will bring him. Lately, the lower price of coffee has made it necessary to ship larger quantities to obtain the same amount of purchasing power as during the middle 1920's.

TABLE 21.—Prices of Colombian coffee, 1913-1940

| Year | Unit export price | | Internal price of Medellín | | Average price on New York market | | |
|------|-------------------|-------|----------------------------|-------|----------------------------------|----------------------|-----------------------|
| | | | | | Medellín (Colombia) | Manizales (Colombia) | Santos No. 4 (Brazil) |
| | | | | | Cents per pound | Cents per pound | Cents per pound |
| 1913 | 30.30 | 13.28 | | 16.21 | 15.63 | 13.17 | |
| 1914 | 26.26 | 11.44 | | 15.98 | 15.60 | 11.46 | |
| 1915 | 24.21 | 10.32 | | 14.91 | 14.50 | 9.57 | |
| 1916 | 26.89 | 11.84 | | 14.97 | 14.18 | 10.55 | |
| 1917 | 21.76 | 9.18 | | 14.44 | 12.92 | 10.16 | |
| 1918 | 30.30 | 14.52 | | 17.67 | 16.38 | 12.71 | |
| 1919 | 54.28 | 27.23 | | 28.22 | 27.67 | 24.78 | |
| 1920 | 42.36 | 17.32 | | 22.66 | 21.50 | 18.72 | |
| 1921 | 30.11 | 12.03 | | 16.33 | 15.55 | 10.05 | |
| 1922 | 34.63 | 14.51 | | 17.98 | 17.42 | 14.13 | |
| 1923 | 36.82 | 15.90 | | 19.63 | 18.76 | 14.50 | |
| 1924 | 52.49 | 23.61 | | 26.46 | 25.50 | 20.92 | |
| 1925 | 57.53 | 25.93 | | 28.98 | 27.93 | 24.26 | |
| 1926 | 58.91 | 26.30 | | 29.56 | 28.54 | 22.13 | |
| 1927 | 50.66 | 22.45 | | 23.46 | 25.08 | 18.47 | |
| 1928 | 55.81 | 24.74 | | 28.13 | 27.26 | 22.94 | |
| 1929 | 45.64 | 19.99 | | 23.63 | 22.81 | 21.84 | |
| 1930 | 32.71 | 14.32 | | 18.44 | 17.24 | 12.88 | |
| 1931 | 30.62 | 13.41 | | 16.85 | 15.55 | 8.75 | |
| 1932 | 32.68 | 9.80 | | 12.25 | 11.35 | 10.59 | |
| 1933 | 24.94 | 9.24 | | 11.05 | 10.46 | 9.12 | |
| 1934 | 45.01 | 12.61 | | 14.41 | 13.70 | 11.11 | |
| 1935 | 35.39 | 8.97 | | 10.85 | 10.26 | 8.88 | |
| 1936 | 39.27 | 10.16 | 16.84 | 9.61 | 11.90 | 9.45 | |
| 1937 | 40.03 | 10.30 | 17.51 | 9.93 | 12.19 | 11.04 | |
| 1938 | 34.99 | 8.88 | 16.21 | 9.07 | 11.51 | 7.66 | |
| 1939 | 39.22 | 10.15 | 17.55 | 10.01 | 12.30 | 7.41 | |
| 1940 | 27.77 | 7.19 | 13.61 | 7.77 | 9.21 | 7.05 | |

Contraloría General de la República de Colombia (5).

Following the outbreak of war in Europe, the price of coffee, including that for Colombian grades, declined steadily through the summer of 1940. Figure 21 shows the rapid month-by-month decline in the New York price of the two top grades of Colombian coffee

through May 1940 and the continued low level during the following summer.

In the fall of 1940 the Colombian Government decided to take definite steps to stop the downward movement in prices. In November an "official" price was set in Colombia for all grades of coffee and the internal price was maintained by purchases through the National Federation at this price. Between November 1940 and March 11, 1941, the official price was increased 11 times, the increases ranging from 25 to 45 percent. In November the International Coffee Agreement was signed by the coffee-producing countries. The agreement tended to strengthen the price of coffee and, together with the governmental control measures in Colombia, influenced the New York quotations on Colombian grades. Figure 21 also shows the steady month-by-month

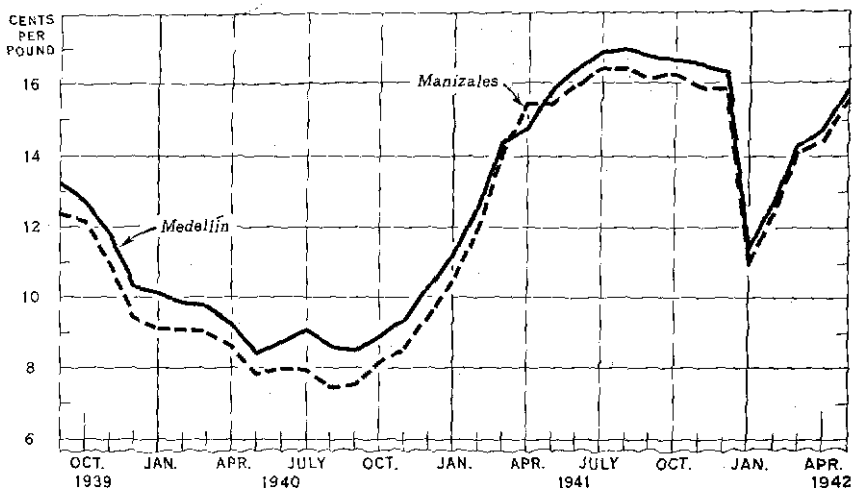


FIGURE 21.—Price of Colombian coffee on New York market, 1939-42.

rise in the price of Colombian coffee, especially during the months of 1941. Prices of Bogotá, Girardot, and Tolima coffees in June 1941 were twice what they were in June 1940.

FUTURE PROSPECTS

Charting the future course of any industry is difficult and highly uncertain, even in normal times. In the midst of a world-wide war, it is well-nigh impossible. There are, however, a few facts to guide us in forecasting future trends.

With the closing of the European markets to coffee from all the coffee-producing countries of the Western Hemisphere, the United States remained the only major outlet for coffee. Coffee consumption has been increasing in Canada, and that country has been taking an increasing quantity from Colombia. However, this market still absorbs only an insignificant proportion of the available supply. Unless the people of the Western Hemisphere increase their consumption of the beverage, it is inevitable that coffee stocks will pile up in the producing countries. On the basis of the current quota allotment,

Colombia is assured of a market in the United States for about 75 percent of the crop. With the United States market allocated among the producing countries, excess stocks cannot be dumped into the market to depress the price. Other things being equal, it should be possible to maintain the New York price of the bean, at least for a time. If the New York price can be maintained at the relatively satisfactory levels reached in the spring and summer of 1941, Colombia's coffee exports will provide a fairly steady source of exchange for the purchase of goods abroad. A staple market for a major part of the crop should aid in carrying over the increasing stocks of coffee for a few years. If the current war does not last many years, the accumulated supplies could no doubt be disposed of in Europe. Colombia has no backlog of stocks from other years, and the position of the coffee industry is fundamentally good.

Since coffee is a tree crop and several years of waiting are required after planting before the tree produces a harvest and since it continues to produce for several years after coming into bearing, it is difficult to adjust supply to market needs. The Colombian Government is aware of its problem, however, and is working constantly to devise new and improved aids for the industry to help it weather the current difficulties. During the course of a long war, stocks are likely to accumulate, and production may have to be curtailed. As the number of new trees planted fails to keep pace with the number becoming too old to produce, the resulting decrease in the number of producing trees may tend to reduce the importance of coffee in the total economy. However, since Colombia is so ideally suited for the production of fine coffee, it seems inevitable that coffee will continue to be a major source of income.

BANANAS ¹¹

The banana industry in Colombia originated in the Río Frío district about 30 miles from Santa Marta. Plantings there were commenced by combined English and American capital. The first shipment of bananas from Santa Marta was made on March 21, 1891. In these early years of the industry the crop went largely to New Orleans.

Plantings spread to Sevilla, and in 1899 various interests combined to form the United Fruit Company, which still has a virtual monopoly of the banana industry in Central America and the Caribbean. The Magdalena Fruit Company is the subsidiary of the United Fruit Company operating in Colombia.

The growth of commercial production in Colombia can be seen from the export data, which show an increase in exports from 90 million pounds in 1906 to a peak of 525 million pounds in 1926 (fig. 22, p. 75).

By 1920 the total plantings in Santa Marta had reached 30,000 acres. Recently plantings exceeded 150,000 acres (appendix table 42), and the banana fields of Santa Marta are among the largest and busiest in Latin America.

Export figures may in some years be a good indication of production, but in other years they may understate it considerably. Since

¹¹ The background material for this section was taken from various official and unofficial sources (9, p. 29-31; 26; 30).

the Fruit Company has a virtual monopoly of all bananas marketed, it does not ship the fruit if markets are not available. In 1931, during the depression, for instance, it made no shipments of fruit from July to September, and the bananas were allowed to spoil in the fields. The quantity of fruit rejected for shipment because it does not meet specifications also varies from time to time.

IMPORTANCE OF THE INDUSTRY

The banana is a staple article of diet throughout most sections of Colombia. A few plants are grown in the back yard of practically every rural home, especially in the tropical and subtropical regions, to provide food for family use. In addition to the importance of the banana as a food, it is one of the major commercial crops, being the second most important agricultural export. Even though the entire commercial crop is grown in the Santa Marta district, banana exports have averaged about 6 percent of the value of all exports. The relative importance of banana exports has declined somewhat since the World War, although the volume of exports continued to increase during the 1920's and is still larger than during the World War period.

For the Santa Marta region the banana industry is of major importance, since it provides the livelihood for 75 percent of the population and is the only industry of any importance in the section.

The Santa Marta banana area is one of the largest banana-producing regions in the world and has supplied from 6 to 10 percent of world exports recently. A few years ago it ranked second to Honduras as a source of banana exports; but during the past 2 or 3 years Mexican exports have topped the list, and Colombia dropped to fourth place in 1938. Colombian exports, however, still constituted 7.5 percent of total world exports.

DESCRIPTION OF THE INDUSTRY

LOCATION

After the introduction of the banana into the Santa Marta district of the Department of Magdalena, its cultivation spread rapidly throughout the country. The export industry, however, is still confined to the Santa Marta district. No production figures are available for the country, since bananas are grown in almost every garden for home consumption or sale in local markets.

The plantations of the Fruit Company stretch along the special railway owned by the company from the seaport of Santa Marta south to Fundación. The three main sections of the plantations are located at Río Frío, Sevilla, and Aracataca. The banana area extends for about 40 miles south of Ciénaga along the rich piedmont plain at the foot of the Sierra Nevada de Santa Marta.

NUMBER AND SIZE OF FARMS

Since 1900 the Magdalena Fruit Company has owned and cultivated most of the banana lands in Santa Marta. In the early days, the company owned all the banana lands, but gradually private owners have developed plantations in the Santa Marta district. By 1920 a little over half the planted area belonged to the Fruit Company, and the rest

was distributed among 275 private owners. These private holdings were small, few of them being as large as 1,000 acres and most of them ranging from 25 to 40 acres. The proportion of the total planted area owned by the company has declined to between 40 and 45 percent. The majority of the private holdings are still small.

At intervals during the development of the industry other companies have been organized in an effort to compete with the Magdalena Fruit Company, but they have not met with much success.

SOILS

The soils of this piedmont plain are very fertile. The streams from the mountains bring a load of fine soil material, which is added to the fields during the irrigation process. Along the streams the soils are fine, sandy, clay loams, the best being the sandy clay loams with 15 to 35 percent of clay. Good drainage makes this plain particularly favorable for bananas, since banana roots cannot withstand water covering for more than 3 days without rotting. The soils are also ideal for the growth of hardwood forests, which must be cleared before banana plantations can be started. After the land is cleared and planted and the drainage and irrigation ditches have been dug, the fields require little further care. When the stems have been harvested, the old tree is cut down and allowed to decompose to furnish fertilizer for the field. The fields are so productive that they have grown good bananas for 30 or 40 years without additional fertilizer. It is only in the past few years that commercial fertilizer has been used at all.

CLIMATE AND RAINFALL

Temperatures are high in this region, with only slight variation from month to month. They average about 72° F. at night and 89° during the day.

Annual rainfall varies from 35 inches near Río Frío to 65 inches at Fundación. During the two rainy seasons from April to June and from September to November, the rains come in the early afternoon in heavy showers.

IRRIGATION

During the rainy season irrigation is not necessary, but during the dry months the fields are irrigated every 30 days. There is an excellent supply of water from the mountains, where the rainfall is heavier and the rainy season lasts longer than on the plains. The higher mountains are covered with snow at all seasons and provide additional moisture for the lower elevations.

All of the bananas belonging to the United Fruit Company are grown under irrigation. The private commercial producers of the Santa Marta district use the facilities of the company to irrigate their plantations and pay a certain fee per acre for this privilege. The company has a system of canals, which utilizes the water descending in streams from the Sierra Nevada de Santa Marta east of the region.

The Government is authorized to take all steps necessary to control the waters of the banana zone. In January 1938 a commission

began work to determine the amount of irrigation water necessary for bananas and the quantity of water lost by filtration in the canals. The program includes supervision of the distribution of irrigation water according to the character of the soil, its permeability, etc.

VARIETIES

The banana is a member of the family Musaceae, which includes many species of the fruit as well as fiber plants like manila hemp. The two most important species of the fruit grown in the American Tropics are *Musa sapientum* L. and *Musa paradisiaca* L. The latter is known as the plantain, or cooking banana, and is cooked and eaten as a vegetable rather than a fruit. The Gros Michel variety of *Musa sapientum* is the commercially important product of Colombia.

PESTS AND DISEASES

Physical conditions in the Colombian banana area are so good that the fields have been relatively free from disease and pests as compared with those of the Central American countries. The Panama disease and the root borer are not so destructive in Colombia as in other Caribbean areas.

The most dangerous enemy of the banana in most producing fields at the present time is the sigatoka, or chamusco, disease, a fungus infection. It has not reached as dangerous proportions in Colombia as in Central America, but since late 1937, when it first appeared in Colombia, it has been spreading very rapidly. At first the plant experts in Colombia did not realize that the spots appearing on the banana leaves were the dreaded sigatoka, and it had made considerable headway before steps were taken to check it.

Soon after the first symptoms of the infection appeared in the zone, the plant pathologist of the Ministry of Agriculture was sent by the Government to study it in the fields. He later went to Jamaica with a Government agronomist and a banana expert to study the systems employed there to combat the disease. Later the Government brought a Mexican technical mission to study the situation.

In accordance with the studies made in 1938, the Government allotted 30 pesos (\$6.80 an acre) to carry on a campaign against the disease. This included the initial cost of dusting machinery, the necessary treatment for sick plants, and expenses and salaries of personnel. The sum of 30 pesos per hectare was borne equally by the National Government and the producers, who to take care of their share set aside a minimum of 20 percent of the proceeds of their sales of fruit until their quota was paid.

Now that the Magdalena Fruit Company has come to realize that the disease is spreading throughout the plantations, they have taken steps to install spraying equipment such as is usual in the Central American countries. From \$50 to \$60 an acre is being spent for equipment, which includes a piping plant for each 200 or 300 acres. In every direction from the plant the plantations are laid with 4-inch, 2-inch, and 1-inch galvanized pipes through which a copper sulfate solution is carried to small distributing blocks scattered every 30 feet over the entire plantation. Laborers are taught to attach a hose

spray to the distributing points and to spray the tree and the surrounding area, covering all parts of the leaves with the liquid. The liquid is pumped through the pipes under 600 pounds pressure. The Fruit Company is experimenting to learn just how often it is necessary to spray the plants, but as yet they have not reached any definite conclusions. At present the spraying is done every 15 to 21 days. Private planters with large acreages usually spray every 15 days to be sure to control the disease.

It has been found that young plants that are sprayed from the very first do not require attention as often as do the older plants that have already become infected. It is estimated that the cost of spraying, in addition to the initial cost, runs from 15 to 20 dollars a year per acre. However, if the spraying is not done, the value of the land for banana production falls to almost zero, for the disease cuts production drastically.

EQUIPMENT AND LABOR

The universal tool for cultivation in Colombia is the machete, and it is used extensively in the banana fields. Originally the clearing of the land was all done with the machete, and it is still used to some extent for this purpose as well as to keep the weeds down and to harvest the stems. The land is now generally cleared for planting with caterpillar tractors and disks, especially the lands owned by the Fruit Company.

Now that the sigatoka disease is becoming dangerous in the Santa Marta region, it is necessary to install elaborate spraying equipment to control the disease. This increases the per-acre investment and encourages more intensive cultivation.

The Santa Marta district is almost the only place in Colombia where much hired agricultural labor is used. The lands of the Fruit Company, which produce 40 to 45 percent of the crop, are worked by hired laborers, the force averaging about 3,000. Small independent growers employ an additional 2,500 laborers, on an average, especially at harvesttime. There have been numerous labor difficulties in the zone, sometimes resulting in strikes.

In 1931 laborers in the banana fields received from 1 to 1.50 pesos a day, which was a high wage compared with other wages in Colombia. However, late in 1932 the rates were reduced to 80 centavos a day and to 60 centavos in 1933. The cutting and loading forces usually work on a piece basis.

Health conditions are poor, and they are aggravated by the intense heat. Hygienic services in the banana zone have improved considerably in recent years, however, thanks to the effective action of the Mixed Health Center, a body created in 1936 by an agreement between the National Directorate of Hygiene, the Department of Magdalena, and a group of producers. By law of 1937 every owner who has more than five persons in his employ is obliged to furnish medical and pharmaceutical services to the workers, unless such services are furnished by the Mixed Health Center. The scientific and administrative organization of the center is very satisfactory, and its accomplishments with respect to the general health of the zone are already noticeable.

METHODS OF CULTIVATION AND HARVESTING

New banana plantations are usually established on virgin land, preferably on fine, sandy loam soil where there is a great deal of rain and a warm climate. Caterpillars and disks now replace the machete in cleaning up the dense undergrowth on the new plantations. The mulch formed by the logs, leaves, and trash from this tropical growth provides good protection for the young banana plants. The ground is pulverized by cross disking several times to prepare it for planting.

The cultivated edible varieties of bananas are perennials. They do not produce fertile seeds but are planted from the rootstock. Rhizomes from the rootstocks, or parts thereof, are planted about 11 to 18 feet apart (about 5,000 to the acre) in holes about 12 inches deep. Each piece of the rhizome must have one good eye (much like the eye of a potato), which is turned down in planting.

About 3 months after planting and every 3 or 4 months thereafter the plantation must be cleaned by having the weeds and branches cut out. Sometimes the plants that fail to come up are replaced by suckers about 6 months old, which are cut from the parent rootstock. Each rhizome sends out suckers or shoots on all sides of the plant. Only from two to five are allowed to grow, the others being pruned off. The remaining shoots develop more hands to the stem than they would if the plants were left unpruned.

Cultivation of the plantain or the banana in gardens for home consumption is very primitive. A stump is used for propagation, and it is merely stuck in the ground near the corner of the garden and allowed to grow.

The trunk of the banana plant, composed only of overlapping sheaths, is easily blown down by the wind. In some years the loss from windstorms runs very high. In 1927, 12 to 14 million stems were lost; in 1929, 10 million; and in 1931, about 13½ million. Wind of only 20 to 30 miles' velocity sometimes causes great damage, as do heavy rains.

After 10 to 11 months the blossoms begin to appear at the center of the stalk, and 3 to 4 additional months are required for the banana cluster to develop fully. The small bananas are turned downward when they first appear but turn upward as they grow.

The fruit is always cut green, even when consumed in the Tropics. The cutting gang consists of three men, the cutter, the backer, and the muleman. The cutter has a long pole with a knife at one end. He cuts the plant below the fruit and the stalk bends over. The cutter must see that the fruit is not crushed as it comes down. The backer takes the bananas on his shoulder, the bunch is cut completely from the plant, and the backer carries it off to be loaded into oxcarts. The plant is then cut down.

Most bananas are still carried from the field to the railway siding in oxcarts. Some pack mules are used. The carloads of fruit are sent to the port and the bananas transferred to the steamship, the loading continuing day and night until completed. The operations of cutting and loading are so coordinated that as many as 85,000 bunches can be cut and loaded onto the steamer in from 12 to 15 hours.

At each different point in the harvesting and loading, the fruit is inspected to make sure it is in proper condition for shipment, the fruit scheduled for European markets being less mature than that for the United States. In the ship the bunches are placed so that they rest on the large or butt end of the stalk. The ship must be of a special design to provide sufficient ventilation at controlled temperatures. Most of the ships have refrigeration machinery, which cools the fruit with fresh air circulated by fans over brine coils. The brine is cooled by carbonic-acid gas. The temperature of the storage rooms is maintained at about 57° F.

The fruit is ripened after it is received by the wholesaler in consuming centers. Temperatures must be controlled rather rigidly between 60° and 70° F., and sufficient moisture provided. In the ripening process the fruit consumes oxygen and gives off carbon dioxide. After the fruit has begun to color, ventilation is required to reduce the humidity of the room and to season the fruit properly.

FINANCING

The Magdalena Fruit Company furnished credit for the private producers during early years. In October 1932 the company announced it could not extend further loans to producers. In November 1932 the Banana Cooperative of Magdalena (Cooperativa Bananera del Magdalena) was organized to raise money for loans to the growers. Workers may also become members of the association by purchasing small shares, and they are then entitled to obtain small loans. Loans are made at 6-percent interest, and amortized by deductions of 25 percent made from the value of each shipment.

Three Government financial institutions were authorized to grant loans up to 300,000 pesos to the cooperative, and the banks were empowered to assume the growers' indebtedness to the Magdalena Fruit Company.

To increase credit to producers, the Banana Cooperative of Magdalena was granted authority to make mortgage loans, to be paid off over a period of 20 years, with interest not to exceed 8 percent annually. The Agricultural Mortgage Bank and the Central Mortgage Bank were likewise authorized to lend money to the cooperative up to the sum of 750,000 pesos for each bank, on the personal guaranty of the cooperative itself, the producers being obliged to guarantee their debts with security equal to not less than 15 percent of the value of the fruit produced by the farms given as a guaranty. The Agricultural Mortgage and Central Mortgage Banks were authorized to negotiate loans directly with banana producers, the lands concerned in such transactions to be subject to a waiver of Government rights.

The Government in 1937 was granted further power with respect to loans, as follows (9, p. 30, translated) :

The Government can, furthermore, extend credit to the fruit producers, in order that they may improve and expand production, and reduce, cancel or renew obligations affecting banana fincas or lands intended for such cultivation, or the fruit itself. If necessary, the Government can, within the limits of commercial law, substitute for either the debtors or the creditors, provided that said debtors furnish sufficient guaranties. In the liquidation of such credits, the Government or the credit bureaus which replace the debtors, will enjoy the advantages which the laws and decrees provide for the payment of debts in money or other means.

MARKETING

Almost 100 percent of the commercial banana crop is marketed through the Magdalena Fruit Company. The Company owns the railroad that goes from the coast back into the banana fields, as well as the ships that carry the fruit from Colombia to foreign markets. Bananas grown on private plantations, as well as on those of the company, are picked up at the railroad siding by the company, which takes care of them from this point on. The only expense the private grower has is the cost of cultivation, cutting, and hauling the fruit to the loading stations along the railroad right-of-way. The overhead costs of the company include transportation, loading, supervision, etc.

Private planters have been controlled pretty much by the company, since their contracts provide that all fruit they produce must be sold to the company. The bananas are inspected by company men at all points in the loading process, first at the loading points on the railroad, then at the docks, and again as they are loaded into the ships. Fruit is rejected when it is too ripe or too green or diseased, or for other reasons. Sometimes the rejections are equal to one-third of the total production.

AIDS TO THE INDUSTRY

GOVERNMENT POLICIES

Numerous laws have been enacted in an effort to protect the interests of the banana workers and the private growers. Since the Magdalena Fruit Company is the largest producer and employer of labor in the industry, the greater part of the legislation has been concerned with its activities. Companies owned by foreign capital are required to establish schools, hospitals, and health service for the workers, and a certain percentage of their employees must be native Colombians.

Laws were enacted in 1937 regulating adjudication of lands, credit to producers, hygiene, water regulation, and sale and exportation of fruit, and encouraging general improvement of the industry. The new national constitution provides for the intervention of the state in industry "for the purpose of regulating the production, distribution and consumption of resources."

To carry out the provisions of one of the laws of 1937, the Government created the National Banana Inspection, an organization that has functioned satisfactorily in the collection of the export tax on bananas, the supervision of exportable fruit in accordance with the quotas fixed by a decree of 1938, and the solution of disputes between producers and exporters regarding the quality of fruit.

Controversies arising between producers and buyers of fruit for export are settled by special arbiters and, in case of disagreement, submitted to the immediate decision of the Banana Inspection. This procedure was followed until 1938, when much wider powers of intervention were conferred upon the Government.

Further difficulties have arisen regarding the regulation of the industry, however. During 1940 the Banana Intervention Act of 1937 was declared unconstitutional by the supreme court. The orig-

inal suit was brought against the law by the private planters themselves, even though the law had been enacted for their protection.

In 1931 the Government imposed a tax of 2 centavos a bunch on the exportation of all bananas during the following 20 years. In order to discourage the further development of the banana industry in Brazil, the Government has also imposed a tax of 200 pesos on each banana shoot transported out of Santa Marta.

COOPERATIVE ASSOCIATION

The Banana Cooperative was organized in 1932, as a result of the action of the Fruit Company in discontinuing credit to private growers. The cooperative is composed of producers and workers, who may borrow from it for their operations. The cooperative may borrow money from the Agricultural Mortgage Bank and the Central Mortgage Bank on its personal guaranty.

The cooperative has been active in trying to improve the condition of private planters and has used its influence with the Government in their behalf.

TRADE

The local trade in bananas throughout tropical and subtropical Colombia is unorganized. As is customary in many South American countries, fruit and vegetables are brought into the villages and towns and sold in open-air markets along the street. Bananas and plantains for local consumption are handled in this way also, the farmer bringing in one or more stems from which the fruit is sold in the market. Bananas for export all come from the commercial producing zone of Santa Marta.

All during the twentieth century Santa Marta has exported quantities of bananas, the peak being reached in 1926, when 525 million pounds were exported. In 1931, when depression conditions existed in both England and the United States, shipments fell off to 214 million pounds. Since the entire marketing mechanism is controlled by a single organization, the supply to consuming markets could be limited readily, and the course of banana exports, therefore, did not follow that of other agricultural and raw-material products. Production in 1931, however, was curtailed by severe storms, and the drastic reduction in quantity shipped in 1931 was not due entirely to the policies of the company in restricting exports.

Export data show three principal cycles during the twentieth century. The cycles follow more or less closely the major business cycles of this period (fig. 22).

Until recently Colombian bananas have gone principally to European markets, and, together with Jamaica, Colombia has supplied the major portion of the imports into Europe. Before 1932 the United Kingdom was the most important market. In that year the United Kingdom imposed a tariff on bananas produced outside the British Empire, and Jamaican bananas replaced those from Colombia on English markets in some subsequent years. There have been radical shifts in the direction of banana exports from one year to the next, and it is difficult to distinguish any very definite trends. With the

imposition of the British tariff, the United States jumped to first place as a market for Colombian bananas and in 1940 took over half its total exports. In some years the United Kingdom has come back

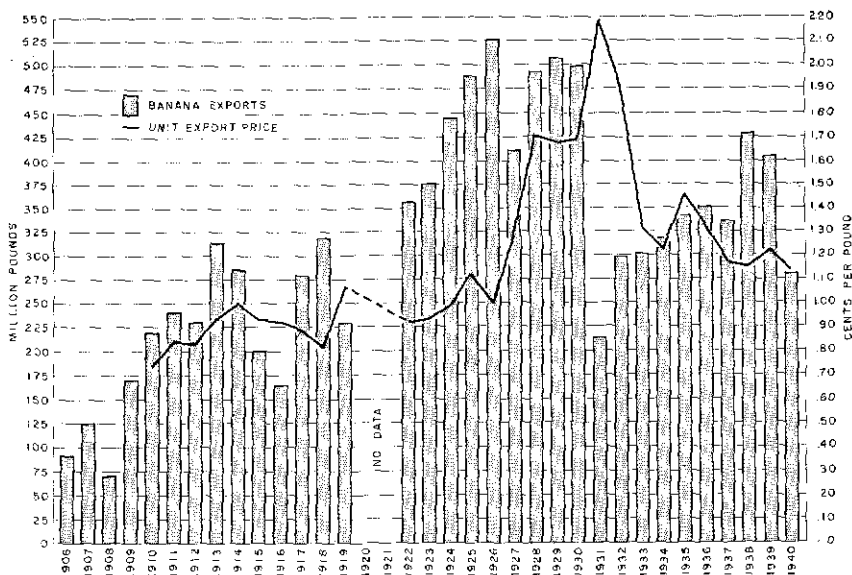


FIGURE 22.—Colombian banana exports and unit export price, 1906-40.

TABLE 22.—Percentage distribution of banana exports from Colombia, by countries of destination, 1916-40

| Year | United States | France | United Kingdom | Germany | Netherlands | Panama | Others | Total |
|------|---------------|---------|----------------|---------|-------------|---------|---------|---------|
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| 1916 | 90.9 | | 9.1 | | | | | 100 |
| 1919 | 90.5 | | 9.5 | | | | | 100 |
| 1925 | 34.2 | | 35.5 | | 29.6 | | 0.7 | 100 |
| 1926 | 26.9 | | 59.3 | | 13.8 | | | 100 |
| 1927 | 22.1 | | 76.1 | | | | 1.8 | 100 |
| 1928 | 21.0 | | 68.3 | | 10.7 | | | 100 |
| 1929 | 19.9 | | 36.9 | 4.6 | 38.3 | | .3 | 100 |
| 1930 | 12.9 | | 29.4 | 16.0 | 38.8 | | 2.9 | 100 |
| 1931 | 12.9 | 7.1 | 32.7 | 14.4 | 34.9 | 6.8 | | 100 |
| 1932 | 44.8 | 16.0 | 5.4 | 16.8 | 14.3 | 1.1 | 1.6 | 100 |
| 1933 | 35.3 | 16.6 | 23.6 | 7 | 22.1 | 1.6 | .1 | 100 |
| 1934 | 41.6 | 11.7 | 31.7 | 4.6 | 9.3 | 1.0 | .1 | 100 |
| 1935 | 54.8 | 9.6 | 12.7 | 9.7 | 12.1 | 1.0 | .1 | 100 |
| 1936 | 49.5 | | 13.6 | 21.7 | 11.1 | 4.1 | .1 | 100 |
| 1937 | 76.2 | | | 20.2 | .9 | 2.6 | .1 | 100 |
| 1938 | 53.4 | | 5.6 | 25.6 | 10.3 | 3.0 | 2.1 | 100 |
| 1939 | 32.9 | | 22.3 | 13.5 | 25.0 | 3.3 | 3.0 | 100 |
| 1940 | 53.8 | | 36.3 | | | 4.8 | 5.1 | 100 |

Pan American Union (23) and Contraloría General de la República de Colombia (6).

into the picture as a major importer, and in 1940 even under wartime restrictions on importations took 36 percent.

Before the present war, Germany and the Netherlands were large consumers of Colombian bananas, taking together almost 40 percent

of the total in some years. The war has, of course, eliminated them, and the United States and the United Kingdom are now the principal markets. This is similar to World War days, when the United States took about 90 percent of the total and the United Kingdom the remainder. Table 22 shows the percentage distribution of Colombian banana exports by countries of destination over recent years.

Practically all the United States supply of bananas is imported and comes largely from Latin America. Peak imports—more than 3 billion pounds—were in 1937. The United States usually takes from 70 to 80 percent of the world export of bananas.

Imports vary considerably from one year to the other, and decided shifts are noticeable in the sources of the fruit. Fifteen years ago Jamaica and Honduras were the largest suppliers of the United States market. Colombia furnished a little over 4 percent of the total. Recently Mexico has taken first place, and in 1940 Colombia supplied 6 percent of the total.

PRICES

Both the price received by the private grower and the declared value of banana exports are fixed by the Fruit Company. The declared value of exports varies with the conditions existing in foreign markets and the type of product shipped. Shipments of the same quality will vary in value from year to year and within the same year between different markets. One ton of bananas shipped to the United Kingdom in 1940 was valued at \$30.99 and one to the United States at \$22.50, while the same quantity sent to Panama was valued at only \$11.51.

Stems, or bunches of bananas, are valued according to the count. A first-class stem, or a full count, must have nine hands, or clusters of fruit, attached to the main stem. Seconds, containing eight hands, are counted as three-fourths of one stem, and thirds, containing seven hands, are counted as one-half of one stem. When a count stem is set at \$1, the seconds are valued at 75 cents and the thirds at 50 cents. The company set the unit value of a count at \$1 until September 1932, when it reduced the value to 75 cents per count.

The declared unit value of exports has varied widely over the years. The declared unit value reached a peak in 1931, when very few bananas were shipped. It is purely an arbitrary value and does not give any indication of the per-count value, since it averages firsts, seconds, and thirds all together.

The price received by the grower is always lower than the declared export value. For example, in September 1932, when the declared value was 75 cents per count, the grower's price was 60 cents a stem for firsts, 50 cents for seconds, and 40 cents for thirds.

FOOD CROPS

From the standpoint of domestic food supply, corn is the main article of diet and occupies more of the cultivated area than coffee. Other important food crops produced in Colombia are beans, rice, potatoes, sugar, wheat, and cacao.

CORN

Corn, the great American food product, has been growing in the Americas for centuries. It was used for food by the Indians long before the days of the conquest and is still the most important item in the diet of most Indian countries. Data as to the production and acreage of corn in Colombia during past years are very scattered. It appears, however, that during the 1920's the acreage in corn in Colombia varied quite widely, from 300,000 to 500,000 acres, and the production from 1 to 8 million bushels, with no definite trend. A tremendous increase in both the acreage and the production of corn occurred during the 1930's over those of the earlier period (table 23).

TABLE 23.—*Acreage and production of corn in Colombia, 1925-37*

| Year | Area | Production | Year | Area | Production |
|-----------|--------------------|----------------------|-----------|--------------------|----------------------|
| | <i>1,000 acres</i> | <i>1,000 bushels</i> | | <i>1,000 acres</i> | <i>1,000 bushels</i> |
| 1925..... | 367 | 4,910 | 1932..... | 1,472 | 18,715 |
| 1926..... | 385 | 5,058 | 1934..... | 1,371 | 19,684 |
| 1927..... | 494 | 7,874 | 1937..... | 1,374 | 19,310 |
| 1928..... | 282 | 1,110 | | | |

International Institute of Agriculture (18).

Corn is the major foodstuff of Colombia, consumed by the lower income classes as well as by the well-to-do. Almost every farm raises at least enough corn to supply its own requirements. The per capita consumption figure is 2.2 bushels a year. Only a small part of this is fed to livestock and consumed indirectly. The domestic production during recent years has been almost enough to satisfy domestic requirements, although in 1939 the import figure, more than 4 million bushels, was considerably higher than at any time during the previous decade.

Corn occupies more than one-third the total cultivated area and about one-third more land than coffee. In 1937-38 there were 1,374,240 acres planted to corn, as compared with 968,327 acres in coffee. The crop is second in value only to coffee, the 1937-38 value being almost one-third that of the commercial coffee crop and three times as great as that of the commercial banana crop.

DESCRIPTION OF THE INDUSTRY

Corn is produced in every Department of the country and in every municipality of every Department. It is said that wherever there is a farm there is corn in greater or lesser amount. The Departments of Antioquia, Cundinamarca, and Bolívar are the most important producers, perhaps because of the greater demand for the grain as a food for the populations concentrated there. In each of these Departments the area cultivated is 200 million acres or more. Boyacá is also an important producer, with 156 million acres. These four Departments account for 60 percent of the total acreage and 54 percent of the production (fig. 23).

Corn is usually grown either on small subsistence farms or in conjunction with some other crop of commercial importance, such as coffee or bananas. There is little information on the size of farms

producing corn or what proportion is grown on different-sized farms. There were, however, in 1937-38, 258,734 farms on which 1,374,240 acres of corn were grown, or an average of 6.6 acres per farm in corn. The largest average acreage sown in any Department was 11.1 in



FIGURE 23.—Corn acreage in Colombia, 1937-38.

Bolívar, and the smallest was 2.5 in Boyacá, both important corn producers. Antioquia and Cundinamarca averaged 9.4 and 5.2 acres, respectively (appendix table 47).

Soil and climatic conditions in the corn-growing regions follow the soil and climatic pattern of the country, since corn is produced in all Departments. The cool climate of the highland region, the

most important growing section at the present time, is not particularly favorable for the maturing of the crop, but it does prevent rapid deterioration after the corn has been harvested. In the warmer sections, where yields are higher and corn can be grown the year round, weevils also multiply profusely, and corn deteriorates rapidly.

Yellow flint corn predominates in Colombia, although the important producing Department of Bolívar raises a white corn—blanco cuba, and Boyacá raises Yucatan corn. The Departments of Tolima and Nariño produce a criollo, or native, variety.

METHODS OF PRODUCTION

Except in the Sabana de Bogotá, the methods of cultivation for corn are very primitive. Preparation of the ground for seeding includes burning the brush to clear the land and digging a hole for the seed with a sharp stick. A casual weeding with hoe or machete is performed once or twice during the growing season, and that is the extent of cultivation.

Improved cultivation methods are practiced on the Sabana de Bogotá, especially on the larger farms where it is possible to use machinery. Planting takes place from February through April and harvest from June through January, depending on the location. Down in the tropical regions of Atlántico, Bolívar, and Magdalena, planting is done in April and again in September and October, the harvests coming 3 months later—in July and December and January. Higher up the mountains in the cooler climate of Cundinamarca, the harvest is a month later. In the Santanders planting is in February and March, and the corn is not ready for harvest until August to December. Yields per acre are low throughout the producing regions, the average for the country in 1937-38 being only 14 bushels an acre as compared with 28.3 for the United States that year. The average for the Departments varies from 8.4 in Huila to 21.6 in the Intendencias and Comisariás and 20.6 in the Cauca Valley. None of these are important producers, however. Yields in the large producing Departments range from 10.6 to 15.9 bushels an acre. These yields seem very low when compared with 45 bushels an acre in the corn-producing State of Iowa.

DISPOSITION OF THE CROP

Facilities for storing corn after it is harvested are meager. It is usually kept in open cribs and deteriorates rapidly. The greatest cost of corn production in Colombia is the spoilage of the crop in storage. It is estimated that in some years the weevils alone eat at least a quarter of the crop.

All the corn is consumed within the country except a very small amount that goes to Venezuela. Corn is one of the major articles of diet, especially for the small farmers and laborers. Colombia is practically self-sufficient in corn production, very little having been imported during the past decade. During 1939, however, over 4 million bushels were imported, the greater part from the United States through Curaçao. Available data on the proportion of the total requirements imported in recent years are given in table 24.

TABLE 24.—*Production, imports, and consumption of corn in Colombia, 1932-39*

| Year | Production | Imports | Consumption | |
|-----------|----------------------|----------------------|----------------------|---------------------|
| | | | Total | Proportion imported |
| | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>1,000 bushels</i> | <i>Percent</i> |
| 1932..... | 18,715 | 39 | 18,754 | 0.2 |
| 1934..... | 19,684 | 124 | 19,808 | .6 |
| 1937..... | 19,310 | 253 | 19,563 | 1.3 |
| 1938..... | | 12 | | |
| 1939..... | | 4,114 | | |

PRICES

Few price statistics for corn are available, especially for earlier years. The average value of the crop was a little over 80 cents a bushel in 1937-38. Value varied widely by Departments, however, ranging from 36 cents in Atlántico to \$1.15 in Antioquia. Retail prices are high, and vary from one locality to another. During recent years they have averaged about a dollar a bushel in Bogotá and 75 cents in Barranquilla. Because of the lack of adequate storage facilities, supplies run very low between harvests, and there is consequently a wide variation in price during the crop year, prices sometimes going over \$2 a bushel just before harvest.

GOVERNMENT POLICIES

The Government is interested in expanding corn production above domestic requirements. Except for the high import duty on corn, very little has been done to encourage corn production in past years. The tariff of 10 centavos per kilogram, about \$1.55 a bushel, has tended to increase the acreage planted to corn but has at the same time made it more difficult for the low-income groups to obtain corn.

Corn was included in the agricultural price-regulation program, which was initiated in 1931, whereby food-control boards in the Department capitals could regulate the prices of foodstuffs. It was also included in the agricultural-expansion program adopted in 1938, and plans were made to set up a commission for corn, headed by an agricultural expert with four helpers. Technical experiments are to be made on corn in the large producing areas similar to those being conducted for wheat. The Government hopes to develop better varieties of seeds, improve methods of cultivation, and devise more adequate systems of storing and conserving the harvested grain.

Corn will no doubt continue to be the most important food item in the diet of Colombians. With the increased interest of the Government in developing improved varieties and production practices, domestic production is likely to keep pace with the food needs of the country. Though the Government from time to time has expressed an interest in expanding corn production to a point where corn can enter the export market, this development, if it does come, seems very far in the future. It is unlikely that the inefficient and high-cost production and the transportation problems can be solved to an extent that will allow Colombia soon to compete with Argentina in supplying corn for export.

BEANS (11)

Beans are the basic food of about 2½ million people in the Departments of Antioquia, Caldas, northern Tolima, and part of Valle. The value of the bean crop in 1937-38 was almost as great as that of cacao and almost twice that of cotton. This crop occupies about one-fourth as much cultivated land as coffee and in the Departments of Antioquia and Caldas is the fourth crop in importance.

All the beans produced in Colombia are used for domestic food. There is some importation, about 1 percent of total requirements, but Colombia is practically self-sufficient as regards this food. A little over a million pounds were imported in 1939, largely from the United States and Chile.

DESCRIPTION OF THE INDUSTRY

Beans are grown in all Departments of Colombia, but Antioquia is the most important producer. In 1937-38 that Department produced 37.5 percent of the crop and cultivated about 40 percent of the total acreage in beans. Other important producing Departments are Caldas and Valle. Figure 24 shows the acreage in beans by Departments (also appendix table 48).

Beans were grown on 179,139 acres on 98,474 different farms in 1937-38. The average area cultivated was small, only 1.8 acres for the country as a whole. The average was somewhat higher in the important producing Departments, in Antioquia being 3.7 acres. The average yield for the country is low, about 444 pounds per acre. In Valle, however, yields are much higher, reaching 643 pounds.

Beans require a moderate climate with well-distributed rainfall but will thrive in soils of medium consistency and fertility. For bean production it is especially important that the soil contain sufficient potash, phosphorous, and nitrogen. The Government is trying to educate the farmer to analyze his soil and apply the needed fertilizers.

Two varieties of beans are grown in Colombia, the common bean (*Phaseolus vulgaris* L.) and a Spanish bean (*Phaseolus multiflorus* Willd.) The first variety, both dwarf and climbing, is more generally grown.

METHODS OF PRODUCTION

The time of planting and harvesting varies with the altitude at which the beans are grown. In Antioquia planting is usually done in August and September and in Caldas in January and February. The harvests are usually about 6 months later. In the Cauca Valley, however, it is possible to grow two crops every year. Planting takes place in March and September and harvesting in June and November.

The dwarf bean is usually preferred for intensive cultivation, and the climbing varieties are grown in the fields with corn. The dwarf beans are planted in furrows about 2 inches deep, 14 to 16 inches apart. Three or four seeds are planted together, about 8 to 13 pounds of seed being required per acre, depending on the size of the beans. Weeds develop rapidly, and it is necessary to clean the fields two or three times before harvest.

A few beans are harvested green for use as string beans, but most of the crop is allowed to dry in the fields until the pods are yellow. The

plants are cut down, tied into bundles, and dried. The beans are usually threshed by beating with a hand spindle (mazorcador). The straw is used for forage.

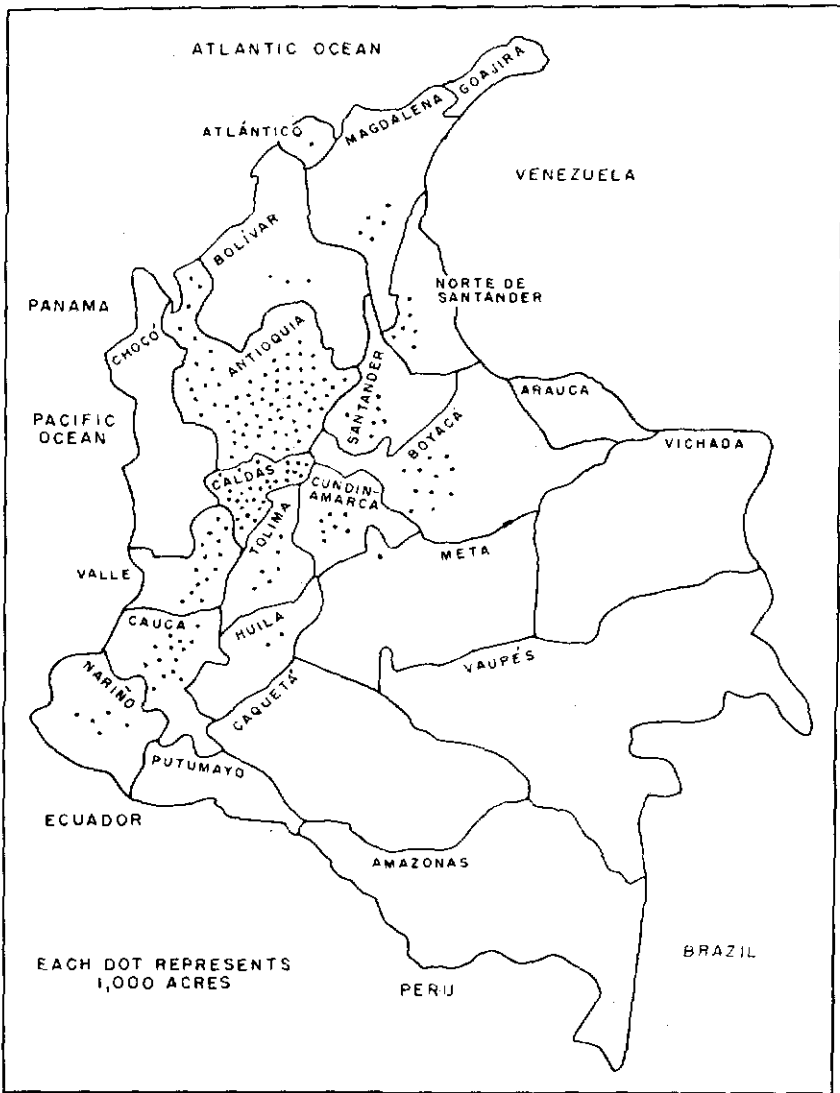


FIGURE 24.—Bean acreage in Colombia, 1937-38.

RICE

Rice is one of the major food crops of the country and must be imported in large quantities to meet domestic requirements. Rice production has increased tremendously in recent years. In 1929-30, 882,000 bushels were produced; in 1932, 4,134,000 bushels; and in 1936, 8,462,000 bushels. In 1937-38 production dropped to less than 6 mil-

lion bushels, with a value of 9.3 million pesos (5.2 million dollars). Acreage more than doubled from 1929 to 1933, being 114,000 acres in the latter year. By 1937-38 it had grown to 165,977 acres, or 4 percent of the area cultivated in major crops. Colombia has imported from 18 to 32 million pounds of hulled rice in recent years, imports ranging from 10 to 22 percent of total requirements.

DESCRIPTION OF THE INDUSTRY

The two major rice-producing regions are in Bolívar and Valle, these two Departments accounting in 1937-38 for about 66 percent of the total production and having within their borders 41 percent of the total acreage. Rice is also being cultivated successfully in Venadillo and Armero in the Department of Tolima and in some parts of the Department of Huila (appendix table 49 and fig. 25).

There were 11,635 rice-growing farms in 1937-38, the latest year for which detailed data are available. The average size of these farms was 198 acres. Only a small proportion of this acreage was in rice, however, the average area in rice being only 14.3 acres. Seventy-seven percent of these farms cultivate areas of less than 12 acres each, and 89 percent 25 acres or less. The 77 percent of the farms with less than 12 acres in rice, however, accounted for only 24 percent of the total acreage planted and only 21 percent of the total production. On the other hand, two-tenths of 1 percent of the farms (with over 450 acres of rice) accounted for 12 percent of the riceland and 14 percent of the production (table 25).

TABLE 25.—Area and production of rice in Colombia on farms of different sizes as percentage of total, 1937-38

| Acres | Farms cultivating rice | Area in rice | Production of hulled rice |
|--------------|------------------------|--------------|---------------------------|
| | Percent | Percent | Percent |
| Less than 12 | 77.32 | 24.18 | 21.06 |
| 12-25 | 11.9 | 15.06 | 14.42 |
| 25-50 | 6.0 | 14.60 | 13.32 |
| 50-125 | 3.41 | 17.31 | 17.0 |
| 125-250 | .83 | 9.19 | 9.92 |
| 250-370 | .2 | 3.93 | 4.59 |
| 370-500 | .13 | 3.67 | 5.89 |
| Over 500 | .21 | 12.06 | 13.60 |
| Total | 100.00 | 100.00 | 100.00 |

Several native varieties of rice are cultivated in Colombia (fig. 26). In Bolívar, the Criollo Forastero is the principal variety; and in Valle, Guayaquil rice predominates. Perhaps the greatest difficulty faced by the industry is the presence of diseases and pests. It is estimated that in the Cauca Valley diseases have reduced yields 75 percent. Very little is known about the control of these diseases, and consequently they are spreading rapidly.

Sharecroppers and tenants cultivate the rice in the Cauca Valley, where rice is grown on larger plantations. The land is cultivated largely by owners in other sections, including Bolívar, the most important producer, where the average areas in rice are small. On the 11,635 farms where rice was cultivated in 1937-38, there were 21,518 sharecroppers and laborers who cultivated almost half the

total area in rice (47 percent). In the zone containing the Departments of Antioquia, Atlántico, Bolívar, Magdalena, Santander, and Norte de Santander, owners or proprietors cultivated only 38 percent of the total area in rice, whereas in the other zones they cultivated from 70 to 80 percent.

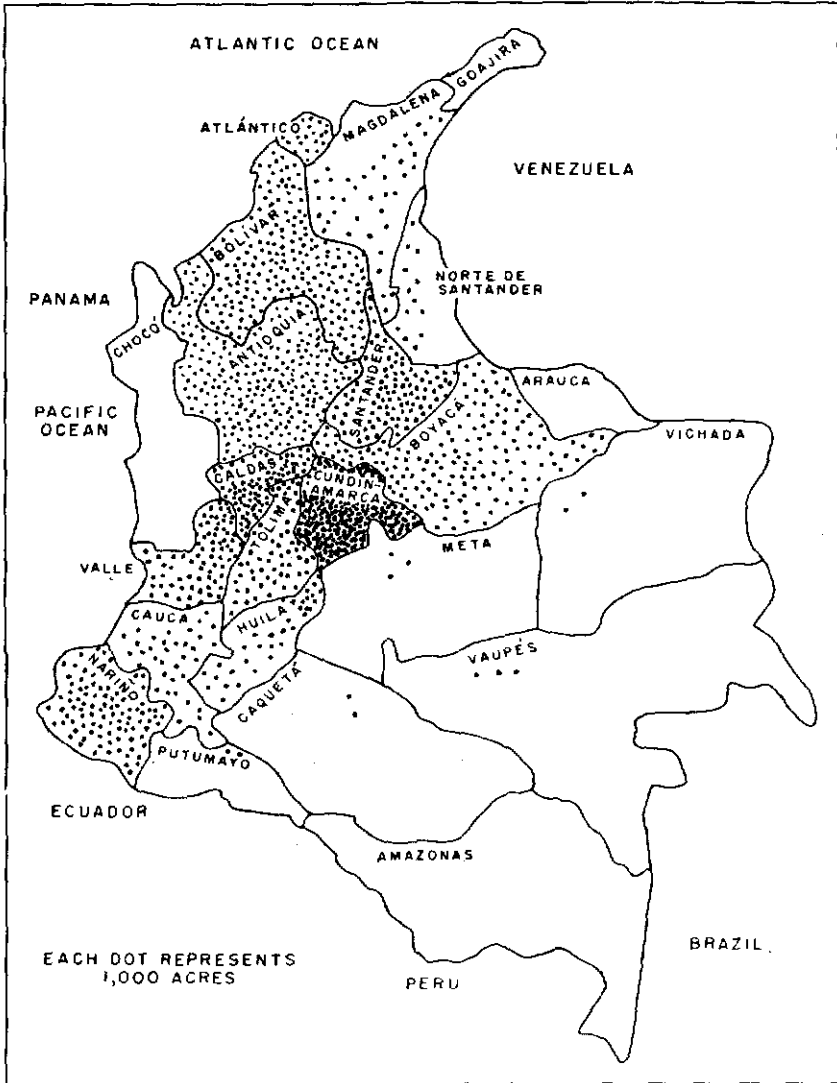


FIGURE 25.—Rice acreage in Colombia, 1937-38.

METHODS OF PRODUCTION (12)

The time of seeding and of harvesting for rice varies with the location of the fields. In the Bolívar zone the seeding usually is done in April and August, and harvesting in September and De-

ember. In Valle seeding is done largely in March and April, and harvesting is carried on the year round.

Rice cultivation in Bolívar is rudimentary. Only three or four planters are equipped with machinery. The land is cleared and burned and then seeded. Irrigation is not practiced. Harvesting is done by hand and the grain cut with small knives. The grain is threshed by beating or pounding the piles of rice and is placed by hand in stone mortars for hulling. A few small hulling machines are in use. Rice is grown in this Department primarily for local use. The industry is second in importance to cattle raising.

Cultivation in the Cauca zone is more efficient. The land is well prepared and irrigated, and agricultural machinery is used. The principal problem in this region is the presence of diseases caused by



FIGURE 26.—A rice field between Mariquita and Honda.

Helminthosporium sp. and *Piricularia oryzae* Br. et Cav., more prevalent here than elsewhere because of the ratoon system.

Average yields per acre run about 36 bushels of rough rice, as compared with an average of 50 bushels in the United States. The highest yields are obtained in Cauca—68 bushels as compared with 75 bushels in California. Yields increase slightly with an increase in the size of the farm up to 500 acres but fall for those having more than 500 acres. Farms between 300 and 500 acres obtain the highest yields.

AIDS TO THE INDUSTRY

The Government is taking steps to promote the production of rice. The experiment station at Palmira is being urged to devote part of its efforts to developing disease-resistant seed suitable for particular areas. There is at present a rice commission under an agronomist, with helpers located at Magangué and El Sinú in Bolívar, at Neiva in the Department of Huila, at Bugalagrande in Valle, and one in the Meta Intendencia.

The rice commission in Bolívar proposes to teach the farmers modern methods that can be adapted to the needs of the small cul-

tivator. The principal aim of the commission in the Cauca Valley for the moment is obtaining better seed through mechanical selection and securing varieties that are resistant to diseases. Attempts are being made to prove practically to the farmers that the abuse of the ratoon system (cuttings sometimes run up to 14 for a single planting) gives only illusory benefits and in the long run harms the farmer considerably, both on account of the spread of diseases and because of lowering the fertility of the land.

In order to encourage the production of rice at home, the Government has instructed the export-control office to restrict the importation of rice. After July 1940 imports of rice were to be limited according to the following schedule: From July 1 to December 31, 1940, 11 million pounds; during 1941 and 1942, 17.6 million pounds; and during 1943, 8.8 million pounds. After 1943 no import licenses are to be issued for rice. These amounts may be exceeded only in case of a crop failure within the country.

The Central Rice Association (the Arrocera Central) was established at Medellín in November 1932 to promote rice cultivation in the Department of Antioquia. The association has installed several rice mills, extends loans to producers, and instructs growers in improved methods of cultivation.

CONSUMPTION AND TRADE

All of the rice produced in Colombia is used locally for food. Even with a high import tax on rice and high freight charges on the internal movement of foreign rice, however, it has been necessary to import about 14 percent of domestic requirements. Rice consumption is heaviest along the Atlantic coast and in the Magdalena Valley. The people living at the higher elevations prefer wheat and corn. With the development of extensive plantings and the use of agricultural machinery, the production of rice is increasing. It is now estimated that with present yields it would require only about 10,000 additional acres of land in rice to produce the equivalent of importations. Land of better than average fertility with adequate water easily accessible for irrigation is available for rice cultivation in some of the interior valleys and in the plains south of Barranquilla and Cartagena.

TABLE 26.—*Production, imports, and consumption of rice in Colombia, 1934-35 to 1939-40*

| Year | Production | Imports | Consumption | |
|---------|---------------------|---------------------|---------------------|---------------------|
| | | | Total | Proportion imported |
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>Percent</i> |
| 1934-35 | 114, 838 | 32, 280 | 147, 096 | 21. 9 |
| 1935-36 | 120, 928 | 20, 986 | 141, 914 | 14. 8 |
| 1936-37 | 235, 058 | 26, 585 | 261, 643 | 10. 2 |
| 1937-38 | 164, 563 | 25, 635 | 190, 198 | 13. 5 |
| 1938-39 | | 26, 043 | | |
| 1939-40 | | 48, 982 | | |

Contraloría General de la República de Colombia (7).

Barranquilla is the center of the rice trade in the country. During the decade of the 1920's more was spent for imported rice than for any other foreign product. About 90 percent of the rice going to Colombia during this period was oriental rice of low quality, but it entered by way of European mills and brokers, largely German.

The quantity of rice imported has varied widely (table 26), ranging from 127 million pounds in 1930-31 to 21 million pounds in 1935-36. During the 1930's the average quantity imported declined sharply to 30 million pounds from a 97-million average for the 1926-30 period. The quantity imported in 1939-40, however, was almost 49 million pounds, an increase of 88 percent over that of the preceding year. During the latter part of this past decade, Ecuador has been the chief source of imports, the United States having a very small share of the market.

With the establishment of import licenses in 1940 the quantity of imports was restricted, and Colombia expects to be on a self-sufficient basis by 1943.

POTATOES (12)

The potato is a native of the Andean Cordilleras. The Spanish conquistadors found the Indians growing potatoes on the high mountains of Colombia and Peru, and potatoes have always been a staple food of these highland peoples. From colonial days, however, the small, diseased, or weak tubers have been used for seed, with consequent deterioration in the quality and quantity of production.

The value of the potato crop is about two-thirds that of corn, although this high value is due to the high unit cost of the product. The potato acreage is greater than that of cotton, rice, cacao, or tobacco, and 15 percent that of coffee. Potatoes are used extensively in the diet of the highlands but not of the coast country.

DESCRIPTION OF THE INDUSTRY

The large producing regions are in the highlands, particularly the Eastern Cordillera. The three Departments of Boyacá, Cundinamarca, and Nariño are the important producers, each of them growing over 2.5 million bushels in 1937-38 (fig. 27 and appendix table 50).

There were 77,051 farms producing potatoes in 1937-38 on a total of 166,906 acres, or an average of only 2.2 acres per farm. The average area in potatoes in the important producing Departments varied from 1 acre in Boyacá to 3.9 acres in Nariño.

The quality of the potatoes grown in Colombia is uniformly poor. The plants have become more and more susceptible to frosts, diseases, and excess rain and drought. The varieties predominating are the Tuquerrena in Boyacá, the Tocana in Cundinamarca, and the Pauba in Nariño.

From colonial times to the present day, cultivation of the potato has been characterized by careless practices. The weak and diseased potatoes have been used for seed, with consequent decline in yield and production. The average yield per acre in 1937-38 was only 63 bushels, as compared with 119 bushels in the United States and

over 350 in some of the producing countries of Europe. The soil has been cultivated inefficiently year in and year out without fertilization to replace any of the elements withdrawn by constant use. As a result of these careless practices by generations of farmers, the cost



FIGURE 27.—Potato acreage in Colombia, 1937-38.

of production per unit has risen tremendously until it is now three times the cost in the United States and nine times the cost in the neighboring country of Ecuador.

All of the potatoes produced in Colombia are consumed within the country, largely in the Departments producing them. An insignificant quantity is imported in some years for use in the coastal

cities. This amount, which does not usually exceed 25,000 bushels, comes largely from the United States. The import tariff is about 1.5 cents a pound, although under the United States-Colombian trade agreement the rate to the United States is 1.29 cents a pound, or 77 cents a bushel.

GOVERNMENT POLICIES

The Government has recently established a potato commission to encourage the development of the potato industry. Its main functions and objectives will be:

- (1) A campaign against diseases and plagues;
- (2) Lowered prices for fertilizers, insecticides, and fungicides;
- (3) Study of a rotation of suitable crops;
- (4) Selection and improvement of indigenous varieties;
- (5) Importation and study of foreign varieties;
- (6) Crossing and hybridizations tending to produce varieties more resistant to weather and diseases and more productive.

To carry on its activities, this commission will have a central experimental potato station in Cundinamarca and some testing fields in other producing Departments. The work will be entrusted to an engineer-agronomist, who will direct the campaign, and four assistant agronomists.

SUGAR

The cultivation of sugarcane in Colombia dates back to colonial days. In the latter part of the nineteenth century, sugarcane was on an export basis, 246 short tons being exported in 1879-80. As domestic demand increased, however, the country was transformed from an exporting to an importing country. During the 1930's, the quantity imported varied from 172 to 23,534 tons, furnishing from less than 1 percent of domestic requirements of raw sugar to 56 percent. Production of sugar increased from 11,000 tons in the 6 domestic mills in 1930 to 53,000 tons in 13 mills in 1939 (7).

The above figures cover plantation sugar only. However, in Colombia the production of panela, a brown sugar usually sold in cake form, miel or molasses, and pan, a yellowish-white loaf sugar, is more important in meeting domestic needs than is refined sugar. The 1939 production of sugar ran to 53,000 tons, whereas the production of panela was 380,000 and that of miel 770,000 tons.

Panela, miel, and pan are produced throughout the country and provide a basic article of diet for the lower income groups. It is estimated that the area planted to sugarcane is half as large as that planted to corn. There are no data on the total value of the crop, but the value of the product of the sugar mills producing refined sugar only was 5.4 million dollars in 1937-38, greater than the value of the commercial banana crop. The national sugar industry is said to represent an investment of some 14 million dollars and to support approximately 30,000 persons.

DESCRIPTION OF THE INDUSTRY

Panela and miel are produced in all the Departments of Colombia, with Atlántico, Valle, and Cundinamarca having the largest production in 1937-38. Cundinamarca ranked first in acreage, with 175,000

acres under cultivation, although the great sugar-producing area is in the Cauca Valley, where natural conditions for cane growing are said to be the best in the world. Refined sugar was produced in only six Departments, and the two Departments of Valle and Bolívar

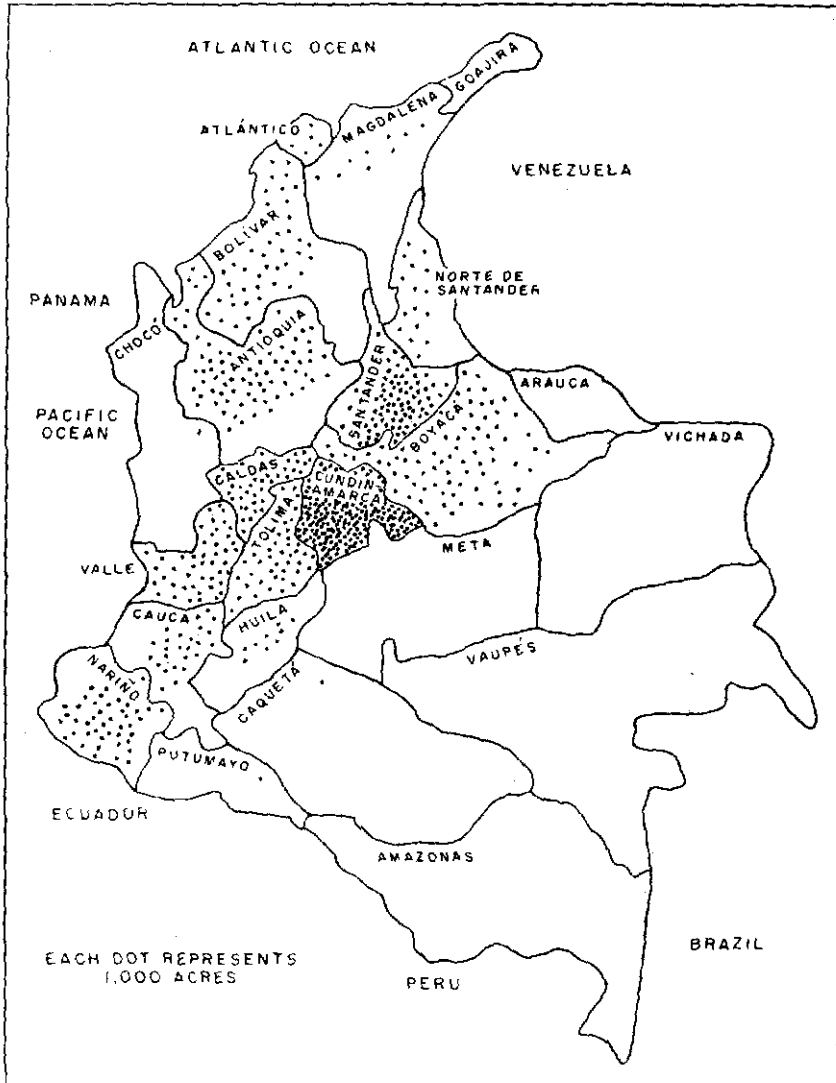


FIGURE 28.—Sugar acreage in Colombia, 1937-38.

accounted for 85 percent of this total. Total production of "sweets," including panela and miel, runs 183 million pounds for Valle and for Antioquia, 159 million for Cundinamarca, and 104 million for Santander (fig. 28 and appendix table 51).

The area producing raw sugar in 1939 is divided into three zones, the most important being the first, which includes Cauca and Valle.

Seven of the thirteen mills in the country are located in this zone: Manuelita, Providencia, Ríopaila, La Industria, Perodías, Mayagüez, and Bangala. The second zone, on the Atlantic coast, contains the Sincerín and Berástegui mills in the Department of Bolívar, and Sautatá in the Chocó. The third zone, in the interior, contains San Antonio and Payandé in Cundinamarca and Carrillo in Santander del Norte. Santander del Norte is sometimes considered a fourth zone. Sugar production is of commercial importance in the Cauca Valley and at the lower elevations on the Central Cordillera.

The cultivation of sugarcane is carried on by many small farmers and a few large mills. Between 90 and 100 percent of the raw sugar is produced by large-scale enterprises, although *panela*, *miel*, and *pan* are produced in small mills from small acreages of cane.

There were 65,665 farms producing 674,135 acres of sugarcane in 1937-38, including the 13 large sugar mills that produce refined sugar. These large mills owned 32,000 acres of sugar land, of which 62 percent was actually in cane. The average size of the cultivated plantations varied from 500 acres in the third zone to 1,400 acres in the first zone and 2,700 acres in the second zone. This is in sharp contrast to the average of 10.3 acres in cane for the country as a whole, including the small farms producing *panela* and *miel*. Average cane acreage ranged from 3.3 acres in the Department of Huila to 23 in Chocó (appendix table 51).

The most favorable altitude for cane growing in Colombia is about 3,000 feet above sea level, and it can be grown up to 5,000 feet. The ideal soil is that which contains 50 percent clay, 16 percent sand, 8 percent lime, and 26 percent organic matter and water.

The soils in Valle and in parts of the Atlantic coast region offer excellent growing conditions for cane. They have been formed by deposits from the rivers and are continually enriched by additional sediment. The level plains permit the use of machinery in cultivation of the cane, make irrigation easy, and enable transportation facilities to be developed at much less cost than in the rougher levels of the third zone. The soils there are subject to continuous erosion by the heavy rains that deprive the soil of elements essential for the proper development of the cane.

The first sugar zone is the most important producing region. Cane can be grown all the year round, and processing can be continuous. Production is limited to 4 or 5 months during the year in the second zone. The third zone is quite different from the other two. The rough topography prevents the use of much machinery in cultivation, and production is therefore limited to small enterprises.

High temperatures and well-distributed rainfall are required for cane growing, and low temperatures and comparatively dry weather for processing. In the first and third zones moisture is fairly well distributed, the rain coming at fairly definite times. January, February, and part of March are dry; July, August, and part of September are dry. In the second zone, there are four dry months, January, February, March, and April. The rains begin in May or June and are very intense. They continue for the rest of the year. The excess rain is bad for the cane and also limits the processing of sugar.

The native, or criolla, varieties, both white and crystalline, are grown in about 90 percent of the area of the second zone. Sugar has been grown in Colombia since colonial days, and has been degenerating slowly but steadily. It is a bland variety, sweet, but with little vigor, a low yield, and great susceptibility to the mosaic disease. It is being replaced by foreign varieties that are better yielding and more resistant to diseases. The large producers have been shifting over to the newer varieties, adding to the wide gap that already existed between the large and small producers. In the first zone there is now very little criolla grown. This zone is close to the station at Palmira and benefits most from the experimentation performed there.

Some of the large mills employ laborers to work in the canefields at a minimum wage of 1 peso a day. Harvesting and hauling is usually done by contract for a certain amount per ton.

In many of the mills producing raw sugar there are not enough trained factory workers, and many practices are not as efficient as they might be. The sugar content of the cane juice now produced could be increased if greater care were taken in the technical operations.

The use of agricultural machinery is general in Valle and the coast regions. It ranges from the 12-inch plow and small tractor to the large machine called a girotyller, which performs all the operations in preparing the soil at one time. In the first zone, the wheel tractor is much in use, whereas in the second zone the caterpillar type is used because of the rougher terrain. Some plantations use tractors, but the smaller operators still use mules to pull the plows.

METHODS OF PRODUCTION

There are two more or less definite systems of cultivation of cane: one is highly scientific, making use of machinery and advanced technical knowledge, and the other follows no definite system and has no basis of rational technique. Between these two extremes there is a middle course followed by some. In the second zone, the soil is prepared with machinery, plowed, and seeded, but aside from that the machete is used in cultivation, the weeds being cut with it level with the ground. It is difficult to change these practices because the worker resists changing the machete for a plow.

Modern systems of cultivation have been introduced in the first zone; the soil is carefully prepared, selected seed is used, and irrigation is practiced. La Manuelita and Ríopaila especially give careful attention to the scientific preparation of the soil. There is no stubble or woodland, so that cultivation is relatively easy with a tractor-drawn plow of from three to five disks. Seed cane is used in planting, and two sections, each containing three shoots or eyes, are planted in each place. No systematic method is followed in determining the distance between plantings. After the soil is prepared, the plantations are seeded. One seeding of the new varieties of cane will produce for 4 or 5 years, and then in order to obtain optimum yields it is necessary to clean the field, prepare the soil for new seed, and replant.

Most of the plantations do not irrigate their fields, although some ingenios, or mills, in the first zone and at San Antonio irrigate their cane. In Valle, irrigation canals are dug across the fields, and the water from the mountain streams is used to flood the cane in the dry season. Drainage is as important to the growth and yield of the plants as sufficient water, for water standing on the fields injures the plant.

Colombia is almost the only sugar-growing country in the world that does not have a systematic technique for fertilizing the soil. Fertilizer, such as manure and lime, which many mills throw away, could easily be used.

The cane is cut according to the age of the plant, the first cutting at the end of 16, 18, or 20 months, and subsequent cuttings (re-toños) at 12- or 14-month intervals. The cane is cut level with the ground with a machete from 18 to 22 inches long, the shoots (cogollo) are cut off, and the cane is divided into two parts for easy transportation. The cane is piled into small lots as the cutting proceeds, according to a certain standard or measure.

AIDS TO THE INDUSTRY

The Government has taken official action to aid the sugar industry along the following lines:

- (1) Maintenance of high duties on imported sugar;
- (2) Lowering of freight rates on sugar;
- (3) Provision of credit at difficult periods;
- (4) Government importation of sugar to meet domestic demand;
- (5) Prohibition of the use of molasses for the manufacture of alcohol.

In line with its policy of promoting self-sufficiency, the Government has maintained a high duty on imports for many years. The present tariff is more than 5 cents a pound.

The new P. O. J. varieties, particularly P. O. J. 28-78, are high yielding, sometimes producing three to four times as much as the criolla. The average yield for the whole country is 57 tons an acre, but in Bengala the yield reaches 150 tons. Even after seven cuttings from the P. O. J. varieties the yield exceeds the best crop of criolla.

The change to the newer varieties has brought with it many complications in the processing industry because the newer varieties are very difficult to process in the machines that have been used in the regions. This is particularly serious since most of the panela and miel is produced by small mills with a low capacity. The experiment station at Palmira is planning to investigate the possibilities of providing machines suitable for processing the new varieties of cane.

A serious threat to the production of cane is now the mosaic disease, which first appeared in Colombia in 1932. In some regions there has been an appreciable reduction in the productivity of plantations due to this disease, yields sometimes being decreased 50 per cent. In combating the disease, the substitution of varieties immune to it has been most effective. The large private growers have been active in this work as well as the farm department of Palmira and the National Agricultural Institute, at Medellín.

The common sugarcane borer of the West Indies, *Diatraea saccharalis* (F.), is particularly destructive in the fields in the coast regions, where it lowers the sucrose content of the cane juice. Apparently this pest has no natural enemies in Colombia, although parasites of the borer are used effectively in Puerto Rico.

Since 1932 the Government has taken a more active interest in the development of the sugar industry than formerly. In that year sugar prices reached a very low level, and the sugar mills were placed in a difficult position. Government action helped to establish the Sociedad Seccional de Crédito Azucarero. As a result, the industry was able to improve its condition. The scarcity of sugar in the country in the following years and the danger of a consequent rise in price led Congress to empower the Government to import sugar to meet domestic requirements. The imported sugar was distributed through this organization. The society was liquidated the following year, and a disorganization in the sugar market resulted. The Government thought it necessary to maintain the price of sugar and supervised the grouping of the sugar producers into a single distributing agency, or trust, which has held prices at a level very remunerative for the large sugar producers (9 pp. 25-28).

Since there are numerous small producers of panela and miel whose products do not benefit from this association and since sugar is one of the necessities of Colombian consumers, the Government has organized a technical commission, or campaña, which is to attempt to lower the price to the consumer and at the same time assure the producers a fair income.

The campaña is composed of an agricultural engineer and seven helpers located in the producing zones at Medellín, Antioquia; Chiquinquirá, Boyacá; Sincerín, Bolívar; Pereira, Caldas; Bucaramanga, Santander; Cúcuta, Norte de Santander; and La Mesa, Cundinamarca.

In addition to the small national trust of large producers established to control the distribution of sugar, there are three cooperatives that promote cooperation among all producers. They are located in Cundinamarca, Atlántico, and Valle.

In May 1933 a Sugar Credit Association was established to provide more adequate credit for the growers.

CONSUMPTION AND TRADE

All sugar produced in Colombia is consumed within the country. Of greater importance for local use than raw sugar is panela, a brown sugar which is not centrifuged and which is usually sold in solid cakes. Miel, or molasses, and pan are produced in large quantities also, and cane juice is used extensively in the production of aguardiente, an alcoholic beverage that is very popular. The use of white sugar is increasing, however, the per capita consumption having risen from 1.2 pounds in 1930 to 2.6 pounds in 1939.

Centrifugal sugar produced in the Cauca Valley finds a market in the cities, but the cost of transportation is extremely high, representing about one-third of the retail price. To reach the capital, sugar must be taken by railroad up the western slope of the Central Cordillera and carried over the summit by motortruck into the

Tolima Valley, where a second railway carries it to the western slopes of the Eastern Cordillera to Bogotá.

Very little exportation has taken place recently, but in most years there have been imports of varying quantities. The Government has strict control of imports and decides when it is necessary to import sugar for domestic needs or to hold down the price. They hope to become self-sufficient in a few more years. They had not expected to have to import during 1941, but bad weather cut domestic production, and it is estimated that imports of 150,000 to 200,000 bags will be needed.

Table 27 indicates the wide variation in the imports of refined sugar over the past decade.

TABLE 27.—*Production, imports, and consumption of sugar in Colombia, 1932-40*

| Year | Production | Imports | Consumption | | Year | Production | Imports | Consumption | |
|-----------|-------------------|-------------------|-------------------|-----------------------|-----------|-------------------|-------------------|-------------------|-----------------------|
| | | | Total | Pro-portion im-ported | | | | Total | Pro-portion im-ported |
| | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Percent</i> | | <i>Short tons</i> | <i>Short tons</i> | <i>Short tons</i> | <i>Percent</i> |
| 1932..... | 44,064 | 198 | 44,262 | 0.4 | 1937..... | 47,870 | 20,693 | 68,563 | 30.2 |
| 1933..... | 42,084 | 172 | 42,256 | .4 | 1938..... | 51,538 | 2,700 | 54,238 | 5.0 |
| 1934..... | 40,134 | 257 | 40,391 | .6 | 1939..... | 51,743 | 6,099 | 57,842 | 10.5 |
| 1935..... | 36,894 | 9,010 | 45,904 | 19.6 | 1940..... | 52,900 | 16,491 | 69,391 | 23.8 |
| 1936..... | 34,373 | 23,534 | 57,907 | 40.6 | | | | | |

¹ Approximation. Anuario General de Estadística (7) and Anuario de Comercio Exterior (6).

In 1939 Cuba was the chief source of supply for Colombian imports of sugar, furnishing 58 percent of the total. Peru supplied 28.5 percent and the United States 11.1. However, in 1940 Peru furnished 40.8 percent and the United States 58.2.

The price of sugar is now controlled by the Government through its control of imports. The retail price in June 1941 was 11 centavos (about 6.3 cents) a pound. Panela is sold by unit, not by weight. The units weigh anywhere from 1 to 1¼ pounds and are of varying quality. The price is considerably lower than that of white sugar.

FUTURE POSSIBILITIES

Several regions offer favorable conditions for expanding sugar production beyond the present scale, especially in the Cauca Valley. The output of *ground sugar from the cane* now grown could be increased materially through the use of more efficient methods in the factories and through improvement in the purity of the juice itself. The high tariff on sugar has tended to perpetuate inefficiencies. The increase in production needed to attain self-sufficiency is not great and could be brought about by private capital.

WHEAT ¹²

There has been a tremendous increase in the production of wheat over the past decade. From 1.5 million bushels in 1928 production

¹² See also ROALS, GORDON P. WHEAT IN COLOMBIA. Foreign Crops and Markets 27: 219-223, illus. 1933. [Mineographed.]

increased to 4.5 million bushels in 1936-37, although there was a sharp drop in 1937-38. The increase over this period has been the result of increased acreage planted rather than of an improvement in the yield of grain, as is shown in the following tabulation on wheat acreage and production (7, 18):

| | <i>Acres</i> | <i>1,000 bushels</i> |
|-----------|--------------|----------------------|
| 1928..... | 148, 260 | 1, 503 |
| 1930..... | ----- | 1, 967 |
| 1931..... | 271, 810 | 2, 824 |
| 1932..... | 269, 339 | 2, 478 |
| 1933..... | 269, 339 | 2, 821 |
| 1934..... | 365, 708 | 3, 634 |
| 1935..... | 370, 650 | 3, 756 |
| 1936..... | 509, 026 | 4, 532 |
| 1937..... | 493, 304 | 3, 355 |

Wheat is one of the major foodstuffs of Colombia, although the per capita consumption is low, less than half a bushel, as compared with 4.7 bushels in the United States. Consumption of wheat and wheat flour is concentrated in the cities in the producing areas on the plateaus and in the coastal regions where imports are available. Many Colombians do not eat wheat bread at all. The per capita consumption of those who do eat wheat is therefore much higher than the average indicates. The total annual consumption runs over 4 million bushels. Colombia imports wheat flour in varying amounts, ranging from 440,000 pounds in 1938 to 3.5 million pounds in 1939. Domestic production of wheat increased substantially during the 1930's under the stimulation of Government encouragement, but increased consumption has kept pace with production.

The 493,304 acres devoted to wheat in 1937-38 represented over 10 percent of the total cultivated acreage and was more than half of that in coffee trees and more than a third of that planted to corn.

DESCRIPTION OF THE INDUSTRY

Figure 29 shows that the wheat-producing regions of Colombia are on the slopes of the Eastern Cordillera. (See also appendix table 52.) The two Departments most important in the production of wheat are Cundinamarca and Boyacá, which alone account for over 80 percent of the total production and acreage.

The latest year for which complete statistics are available is 1937-38, at which time there were 55,666 farms producing wheat in 10 different Departments. Boyacá cultivated wheat on 30,741 and Cundinamarca on 12,095 farms. The average size of farms on which wheat was grown was only 35.8 acres, and the average area planted to wheat only 8.9 acres. The average size of farms producing wheat in Boyacá was below the average for the country, or 23.5 acres, with 7.1 acres planted to wheat, and that for Cundinamarca was much above, or 45.2 acres, with 15.1 acres planted to wheat. Almost 87 percent of the fincas producing wheat cultivated less than 10 acres, and there were only 32 fincas in the country cultivating more than 450 acres. More than 36 percent of all the wheat produced was grown on small farms cultivating less than 10 acres of wheat and almost 90 percent on farms cultivating less than 250 acres.

The wheat-producing sections are principally in the Eastern Cordillera and lie in the temperature-zone sabanas, with temperatures ranging from 40° to 74° F. The soil in this area is fine loam to heavy clay but of low fertility, and the area receives only a fair

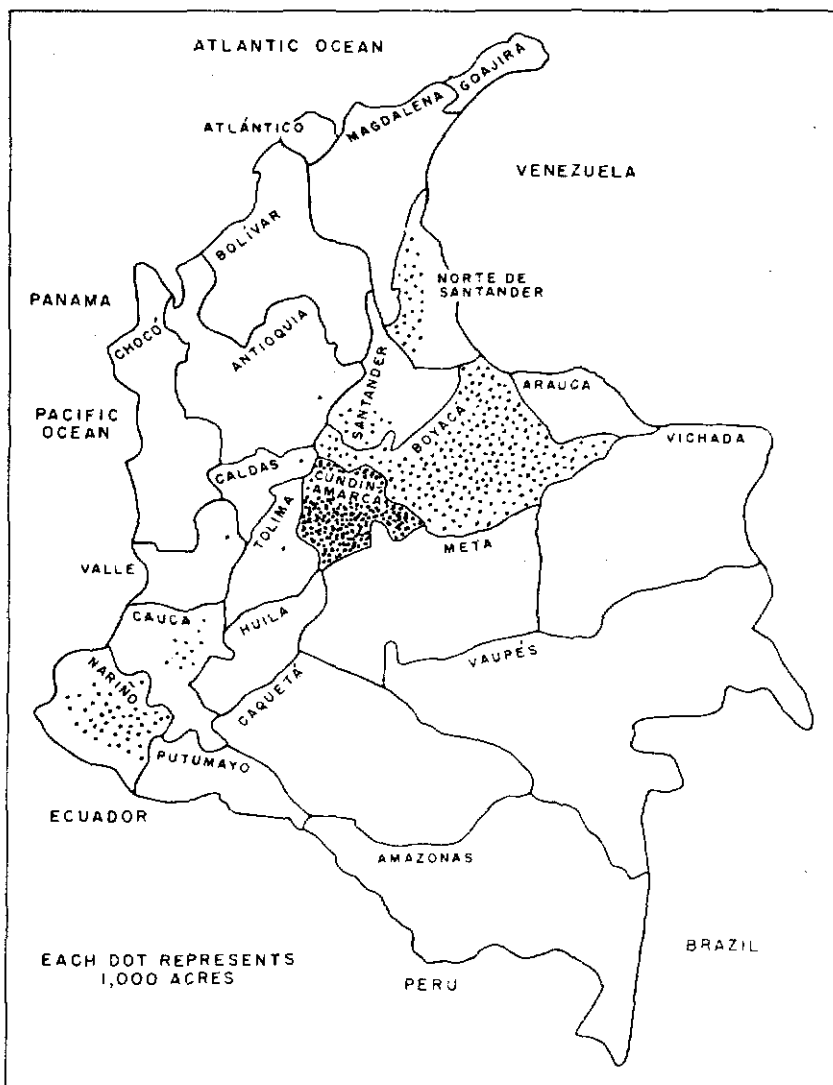


FIGURE 29.—Wheat acreage in Colombia, 1937-38

amount of rain. Most of the wheat is grown on sloping hillsides up to 10,000 feet in elevation.

Colombian wheat is dark in color, and there are many varieties grown. They are usually rust-resistant and produce a good-quality grain, although the yields are very low. The average yield per acre for the country has varied between 6.8 and 10.5 bushels during the

past decade. In 1937-38, when the country average was 6.8 bushels to the acre, the Department of Boyacá averaged 5.5 bushels and Cundinamarca averaged 8.2 bushels. The Department of Tolima had the highest average yield, with 20.9 bushels. The yield on the 223 *fincas* cultivating between 75 and 250 acres of wheat was higher than for any other size area, running 15 bushels per acre higher than the average yield for the country.

Most of the land planted to wheat is cultivated by farmers owning their own farms. Of the total area planted in 1937-38, 82 percent was cultivated by owners. There were 17,580 tenants and sharecroppers cultivating 89,631 acres of wheat, or an average per tenant farm of 5.1 acres.

METHODS OF PRODUCTION

Methods of cultivation of wheat in the eastern section are very crude. So-called plowing is usually done with a crooked stick, and any additional tilling that is attempted is performed with the hoe and the machete. The ruggedness of much of the land makes the use of machinery impossible. Here, again, the difficult and high-cost transportation from the *sabanas* to the coast or from one interior market to another does not stimulate improved methods, which would increase the produce. On the level country around Bogotá, there is some use of machinery, and in the Cauca Valley a few large producers use modern methods.

Until very recent years, there was no selection of seed, no crop rotation, no use of fertilizer. There are records of pieces of land on the *Sabana de Bogotá* that have been planted to wheat for 40 consecutive seasons without application of fertilizer.

Seed is sown by hand and the grain harvested by hand with a sickle. On the small hillside farms oxen and mules still thresh the grain by tramping and the wind blows away the chaff.

Grain is usually planted in Boyacá between March and May, and harvested between October and January. In Cundinamarca, planting is done in February, March, and June, and the crop harvested in August, October, and December. The length of the growing season varies with the elevation.

CONSUMPTION AND TRADE

All the wheat produced in Colombia is purchased by local millers and consumed in domestic markets, with the exception of a negligible amount sometimes shipped to Venezuela. It has been necessary to import wheat and some wheat flour to fill requirements, especially of coast cities. Most flour mills are located in the producing areas. With the high-cost, difficult transportation, wheat from the highlands cannot move down into the coast cities and sell at prices that the consumer can pay. The retail price of wheat at Bogotá has varied between \$2.35 and \$2.45 per bushel in recent years.

The local consumption of wheat has been increasing, and the proportion of the total imported has declined. In 1930, 38 percent of total wheat requirements was imported, but by 1937 this proportion had declined to 14 percent (table 28).

TABLE 28.—*Production, imports, and consumption of wheat in Colombia 1928-39*

| Year | Production | Imports | Consumption | | Year | Production | Imports | Consumption | |
|------|------------|-----------|-------------|---------------------|------|------------|-----------|-------------|---------------------|
| | | | Total | Proportion imported | | | | Total | Proportion imported |
| | 1,000 bu. | 1,000 bu. | 1,000 bu. | Percent | | 1,000 bu. | 1,000 bu. | 1,000 bu. | Percent |
| 1928 | 1,503.2 | | | | 1935 | 3,755.5 | 483.2 | 4,238.7 | 11.4 |
| 1930 | 1,966.9 | 1,200.1 | 3,167.0 | 37.9 | 1936 | 4,532.2 | 593.9 | 5,126.1 | 11.6 |
| 1931 | 2,824.4 | 899.9 | 3,724.3 | 24.2 | 1937 | 3,335.1 | 540.1 | 3,875.2 | 13.9 |
| 1932 | 2,478.0 | 366.5 | 2,844.5 | 12.9 | 1938 | | 582.6 | | |
| 1933 | 2,820.5 | 310.8 | 3,131.3 | 9.9 | 1939 | | 1,258.0 | | |
| 1934 | 3,633.8 | 386.5 | 4,020.3 | 11.7 | | | | | |

Contraloría General de la República de Colombia (7) and International Institute of Agriculture (18).

The United States and Canada have supplied the bulk of both the wheat and the flour imports. The United States share of the market was formerly much larger than it has been lately. The import statistics for country of purchase show the United States as the leading supplier, but in recent years the statistics of actual country of origin give the lead to Canada. Apparently some Canadian wheat and flour move through the New York market and are recorded as imports from the United States. In 1939, of the total of 75 million pounds of wheat imported, Canada supplied 55 million pounds and the United States 15 million. Only the best hard wheat can be imported into the coast country because of the climate. Imports of wheat flour have declined drastically since the 1920's, from 169,000 barrels in 1928 to 18,619 barrels in 1938. The greater portion was supplied by the United States. In some years Canada has taken the lead in supplying flour as well as wheat.

GOVERNMENT POLICIES

The Government has tried to increase wheat production to take care of domestic requirements. A high protective-tariff policy has been followed, although the degree of protection has varied considerably over the past three decades. Apparently wheat production has responded to these efforts, although comparable estimates on acreage are not available over the period to indicate the degree of response. During the first World War, production was increased, perhaps because of the high duties then in force. During the twenties the duties on foodstuffs were reduced. They were raised again in 1931, the duty on wheat being increased fourfold, and production again responded. The extremely high tariffs on wheat during this latter period (\$1.88 per bushel for wheat and \$7.04 per 100 pounds for flour at the exchange rate then current) brought more land into production and increased the movement of wheat from the highlands to the coast cities, but imported wheat continued to be brought in. The tariff duty on imported wheat in 1940 was \$1.24 a bushel.

The Government in 1933 organized a campaign to encourage expanded production. The agronomist heading the wheat commission, then appointed, has seven helpers located throughout the country. Two branches are located in the Department of Boyacá and one each in Cundinamarca, Cauca, Nariño, Tolima, and Valle. The activities of the commission have included experiments in seed selection in an

attempt to obtain varieties that at the same time resist disease and yield a high quality and a large quantity of wheat. So far, 10 varieties have been developed in the experiment stations which seem to give good results when tried on particular farms. In 1938 the Government proposed to cultivate 2,400 acres of the new wheat varieties in order to supply the seed to farmers, along with instructions regarding the type of soil, the climate, and the cultivation methods best suited to each variety. The Central Experiment Station, in La Picota, is equipped with modern laboratories and grading machinery and works closely with the commission. Government grading machines are available for the use of the public, but they were little used before 1938 (12).

Further steps were taken in July 1940 to stimulate domestic production, when the importation of wheat was limited by decree. From July 1940 to December 31, 1941, the *Exchange and Export Control* Office was forbidden to issue import permits for wheat in excess of 588,000 bushels. During the calendar year 1942, the limit is 294,000 bushels. No wheat is to be imported after 1942, unless the domestic crop is insufficient to meet requirements. The quantity imported is to be apportioned to 10 domestic mills by means of the import licenses. A further provision made at the same time permits the mixture of yuca flour with wheat up to 25 percent of the total.

CACAO

Cacao is a tropical-tree product, native to Latin America. Production in Colombia once supplied the needs of the country, and exports were made fairly regularly until 1910, although they were of only minor importance in the total trade picture. Lately domestic production has not been sufficient to meet domestic needs, and substantial quantities have been imported. Production averages about 23 million pounds and imports from 3 to 9 million pounds, or from 14 to 30 percent of domestic consumption.

Interest in cacao cultivation has been increasing, and the acreage devoted to cacao trees was expanded from an average of 45,000 acres in the period 1925-29 to 81,000 acres in 1937-38. Cacao is one of the most valuable crops in Colombia, giving a high yield and a large profit per acre. The value of the production in 1937-38 was just under 3.4 million dollars.

DESCRIPTION OF THE INDUSTRY

Cacao is similar to coffee in that it grows best at altitudes of 3,000 or 4,000 feet. The most important producing area is the Cauca Valley and the foothills surrounding the valley. The two Departments of Cauca and Valle produced 68 percent of the total production in 1937-38, although the acreage in these Departments was only 45 percent of the total for the country. Huila had the largest acreage devoted to cacao, 24,463 of the total 81,402, but produced only 10 percent of the total outturn (fig. 30 and appendix table 53). The order of importance of the various Departments would be changed if production were shown rather than acreage.

TABLE 29.—Number of trees and production of cacao in Colombia on farms of different sizes, as percentage of total, 1937-38

| Number of trees in production per farm | Number of farms growing cacao | Trees in production | Share of production |
|--|-------------------------------|---------------------|---------------------|
| | Percent | Percent | Percent |
| Under 100 | 9.62 | 0.43 | 0.44 |
| From 100 to 500 | 35.52 | 6.64 | 7.18 |
| From 500 to 1,000 | 22.80 | 10.00 | 10.33 |
| From 1,000 to 5,000 | 27.42 | 38.68 | 38.65 |
| From 5,000 to 10,000 | 3.11 | 12.06 | 11.47 |
| Over 10,000 | 1.53 | 31.29 | 32.28 |

The cacao tree is subject to two very destructive diseases. They are both caused by fungi and are favored by damp weather. One of these, witches'-broom (*Marasmius perniciosus* Stahel), has infected and is destroying the plantations in the English colonies and elsewhere. The other disease, phytophthora rot, is perhaps less destructive than witches'-broom.

The cacao trees have been free from these diseases in the arid interior valleys of Colombia, but the diseases are present in other sections of the country. Technical experts believe that the geographical factor of greater height above sea level is important in preventing the spread of the diseases. Other factors may be the dry atmosphere, low average rainfall, and slight amount of dew, which hinder the germination of the spores of fungi. Cultivation under irrigation in the arid interior valleys and in some arid regions of the north coast in Magdalena could be extended to advantage.

Cacao is usually grown by small landowners. Only 14 percent of the total acreage in cacao trees was cultivated by sharecroppers and tenants in 1937-38.

METHODS OF PRODUCTION

Profitable cultivation of cacao trees requires care and attention as well as good technical knowledge. The industry in Colombia has suffered because the methods of cultivation and harvesting have been inferior to those used on plantations in the principal producing countries.

Like coffee, the cacao tree is grown best under shade, where it is protected from the hottest rays of the sun. Planting in the good producing regions takes place in June and December, and throughout the rest of the country in October, November, and December. The trees begin to bear several years later, and the pods are harvested during the first 9 months of the year. The yield of cacao beans is greatest in the Department of Magdalena, where the average per acre was 1,180 pounds in 1937-38, or 5.93 pounds per tree. However, the total production there was low. In the Cauca Valley, yields ran from 360 to 600 pounds per acre, and the average for the country was 308 pounds, 2.03 pounds per tree (appendix table 53).

CONSUMPTION AND TRADE

Colombia's entire production of cacao is now consumed within the country, although minor exports were made until 1915 (table 30). During recent years, however, very little cacao has been exported,

and imports of between 14 and 30 percent of domestic requirements have had to be made (table 31).

TABLE 30.—*Cacao exports from Colombia, 1906-32*

| Year | Exports | Year | Exports |
|------|---------------------|------|---------------------|
| | <i>1,000 pounds</i> | | <i>1,000 pounds</i> |
| 1906 | 1,164 | 1920 | |
| 1907 | 1,868 | 1921 | |
| 1908 | 1,369 | 1922 | (¹) |
| 1909 | 1,725 | 1923 | 3 |
| 1910 | 655 | 1924 | (¹) |
| 1911 | 749 | 1925 | 117 |
| 1912 | 255 | 1926 | (¹) |
| 1913 | 483 | 1927 | |
| 1914 | | 1928 | 5 |
| 1915 | 717 | 1929 | 1 |
| 1916 | 220 | 1930 | 17 |
| 1917 | 12 | 1931 | (¹) |
| 1918 | 43 | 1932 | 2 |
| 1919 | 14 | | |

¹ Less than 500 pounds.

Brazil and Costa Rica are the major sources of supply for Colombian cacao imports. In 1939, 53 percent of the imports originated in Brazil and 32 percent in Costa Rica. However, almost half the Brazilian product entered Colombia through the United States.

Since Colombia is well suited for the production of cacao, with the proper encouragement of the Government in providing technical aid to the growers and in financing them in getting started, Colombia could become self-sufficient in this crop.

TABLE 31.—*Production, imports, and consumption of cacao in Colombia, 1932-39*

| Year | Production | Imports | Consumption | |
|------|---------------------|---------------------|---------------------|---------------------|
| | | | Total | Proportion imported |
| | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>1,000 pounds</i> | <i>Percent</i> |
| 1932 | 23,736 | 3,367 | 27,103 | 12.4 |
| 1934 | 22,046 | 9,414 | 31,460 | 29.9 |
| 1936 | 21,197 | 9,232 | 30,429 | 30.3 |
| 1937 | 25,042 | 4,117 | 29,159 | 14.1 |
| 1939 | | 10,060 | | |

GOVERNMENT POLICIES

The Government has a most promising opportunity to foster expanded production of cacao. An import duty of approximately 63/4 cents a pound has not been sufficient to encourage production to the self-sufficiency level. However, a commission has been established to work in the zones considered best for cacao cultivation. They include Alto Huila, in the Department of Huila, Alto Cauca, in the Departments of Cauca and Valle, and Sopetrán, in the Department of Antioquia. The commission is concerned with methods of seed selection, sowing, adequate shade, careful cultivation, irrigation and drainage, classification and sale of beans, etc. These tasks are all carried out on the farmers' lands so they can see the results of the work. The commission is composed of a chief agronomist and several assistants.

RAW-MATERIAL CROPS

The two most important raw-material crops grown in Colombia are cotton and tobacco. Domestic production of these crops furnishes the major portion of the raw material for the two most important industries. Figue, a hard fiber used primarily in the manufacture of bags, is becoming an increasingly important raw material.

COTTON

Cotton has been cultivated in Colombia in a rudimentary way since colonial times, especially in the Atlantic coast region. It was produced for export during most of the nineteenth century, although on a very small scale. Exports varied between 100 and 1,000 tons from 1870 to 1900. Shipments were made largely to New Orleans.

About half the cotton grew wild. Production was stimulated during the World War, and by 1917 the estimated area in cotton was 19,000 acres and in 1918 was 24,000 acres. Cotton was produced in Atlántico and Magdalena along the river on plantations ranging in size from 60 to 375 acres. The average yields were about 240 pounds of lint to the acre.

Acreages have been increasing, especially in recent years, the 1937-38 area planted to cotton being almost 107,000 acres. Production in this same year was almost 27,000 bales of lint cotton. Recently domestic production has supplied from 36 to 56 percent of total mill requirements.

Cotton growing is important only for domestic consumption in the expanding textile industry. Colombian production is insignificant in total world supply. With the growth of the textile industry, Colombia has shifted from an exporter of cotton to an importer, although it is now producing over half the domestic requirements.

Cotton growing is an important part of the agricultural picture on the Atlantic coast and is becoming increasingly so in the Tolima and Cauca Valleys and the Río Suárez Basin. Since the Government is encouraging expansion in cotton production as part of its drive toward self-sufficiency, it may become of greater importance in these regions. The value of the domestic cotton crop in 1938 was almost 2 million dollars, or 40 percent of that of the commercial banana production.

DESCRIPTION OF THE INDUSTRY

LOCATION

The best section for growing cotton is along the Magdalena River south of Barranquilla, although the entire Caribbean coast for 80 miles inland is adapted to cotton growing.

Cotton is grown in most of the Departments, but the large producers are Atlántico, Magdalena, Tolima, Santander, Bolívar, and Boyacá (ranked according to production in 1937-38). The principal zone of cultivation is the Atlantic coast region, and until recent years the three Departments of Atlántico, Magdalena, and Bolívar were the most important producing regions, accounting for 80 percent of the total crop. Even in 1937-38, 83 percent of the 107,000 acres in cotton was located in these Departments, although they produced only 64 percent of the total crop.

About 1935 cotton production was started in the northern section of Tolima around Armero, and in 1937-38 this Department had reached third place in production. Cultivation there has been on a

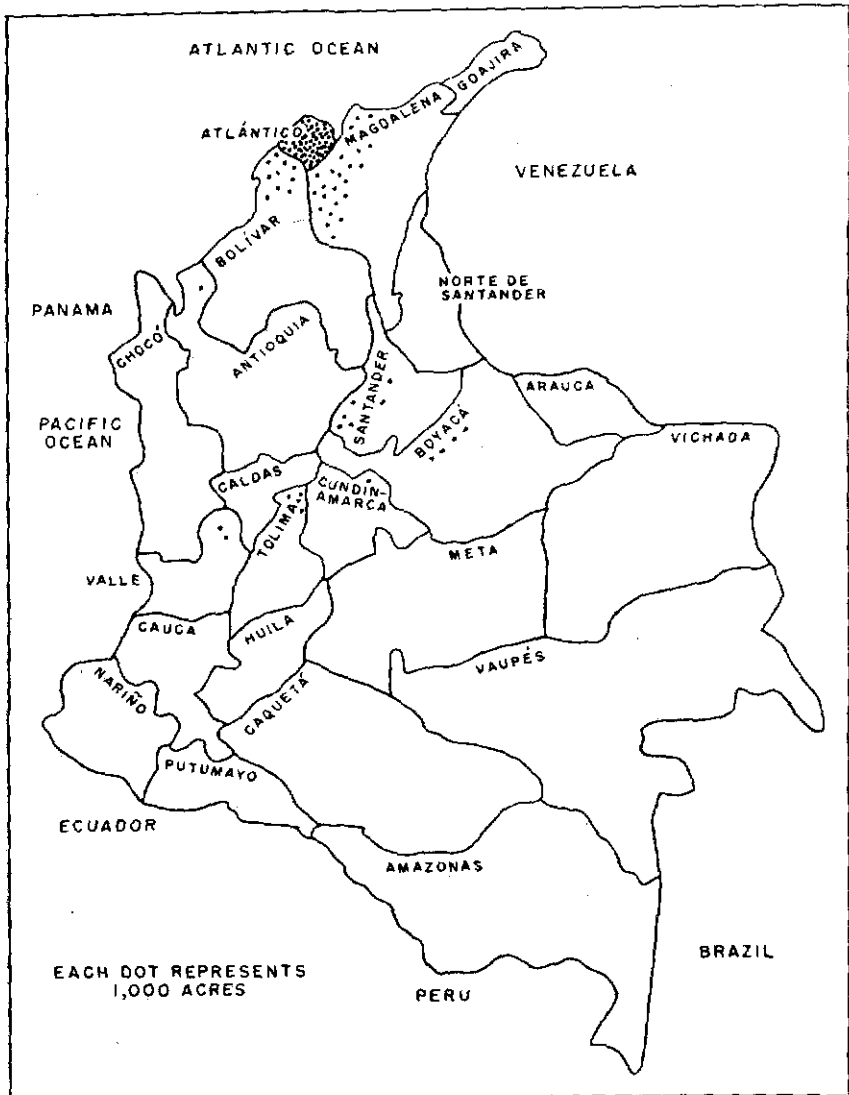


FIGURE 31.—Cotton acreage in Colombia 1937-38.

large-scale basis, but the costs have been so high that producers are becoming discouraged. The Río Suárez Basin in Santander and Boyacá is another major producing zone. It is thought that this may have been where the first commercial cotton was grown in Colombia (fig. 31).

NUMBER AND SIZE OF FARMS

There were fewer than 5,000 farms producing cotton in 1937-38, almost 2,000 of them in the tiny Department of Atlántico on the coast and another 2,000 in the two Departments of Bolívar and Boyacá.

Except for a few mill-owned cotton plantations, cotton is grown by small independent farmers who also raise other crops. In the Department of Atlántico, for example, the average-sized farm on which cotton was grown in 1937-38 was 156.2 acres, but the average area devoted to cotton was only 29 acres. In Tolima, where production was started only in 1935, the average-sized farm on which cotton was grown was 1,603 acres, and the average area devoted to cotton only 76 acres (appendix table 54). Sixty-two percent of the cotton farms cultivated less than 12 acres of cotton (table 32). These farms accounted for less than 15 percent of the total area in cotton and produced less than 15 percent of the total crop (7).

TABLE 32.—Area and production of cotton in Colombia on farms of different sizes, as percentage of total, 1937-38

| Area in cotton per farm (acres) | Number of farms producing cotton | Area in cotton | Production of cotton | Area in cotton per farm (acres) | Number of farms producing cotton | Area in cotton | Production of cotton |
|---------------------------------|----------------------------------|----------------|----------------------|---------------------------------|----------------------------------|----------------|----------------------|
| | <i>Percent</i> | <i>Percent</i> | <i>Percent</i> | | <i>Percent</i> | <i>Percent</i> | <i>Percent</i> |
| Less than 12..... | 61.99 | 14.58 | 14.16 | 126-250..... | 1.91 | 15.98 | 19.99 |
| 12-25..... | 18.30 | 16.16 | 15.09 | 251-370..... | .21 | 3.20 | 3.94 |
| 26-50..... | 10.73 | 18.37 | 16.64 | 371-500..... | .18 | 3.30 | 4.64 |
| 51-125..... | 6.56 | 23.75 | 22.11 | Over 500..... | .12 | 4.66 | 3.43 |

SOILS AND CLIMATE

Certain sections have ideal climatic and soil conditions for cotton. The Magdalena River section, with its brown to black fine sandy loam and clay soils, has good natural conditions for cotton growing, and in Valle the soil is rich in humus, in places resembling the black wax country of Texas. The cotton areas have two seasons, a long rainy one from April to October, with about 30 or 40 inches of rain, and a very dry one the remainder of the year, when the cotton is maturing for harvest.

VARIETIES

Colombia possesses a good-quality criollo cotton, a perennial, which is indigenous to the country. However, both perennial, or tree cotton, and annual cottons are grown. The Bourbon variety, a perennial plant that produces for 4 or 5 successive years without replanting, predominates in the coast region. Some annual cotton is grown in this section, although it does not flourish without technical equipment and careful attention, both of which are scarce in the hot coastal zones.

An annual variety known as Lengupá is cultivated in the Río Suárez Basin. It is of medium length, resistant to disease, and highly popular in the textile factories.

The farmers in the Armero zone in Tolima are using the varieties Vergara, Acala, and Tolima 27, cottons of medium fiber length suitable for fine cloths.

The perennial plants produce a small crop the first year and do not come into full bearing until the second season. In sections where the rainfall is ample, two crops can be harvested in a single year.

Both the annual and the perennial cottons produce good fibers of from 1- to 1 $\frac{3}{8}$ -inch lengths, but because of the bad picking practices, irregular lengths, and dirt they do not grade high.

PESTS AND DISEASES

Pests and diseases are particularly destructive to Colombian cotton. The long growing season favorable to cotton is also favorable for the increase of these enemies. In the northern coastal plain, the pink bollworm is present, but it has not yet penetrated to the interior valleys. However, there is another species of bollworm, larger than the pink bollworm, which is distributed throughout the country. It is, if anything, more destructive than the pink bollworm in the United States. The variety in Colombia attacks the stalks of the cotton and causes great damage. Aphids and mites are dangerous in the dry, arid regions. A virus disease is also spreading rapidly, but has not yet reached the Tolima Valley area.

Tree cotton provides good hiding places for insects, and it is difficult to control them. Very little has been done to combat cotton pests and diseases, and they offer perhaps the greatest obstacle to profitable cotton cultivation.

METHODS OF PRODUCTION

Most of the farmers growing cotton have no knowledge of proper agronomic practices, and cultivation and harvesting are primitive. In the coast regions the ground is prepared for planting in March or July, or both, by cutting the brush out with machetes and burning it. The planting season in the three coast regions is in April or August, or both. Cotton is planted in rows from 2 to 4 feet apart, and the field is then allowed to take care of itself for the next 4 or 5 years except at harvesttime. Occasionally the trees are topped in an effort to increase the yield and prevent the plant from going to wood. The plant often attains a height of 20 feet.

Picking in the coast regions begins in February. Sometimes at least 20 percent of the crop is left in the field because of inefficient picking. The long branches are sometimes broken off and only pieces of bark left to hold them to the trees. The green bolls on these broken branches open, and the soft, immature fiber is picked along with the well-matured fiber. As a result, the crop is not uniform and cannot be graded to enter foreign trade.

There are a few scientifically managed plantations, such as those owned by the Óregon Cotton Mill at Barranquilla. This mill owns 2,500 acres of land in Magdalena and distributes free seed to the growers in an attempt to improve the cotton grown.

In the Río Suárez Basin the land is not plowed, and cotton is planted in combination with other crops, such as corn and yuca. Cultivation is done by small farmers who do not own their own land. The owner furnishes the land and receives half the crop as rent.

The Armero zone is cultivated by large-scale operators who use machinery for all the operations of cultivation and harvesting. How-

ever, the initial cost of breaking the ground, buildings, machinery, labor, etc., has been so high that most of the crops have resulted in a loss to the producer.

Production has averaged about 20,000 bales, the average yield for the country being 120 pounds of ginned cotton per acre, or about half the United States average. The yield in the largest producing Department, Atlántico, is a third less than this; and the yield in Tolima is four times the country average, or nearly a bale an acre. This compares favorably with the yield in the large cotton-growing areas of the United States.

MARKETING

There are no cotton exchanges or cotton brokers in Colombia. A large portion of Colombian cotton is marketed through the Algodonera Colombiana, a joint stock company organized in Medellín in 1932. Most of the large mills make their purchases through this organization, although there is one large mill that deals directly with the growers. A Cotton Control Board, set up by the Government, supervises all transactions in cotton.

The Algodonera Colombiana purchases cotton direct from the plantation or the cooperatives through agencies established in Barranquilla, Cartagena, Sitionuevo, Armero, Montería, and Dabeiba. The organization determines prices and purchases direct from the grower, payments being made at the time of purchase. It also gins the cotton on the plantations so that it can be shipped directly to the mills.

Medellín is the center of the cotton-textile industry, about three-quarters of the capital invested in the industry being located there. Other market centers are Bogotá and Barranquilla.

All Colombian cotton is utilized in the domestic textile factories. The type of cotton produced in some parts of the country, however, is of longer fiber than can be used advantageously in the type of machines common in Colombia. On the other hand, the fiber varies in length and contains so much dirt that it cannot compete in foreign markets with cottons from the United States and Brazil. Before 1938, the mills bought foreign cotton in preference to the domestic product, and the price to domestic producers was low. After much study of the situation, the Government supervised the allocation of domestic cotton to the different mills at a fixed price. This move, together with licensing of imports, insured the sale of domestic cotton.

AIDS TO THE INDUSTRY

GOVERNMENT POLICIES

The Government has maintained a high import duty on cotton in line with the general policy of developing a self-sufficient economy. A law of 1926 set aside \$300,000 for the development of the cotton industry. A third of this sum was used to establish a model cotton-growing plantation in the Department of Valle; the rest was distributed among cotton-growing Departments. The Government was authorized to regulate the growing of cotton, the preparation of fiber for export, the selection of seed, etc. The Government limited the importation of cotton in 1938 by means of import licenses in order to stimulate further the use of domestic cotton in textile mills. Licenses

were issued only for enough cotton to supplement domestic production, not to compete with it.

A decree of February 28, 1938, created the Cotton Control Board, which was to (1) study different types of cotton produced to determine how much of each type could be used domestically; (2) study the needs of the textile industry as to quantity and quality of cotton consumed; (3) study means to classify cotton; (4) establish general norms of cultivation in determined zones; (5) determine the manner of distributing internal consumption among mills; (6) determine the quantity to be imported to supplement domestic production.

The Government has also established a commission, or *campana*, to encourage the production of cotton. The work of the commission has consisted primarily of the selection of better seed and its free distribution to growers, the importation of insecticides and their sale at low prices to combat pests and diseases, and the purchase and distribution of equipment. The commission is controlled by a chief agronomist with assistants in the Departments of Boyacá, Santander, Magdalena, and Valle.

The Government continues to support cotton growing even though it has not been economically profitable. In December 1940 a degree provided that 90 percent of the profits from seignorage of nickel used in coining may be used by the *Cooperativa del Atlántico* to promote the industry.

EXPERIMENT STATIONS

Three experiment stations are available for experimental work on cotton, one each at Armero, Barranquilla, and Buga. The Armero station has developed better varieties of fiber and distributed them among the farmers in the region, and the station at Barranquilla is attempting to develop varieties that will be resistant to the predominant diseases, have a good yield, and be suitable for commerce.

COOPERATIVES

The five leading cotton cooperatives are operating in Colombia in an effort to improve cotton prices. One of the most important is the *Cooperativa del Atlántico*, at Barranquilla, which was founded on August 5, 1935, to help finance the growers. The cooperatives sell their cotton either to the Algodonera or direct to the textile factories. The four other leading cotton cooperatives are the *Cooperativa Algodonera*, Girardot; *Cooperativa Algodonera del Río Suárez*, Santa Ana; *Cooperativa Algodonera del Tolima*, Armero; and *Asociación de Compradores Colombiana*, Medellín.

SELF-SUFFICIENCY

As the domestic textile industry has expanded, Colombia has shifted from an export to an import basis for cotton. During recent years it has been necessary to import from 35 to 66 percent of total mill requirements (table 33).

The desire for self-sufficiency in cotton production is strong, and an import duty of 2.6 cents is levied on each pound imported in an effort to encourage the expansion of domestic production. Imports

must now enter under license and be limited to the amount of the deficit above domestic production.

TABLE 33.—*Production, imports, and consumption of cotton, Colombia, 1934-35 to 1938-39*¹

| Year | Production | Imports | Consumption | |
|--------------|--------------|--------------|--------------|---------------------|
| | | | Total | Proportion imported |
| | <i>Bales</i> | <i>Bales</i> | <i>Bales</i> | <i>Percent</i> |
| 1934-35..... | 14,493 | 11,505 | 25,998 | 44.3 |
| 1935-36..... | 13,202 | 16,817 | 30,019 | 56.0 |
| 1936-37..... | 20,526 | 11,702 | 32,228 | 36.3 |
| 1937-38..... | 26,940 | 15,156 | 42,096 | 36.0 |
| 1938-39..... | 23,269 | 20,515 | 43,784 | 46.9 |

¹ In bales of 478 pounds.

As a result of the determined efforts of the Government, it may be possible for the country to become self-sufficient in this crop. However, the difficulties to be overcome are tremendous and the cost is large. The agricultural commission from the United States in 1940 strongly recommended that the Government investigate the economic factors of cotton production, as well as the relative advantages of producing it as against some other crop in the same area.

SOURCE OF IMPORTS

The United States has been the largest supplier of Colombian imports of cotton, providing about 95 percent of the total in most years (fig. 32). In 1940, however, Brazil and Peru entered the market and together supplied about one-fourth of the total, the United States share shrinking to 70 percent. Brazilian and Peruvian cotton have been selling for 8 to 10 percent less than American cotton, but there has been some dissatisfaction with the Brazilian product, which does not always correspond to previous samples.

TOBACCO

Tobacco has been cultivated in Colombia since early colonial days. During the latter part of the nineteenth century from 2,000 to 4,000 tons of leaf tobacco were exported each year. Colombia now exports tobacco and also imports small amounts of tobacco, cigarettes, and cigars. The relative importance of tobacco exports declined sharply during the 1930's.

Production has varied during the past 20 years from 15 to 33 million pounds, and the acreage from 16,000 to 41,000 acres (table 34).

Tobacco production furnishes the raw material for Colombia's second most important manufacturing industry. Seventy-two factories are engaged in this industry. Seven of the factories are capitalized at over 100,000 pesos each, and one at over a million pesos.

The total investment in the industry is approximately 4.8 million pesos. The *Compañía Colombiana de Tabaco*, the largest in the country, is a very flourishing concern.

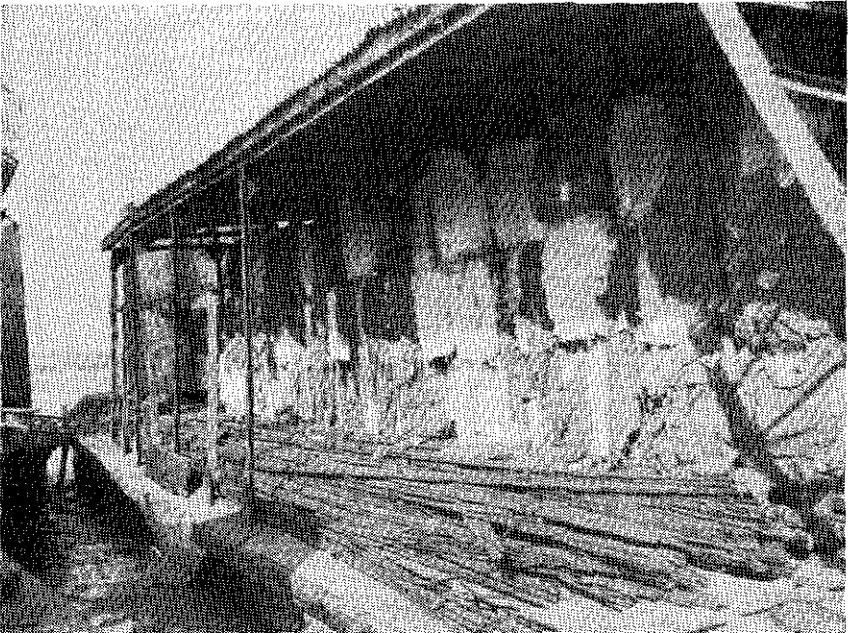
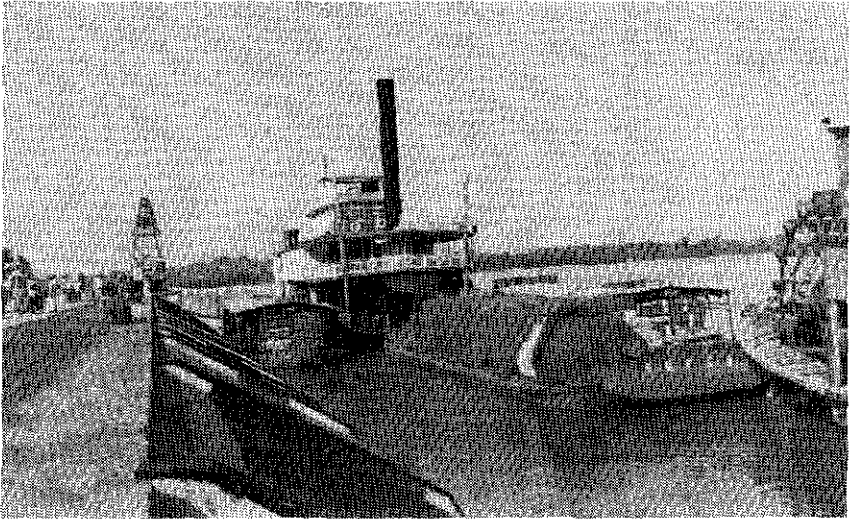


FIGURE 32.—American cotton at Puerto Berrio on the Magdalena River.

TABLE 34.—*Area, production, and yield of tobacco in Colombia, 1915-37*

| Year of harvest | Area | Production | Yield per acre | Year of harvest | Area | Production | Yield per acre |
|-----------------|------------------|------------------|----------------|-----------------|------------------|---------------|----------------|
| | <i>Acres</i> | <i>Pounds</i> | <i>Pounds</i> | | <i>Acres</i> | <i>Pounds</i> | <i>Pounds</i> |
| 1915..... | 16,743 | 14,321,838 | 855 | 1929..... | (¹) | | |
| 1919..... | (¹) | 28,218,880 | | 1930..... | (¹) | 18,552,282 | |
| 1920..... | (¹) | 16,534,500 | | 1931..... | (¹) | 15,508,155 | |
| 1921..... | (¹) | 17,416,340 | | 1932..... | 17,334 | 18,347,952 | 1,058 |
| 1923..... | (¹) | (¹) | | 1933..... | (¹) | 16,662,997 | |
| 1924..... | 38,827 | 26,291,839 | 677 | 1934..... | 21,765 | 24,293,700 | 1,116 |
| 1925..... | 39,091 | 27,606,222 | 706 | 1935..... | (¹) | 22,412,782 | |
| 1926..... | 40,920 | 28,434,490 | 695 | 1936..... | (¹) | 23,596,804 | |
| 1927..... | 31,703 | 22,046,000 | 695 | 1937..... | 37,282 | 32,691,808 | 877 |
| 1928..... | 17,544 | 19,552,597 | 1,114 | | | | |

¹ Not available.

DESCRIPTION OF THE INDUSTRY

LOCATION

The Department of Santander is the most important tobacco-growing district, although the chief exporter is Bolívar. These two Departments produced 65 percent of the total product in 1937-38 and accounted for 66 percent of the total acreage. Antioquia, Tolima, and Valle produce substantial quantities, but the other Departments grow very little (fig. 33 and appendix table 55).

About three-fifths of the land of Bolívar is excellent for tobacco cultivation. In Santander the topsoil is rich, and the subsoil is good. Rainfall, however, is irregular.

The Department of Santander produces about 70 percent of the tobacco consumed in Columbia, largely in the municipalities of García Rovina and Zapatoca in the river valleys of Chicamacha, Suárez, Fonce, Sogomoso, Rionegro, and Cañaverales. The most important producing district in Bolívar is Ovejas, although some is produced in Carmen, San Jacinto, Sincé, and Chalan.

NUMBER AND SIZE OF FARMS

There were in 1937-38 about 13,000 farms on which 37,000 acres of tobacco were cultivated. Production is largely in the hands of small producers who own from 5 to 8 acres each. The average area in tobacco was 2.8 acres per farm and the yield per acre about 877 pounds.

The average area cultivated in tobacco in Santander was 7 acres in 1937-38, and the yield obtained was 736 pounds to the acre. The average area cultivated in Bolívar was 2.1 and in Tolima 2.2 acres. The largest yield per acre was in the Department of Magdalena, where 1,421 pounds to the acre was obtained, although the total production in this Department was low.

METHODS OF PRODUCTION AND CURING

In the principal growing district of Santander, tobacco is grown on the same land every third year. Most tobacco is planted in November and harvested the end of the following March. About 8,000 tobacco plants are planted on an acre. Most of the tobacco cultivated in Bolívar is of low quality and is produced by primitive methods.

As the leaves are cut from the plant, they are placed loosely in wooden boxes until the next day, when they are taken to drying sheds and strung for drying. They are left in the sheds for 18 to



FIGURE 33.—Tobacco acreage in Colombia, 1937-38.

20 days and are then graded and fermented. The leaves are placed in bundles and piled crossways on wooden stands. A thermometer placed in the center of each bulk is examined twice a day, and when the temperature reaches 113° F. the bulks are rearranged. The tobacco is ready for packing at the end of 2 months.

GOVERNMENT POLICIES

The growing and sale of tobacco is strictly controlled under a Government monopoly. To encourage the development and expansion of the tobacco-manufacturing industry, a high protective tariff is in effect on tobacco products. The tariff on cut tobacco and cigarettes is about \$2.60 a pound, although the rate on imports from the United States is just half that, under the terms of the trade agreement between the two countries. The Government also collects a tax on the domestic consumption of tobacco products, the returns from which furnish substantial revenue.

CONSUMPTION AND TRADE

The tobacco factories use most of the domestic production. Since 1920 the manufacturing industry has been expanding and has absorbed an increasing share of total production. Cigarettes and leaf tobacco are also imported for domestic use. Leaf imports have never been important in the total supply, and they have become less important recently. In the 1920's imports represented about 1 percent of domestic leaf production, but they have declined to three-tenths of 1 percent. Cigarette imports have been relatively more important than leaf imports. In 1931, 412,000 pounds of cigarettes were imported, as compared with 139,000 pounds of leaf tobacco.

Imports of tobacco have been largely from the United States and Greece, the two together furnishing over 90 percent of the total. Cigarettes come almost exclusively from the United States. Colombia was the third most important Latin American market for United States cigarettes in 1940.

The general trend of tobacco exports has been downward during the twentieth century, although in 1938 and 1939 there was a sharp increase in the quantity going abroad (fig. 34). Exports have represented a decreasing proportion of total tobacco production, also; however, there has been a wide variation from year to year.

Tobacco exports ranked about fifth in importance in the total trade of the early 1900's, representing from 2 to 5 percent of the total export value. From 1920 on, however, the relative importance of these exports declined sharply, until in 1940 they represented only 0.03 percent of the total export value. Colombian tobacco has gone largely to Europe, and until the war began in 1939 Germany was taking an increasingly large proportion of total tobacco exports (table 35).

TABLE 35.—Percentage of tobacco exports from Colombia to principal markets, 1933-40

| Year | Germany | France | Netherlands | Other countries |
|------|----------------|----------------|----------------|-----------------|
| | <i>Percent</i> | <i>Percent</i> | <i>Percent</i> | <i>Percent</i> |
| 1933 | 40.6 | 48.2 | 10.6 | 0.6 |
| 1934 | 64.0 | 21.1 | 2.5 | 12.4 |
| 1935 | 75.5 | 16.1 | 1.0 | 7.4 |
| 1936 | 56.3 | 18.7 | 6.2 | 18.8 |
| 1937 | 88.7 | 7.0 | 3.2 | 1.1 |
| 1938 | 96.7 | 2.0 | 1.3 | 0 |
| 1939 | 80.4 | 9.7 | 4.9 | 5.0 |
| 1940 | | 28.0 | 74.0 | 0 |

FIQUE

Fique (*Furcraea macrophylla*) is a plant somewhat similar to sisal, with strong but harsh fibers. The plant is native to Colombia and grows wild in many sections of the country. In recent years it has been harvested and manufactured into bags. Its manufacture and use are encouraged by a high tariff on imported jute. Most of

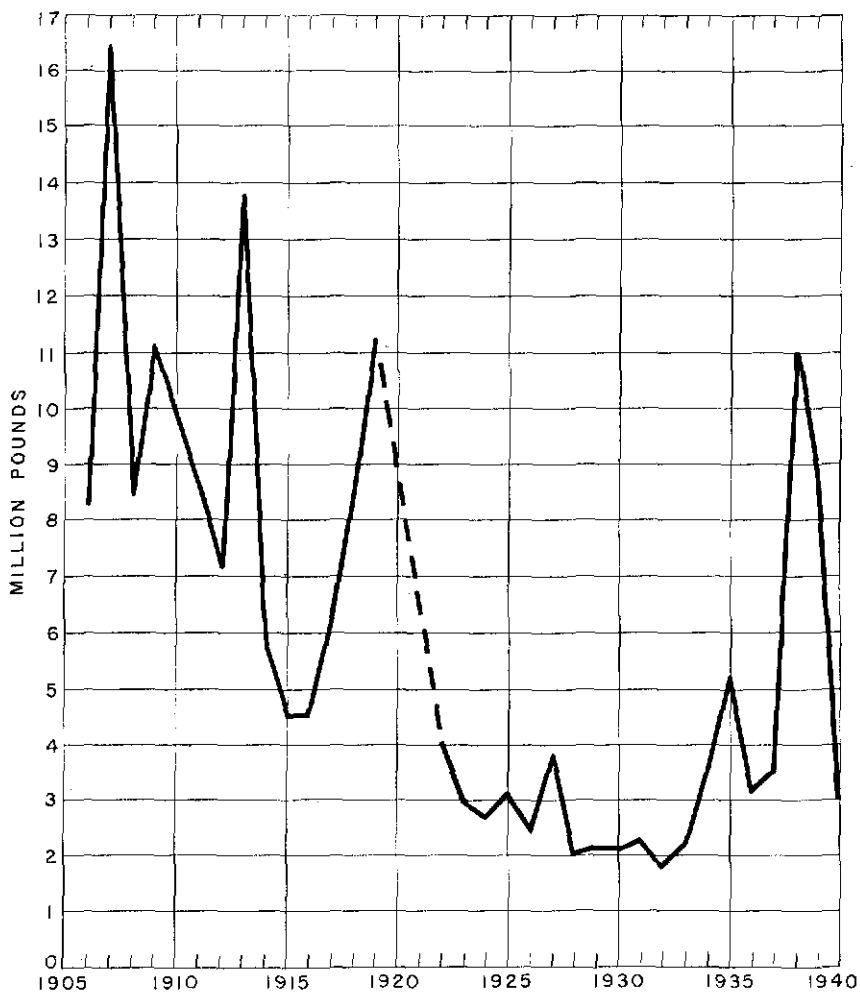


FIGURE 34.—Exports of tobacco from Colombia, 1906-40.

the coffee exported from Colombia is shipped in fique bags. Since the fibers are harsh, they are not suitable for many uses. Even in the coffee bags the fiber is harsh enough to cause much discomfort to the crews loading the coffee at the docks.

A few years ago fique-bag production was a cottage industry centered largely in Santander. Half of the total crop of 22 million pounds was grown in Santander in 1934. A bag factory was erected

in Medellín in 1939, and by 1940 figue plantations had been started in other Departments. Santander was still the principal producer with 32 percent of the total of 28 million pounds, but production in Antioquia and Cundinamarca had increased to 28 and 15 percent, respectively (appendix table 56). About 10 million bags are now produced from figue. From 4 to 5 million are used for coffee exports and most of the rest for other products in Colombia. A few are exported.

Growing conditions are excellent for the figue plant, and there is no doubt that it could be grown in larger quantities for export. However, its export possibilities depend on successful research to develop a process for softening the fiber. It could then perhaps compete in the consuming markets with jute.

LIVESTOCK

By far the most important type of livestock in Colombia is cattle. Cattle raising has been one of the principal industries since colonial days. Hog raising has never developed to any extent, although hogs thrive on the slopes of the Central and Eastern Cordilleras. It is difficult to obtain accurate data on livestock numbers in Colombia, but the relative importance of the different types for selected years is indicated in table 36.

TABLE 36.—*Livestock in Colombia, selected years*

| Year | Cattle | Hogs | Sheep | Goats | Horses | Mules | Asses |
|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> | <i>Thousands</i> |
| 1916 | 4, 832 | 1, 139 | 246 | 232 | 858 | 324 | 168 |
| 1925 | 6, 476 | 1, 366 | 780 | 407 | 978 | 354 | 138 |
| 1930 | 7, 343 | 1, 434 | 810 | 427 | 929 | 329 | 149 |
| 1934 | 7, 972 | 1, 622 | 872 | 544 | 972 | 476 | 303 |
| 1937 | 7, 592 | 1, 545 | 831 | 518 | 926 | 453 | 288 |
| 1938 | 8, 112 | 1, 900 | 1, 000 | 600 | 1, 000 | 500 | 306 |

CATTLE (13)

There were no cattle at all in South America before the Spanish conquest. The Spaniards brought them into the continent from the Basque Provinces of northern Spain. Friar Pedro Simón, a Spanish historian, says that in 1540 Alonso Luis de Lugo reached the north coast with 200 horses and 35 cows and bulls. From the coast, the cattle moved over into the sabanas of the Valle de Upar and later were sent down the Magdalena River to Tolima. So far as is known, the cattle introduced by the Spaniards were of the Andaluz Charoles race. In the colonial period, land was abundant and labor scarce—a condition that led to the development of the cattle industry.

During the early years of independence, cattle raising became one of the most important industries in the country. There was some exportation of cattle in the early 1900's, but the industry is developed largely for the domestic market, and recently it has been necessary to import cattle. Even though the production of livestock and meat is a large and expanding industry, its growth is just barely keeping up with the increase in population. Skins have entered the export trade, however, their value varying from 7 to 17 percent of the total value

of exports from 1906 to 1919. Their relative importance has declined to 2 or 3 percent of the total in the last two decades.

There is no continuous record of cattle population, and such estimates as are available are highly contradictory. The estimates given in table 37 indicate the growth of the industry in a general way. The peak in cattle numbers came in 1921, probably as a result of the high prices of 1918 and 1919.

Cattle make up a good part of the wealth of Colombia; the total estimated value of the cattle population in 1938 was 281 million pesos (160 million dollars). The value of the 1938 slaughter was 68 million pesos (39 million dollars), as compared with 89 million pesos (51 million dollars), the value of 1938 coffee exports.

Cattle furnish meat to supplement the diet of Colombians in many sections of the country, particularly in Antioquia. They are used for work animals in some sections, especially at the lower elevations. In the important producing Department of Bolívar, cattle raising affords a living for most of the population.

TABLE 37.—*Estimated cattle population in Colombia, 1893-1938*

| Year | Cattle | Year | Cattle |
|------|------------------|------|------------------|
| | <i>Thousands</i> | | <i>Thousands</i> |
| 1898 | 2,800 | 1926 | 8,500 |
| 1896 | 3,465 | 1927 | 8,727 |
| 1904 | 4,000 | 1930 | 7,343 |
| 1915 | 3,035 | 1931 | 8,000 |
| 1916 | 4,832 | 1932 | 7,592 |
| 1921 | 9,428 | 1934 | 7,972 |
| 1923 | 6,500 | 1935 | 8,827 |
| 1924 | 6,391 | 1937 | 7,592 |
| 1925 | 6,476 | 1938 | 8,112 |

DESCRIPTION OF THE INDUSTRY

LOCATION AND CHARACTERISTICS OF GRAZING AREAS

Cattle are raised in all parts of Colombia, grazing at present occupying about 65 million acres, or 23 percent of the total land area. More than half of the grazing area is concentrated in the Department of Bolívar. This Department had 1,756,000 of the 8,112,000 cattle in 1938. It is a part of the Atlantic coast cattle "empire," which stretches along the coast in a strip from 40 to 75 miles wide.

Back of the coast region are the *sabanas* of the Sinú, Magdalena, and Atrato Valleys, where many cattle are grazed. The Departments of Magdalena and Boyacá have over 700,000 head each. The Cauca Valley is also a good grazing land, the Department of Valle having over 500,000 head.

Farther up the slopes of the mountains in the coffee country of Antioquia are the black-eared white cattle, and on the Sabana de Bogotá, in the colder regions, are the best cattle in the country. The eastern plains, or *grasslands*, have only about 300,000 head of cattle, although this could be the largest cattle-grazing region of the country if the transportation problem could be solved. Most of the cattle in this region are now in Boyacá and Meta Intendencia (fig. 35 and table 38).

In the great coastal cattle region the altitude varies from sea level up to 200 feet and the rainfall averages 40 inches a year. The climate is tropical, with little variation from month to month. Back in the valleys the rainfall is heavier, ranging from 40 to 60 inches,

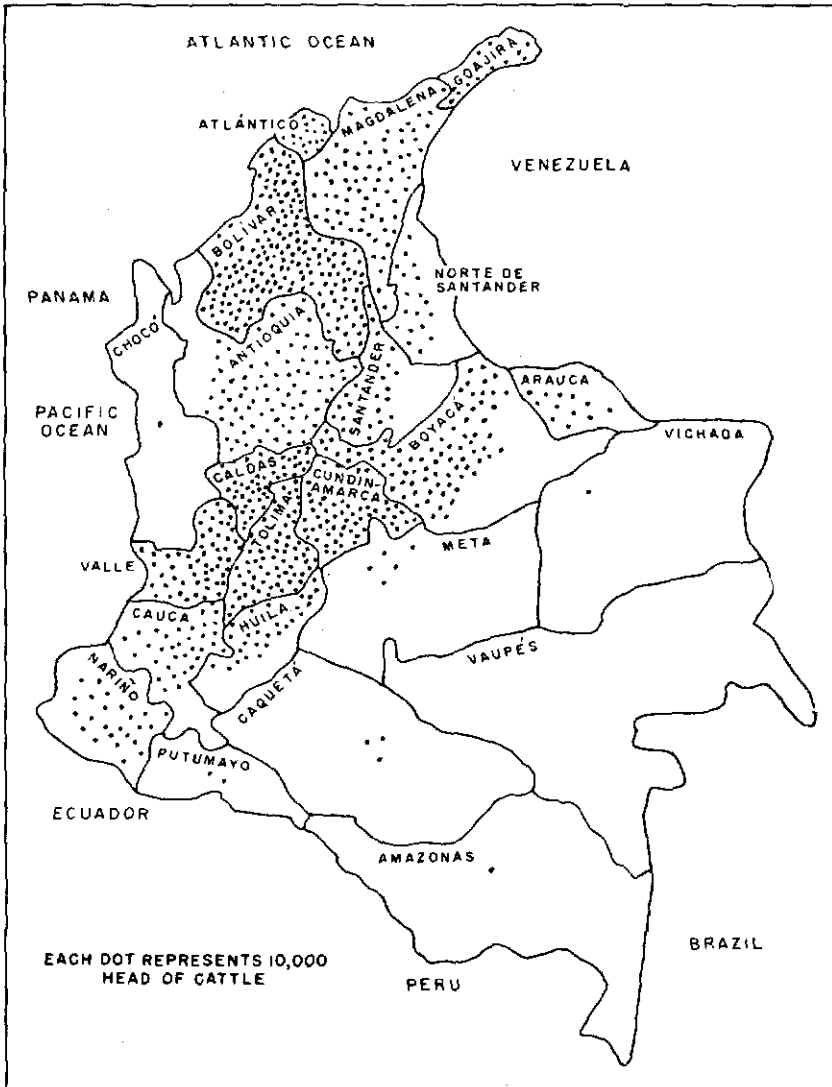


FIGURE 35.—Cattle population of Colombia, 1938.

and the elevation is higher, from 200 to 500 feet above sea level. The eastern plains region is hot and low. Temperatures in the coffee country are milder and the rainfall well distributed. The Sabana de Bogotá is cool and well-adapted to raising a good grade of imported cattle.

TABLE 38.—Cattle population and slaughter in Colombia, 1933

| Administrative divisions | Population | Value | Slaughter |
|-------------------------------|---------------|---------------|---------------|
| | <i>Number</i> | <i>Pesos</i> | <i>Number</i> |
| Department: | | | |
| Antioquia..... | 824, 181 | 28, 566, 110 | 138, 682 |
| Atlántico..... | 174, 520 | 6, 048, 860 | 38, 990 |
| Bolívar..... | 1, 756, 095 | 60, 866, 250 | 64, 954 |
| Boyacá..... | 769, 850 | 26, 683, 000 | 43, 139 |
| Caldas..... | 467, 509 | 16, 203, 860 | 109, 737 |
| Cauca..... | 340, 527 | 11, 802, 668 | 30, 061 |
| Cundinamarca..... | 548, 820 | 19, 022, 100 | 142, 265 |
| Huila..... | 264, 947 | 9, 183, 060 | 35, 645 |
| Magdalena..... | 758, 888 | 26, 303, 050 | 38, 799 |
| Nariño..... | 238, 302 | 8, 259, 540 | 18, 534 |
| Norte de Santander..... | 180, 432 | 6, 253, 770 | 47, 486 |
| Santander..... | 224, 181 | 7, 770, 110 | 89, 209 |
| Tolima..... | 654, 503 | 22, 685, 070 | 87, 704 |
| Valle..... | 559, 972 | 19, 408, 620 | 90, 638 |
| Intendencia: | | | |
| Amazonas..... | 7, 733 | 268, 020 | 501 |
| Chocó..... | 7, 510 | 260, 290 | 1, 900 |
| Meta..... | 45, 947 | 1, 522, 520 | 6, 252 |
| San Andrés y Providencia..... | 995 | 34, 480 | 267 |
| Comisaría: | | | |
| Arauca..... | 115, 799 | 4, 013, 590 | 1, 694 |
| Caquetá..... | 25, 091 | 869, 650 | 3, 176 |
| Guajira..... | 117, 017 | 4, 065, 800 | |
| Putumayo..... | 16, 469 | 570, 810 | 671 |
| Vaupés..... | 8, 102 | 280, 810 | 11 |
| Vichada..... | 4, 530 | 157, 000 | 229 |
| Total..... | 8, 111, 920 | 281, 089, 030 | 990, 574 |

Ministerio de la Economía Nacional de Colombia (12).

Cattle ranches are small as compared with those in Argentina and the western part of the United States. The land in the Bolívar area is divided into many small ranches. Only one producer has over 60,000 head, one other 25,000, and only six in all own 5,000 or more. Most producers have 100 head or less. About half the area of this Department is in Government lands (*baldíos*) which are used for grazing.

Large tracts of Government land throughout other parts of the country are used for grazing, especially in Boyacá and the Intendencia of Meta. Some of this land may be rented for grazing purposes at 20 cents an acre a year. Other cattle lands may be rented for about \$1.20 an acre a year, and pasturage at \$1 a month a head. The average value of the land is \$14 an acre. Sabana land around Bogotá has been valued at \$120 an acre, and pasturage is rented at \$3 a head a year, 2½ acres feeding one animal. Land in Meta Intendencia may be had for from 80 cents to \$8 an acre.

BREEDS OF CATTLE

The dominant breed of cattle is the criollo, or native—descendants of the early colonial stock. They resemble the breed formerly found in the Southern States and Mexico. The type of animal varies from one section of the country to another. Around Cartagena the cattle are varicolored, long-horned, small, and slow-maturing. Prime beef steers weigh from 900 to 1,000 pounds at 4 or 5 years of age. Bolívar cattle are of the Andaluz type, are very tame, and are used as yoke oxen. Farther back from the coast in the higher elevations is the criollo breed called the black-eared white cattle (fig. 36). They are highly resistant to ticks, and their white hair minimizes heat absorption from the sun. It is thought that this breed may have been

brought into Colombia from England, where a similar breed, called Park cattle, is raised. Another native breed well-adapted to conditions in Colombia is black-skinned, sorrel-haired, and hornless.

Around Bogotá, where the climate is cool, it was possible to import good breeding stock from abroad and develop a good breed of cattle for both beef and milk production. The best cattle in Colombia are raised in the highlands of Cundinamarca, Boyacá, Nariño, and Huila, where they receive good care and are relatively free from diseases and pests. The cattle on the high elevations—páramos cattle—are very poor in quality—rickety and hairy because of the cold weather and poor pasture.

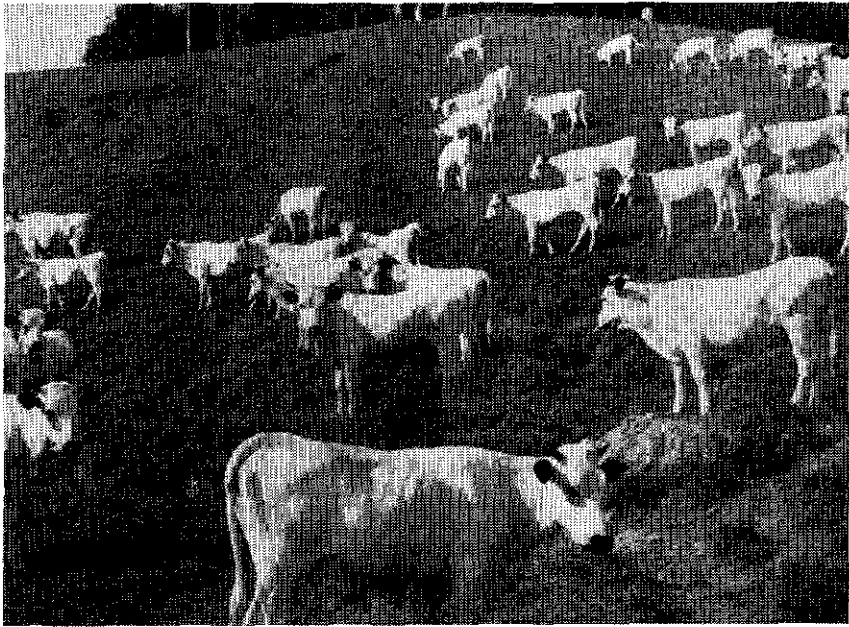


FIGURE 36.—Yearlings of the black-eared white breed at the Government experiment station at Nus, Department of Antioquia.

Very few breeding stock have been imported. The first blooded bull—a shorthorn—was brought into Colombia by an American consul in 1849. From 1860 through 1925 fewer than 200 blooded bulls and 100 cows were imported.

PESTS AND DISEASES

The pests and diseases to which the cattle of Colombia are subject are serious—the mortality among calves being especially high, about 20 percent of the total number. Ticks and Texas fever are common and in the hot coast and sabana country take a heavy toll. Other common diseases are blackleg (variously called carbón, carbón sintomático, and pata negra), and a horn disease called herequera de los cachos. The tick is widespread throughout most areas, and tabanid flies are prevalent, especially in the coast regions. Mucha is another pest of the Tropics, as well as the nuche (*Dermatobia*

hominis).¹³ The wounds caused by the latter provide breeding places for the screwworm (*Cochliomyia macellaria*), besides ruining the hide.

Experiment stations have been established, notably the one at Nus, and laws put on the statute books looking toward the control of these pests and diseases. Enforcement of the laws is lax, however, and little has been accomplished toward control.

CARE AND FEEDING

Cattle in most parts of Colombia receive very little care. They are not housed and are herded at night only occasionally. Native labor is not trained to care for them, and on the plains and in the coast regions especially the care is crude and at times brutal.

At the lower elevations, the imported stock have been cared for in the same manner as the native breeds and usually have not been able to survive such treatment. They are much more subject to the pests and diseases prevalent there than are the native breeds. Practically no effort is made by private owners to improve their stock, although crossing the imported Zebu with the native criollo foundation stock promises to produce a sturdy breed. Fair results have also been secured with Devon, Shorthorn, Holstein, Durham, Hereford, and Norman.

There is very little feeding; cattle are allowed to run at large to find food and water where they can. A plentiful supply of native grasses is available for grazing, particularly in the coastal plains, interior valleys, and the eastern plains. Pasturage probably could be found for 100 million head of cattle. Plants of high carbohydrate content, such as Pará grass and guinea grass, are available, especially in Antioquia, but leguminous pasturage is rare. Some alfalfa is grown around Cali.

There are planted pastures in the coast regions and the upper Sinú, as well as native Pará grass and wildrice, which grows in the swamps. Some prairie grass has been planted here and some guinea grass in the more rolling sections. The pastures in the sabana country are not fenced and are all in their natural state. Few poisonous weeds are found in the pastures.

In the important Department of Bolívar, the Sinú Plateau cattle region is in Pará grass pasturage and the plains are in guinea grass and many other native grasses. Cattle migrate to the ravines and streams in the dry season and return to the plateau when the rains start, there being few fences in this area.

The Department of Magdalena has ample pasturage. The best sections for grazing are in the Ariguaní River district and in the territory between that and the César River. Natural pastures are plentiful in the lowlands and artificial pastures at higher altitudes. Part of the region around these rivers, known as playones (beaches), is subject to annual overflow and is well supplied with water. About two-thirds of the Goajira Peninsula is covered with natural pasture, described as "black wheat," and the remaining third is planted to guinea grass—originally by the Spaniards.

¹³ BLACK, W. H. THE LIVESTOCK INDUSTRY IN VENEZUELA. *Foreign Agr.* 3: 525-538, illus. [Processed.] See pp. 533-534.

The Sabana de Bogatá in the highland region is largely in the Department of Cundinamarca, extending over into Boyacá. The common pastures there are composed of native grasses and some wild legumes. Some alfalfa is planted. Planted pastures in Cundinamarca include over 732,000 acres, and natural pastures 831,000 acres.

Very little natural pasture is available in the Departments of Cauca and Valle. Cattle are grazed on yaraguá, a native pasture grass, near Villavicencio in Meta Intendencia. Here, as well as in most of the eastern llanos, the cattle are of very poor grade.

It is estimated that 1 acre of planted grasses in Colombia will feed one animal but that it requires 4 to 7 acres of sabana land. Cattle ready for market vary in weight from 880 pounds in the hot regions to 1,025 pounds on the plateaus. It takes 4 to 5 years to produce these cattle, and they yield only 450 to 550 pounds of dressed



FIG. 37.—Pens at the Medellín livestock market.

beef. In Argentina, on the other hand, steers averaging 1,500 pounds and dressing 750 pounds of beef can be grown in 2½ years.

MARKETING

The general method of selling cattle, as well as other livestock, is at the local stock fairs, which are held weekly or monthly in the towns and villages. Cattle are driven to the towns (rarely taken by truck), where they are placed in large outdoor pens (fig. 37).

There is considerable movement of cattle between Departments, but little exportation of meat or cattle from the country. All the cattle produced in the Department of Cundinamarca are consumed locally, largely in the Bogotá market. Cattle from the eastern llanos find almost their only market in the Bogotá region. They must be driven over the mountain ranges from the plains; and when they reach market, they are usually nothing but skin and bones and scarcely bring enough to pay for the long and tedious trip.

Cattle raised in Cauca and Valle are consumed by coffee workers on the plantations, although the per capita consumption in this area

is only about 20 pounds of meat a year, as compared with about 60 pounds for the entire country. (Meat consumption in Argentina averages 308 pounds per capita.)

The center of the cattle industry in the Department of Bolívar is at Montería, on the Sinú River. The market for the product of this Department is in the interior, chiefly at Medellín. Cattle move from Bolívar and Boyacá to Santander, and from Bolívar to Santander del Norte.

In the Department of Magdalena, where stock raising is second only to the banana industry, the local markets absorb the total production of both beef and milk, regardless of quality.

THE MEAT INDUSTRY

There is very little refrigeration in Colombia, except in a few large cities, and fresh meat must be consumed shortly after butchering. A good deal of the beef is dried or salt-cured to preserve it for future use. In the Cartagena district along the coast, strips of meat are cured by being dipped into ocean water, and in the interior regions beef is salted and sun-dried to make jerked beef.

The packing plant located at Coveñas near Cartagena was the only modern plant of any size in Colombia. It never handled a very large volume of meat, and operations were suspended several years ago.

Cattle slaughter (including that of imported cattle) has been about 1 million head a year (table 39).

TABLE 39.—Cattle slaughter in Colombia, 1928-38

| Year | Slaughter | Year | Slaughter |
|-----------|------------------|-----------|------------------|
| | <i>Thousands</i> | | <i>Thousands</i> |
| 1928..... | 874 | 1934..... | 1,025 |
| 1929..... | 873 | 1935..... | 1,033 |
| 1930..... | 818 | 1936..... | 1,042 |
| 1931..... | 789 | 1937..... | 1,011 |
| 1932..... | 887 | 1938..... | 991 |
| 1933..... | 960 | | |

Of the total 991,000 head slaughtered in 1938, 24,000, or 2 percent, were imported. Cows made up about 40 percent of the total number slaughtered. This represented a reduction from previous years in the percentage of cows slaughtered; but, in view of the desire to expand production, it is still a high proportion of the breeding stock.

DAIRYING

Dairying has never been developed to any extent in Colombia, and the so-called dual type of cattle there would not compare favorably with those in the United States. The best breeds for milking are the Holstein, Friesian, and Norman. On the high sabanas around the markets of Bogotá and Medellín, cows produce, on an average, 4 quarts of milk a day, but the average for the country is much lower, running from 1 to 2 quarts a day. Cows are usually milked only once a day at 5 or 6 o'clock in the morning. In the dry season there is as much as 6 inches of dust in most milking corrals, and in the rainy season up to a foot of mud.

Dairy products are produced and marketed in a primitive fashion. There is no butter produced or used except in the large cities, and very little there. In Bogotá it is possible to get a good grade of fresh milk, but in most sections milk is still delivered in large cans carried on the backs of donkeys. Some cheese is produced for local consumption, but it does not compare favorably with the product found in United States markets. Some evaporated milk and a little dried milk is imported into the country, largely for the use of foreigners residing in the cities. Imports represent less than 1 percent of the total milk consumption.

A new organization in Bogotá, La Industria Colombiana de Leches, is being organized for the purpose of manufacturing milk products. It is hoped that this new organization will be able to produce sufficient milk products to supply local requirements and replace the supply now imported.¹⁴

The total production of milk in 1938 was 1.1 billion quarts, over one-third of which was produced by the herds on the Sabana de Bogotá. This would indicate an average per capita consumption, in one form or another, of 130 quarts a year. This compares with 390 quarts in the United States.

CONSUMPTION AND TRADE

All but about 2,000 cattle of almost a million slaughtered in a year are for domestic use. The total live weight of the slaughter in 1938 was 766 million pounds, which dressed 427 million pounds of beef. It has been necessary to import from 10 to 20 million pounds (live weight) from Venezuela to supply the domestic market. This represents 1 percent of the total requirements for beef.

Meat is considered a luxury in most regions, and the quantity consumed varies with the price of coffee, the chief income-producing crop. Another factor limiting meat consumption is the slaughter tax and, in some Departments, a consumption tax.

Colombia was a net exporter of cattle during the first part of the century, but imports are now larger than exports. From 1916 to 1924, exports varied between 25,000 and 50,000 head, the major part going to Cuba and the remainder to Panama. Since 1914, however, exports of cattle have declined more or less steadily, until in 1939 only 1,000 head, valued at 56,000 pesos, left the country. Most of the live cattle now exported go to Panama, largely from the Department of Bolívar. With the present lack of transportation facilities within the country, it would be almost impossible for cattle from the interior regions to reach the seaports. Good-quality cattle from Antioquia or the Sabana de Bogotá therefore do not reach the export market. The grade shipped from the coast country is classified as fair to average in quality, similar to the Segundo Grado Colonial Congelada of Argentina. There is very little foreign trade in beef products on either the export or the import side.

The price of cattle has been increasing steadily during the past few years, that of fat cattle in Medellín from 29.97 pesos per head in 1933 to 92.23 pesos in 1938. There is a wide variation in price

¹⁴ U. S. DEPARTMENT OF AGRICULTURE, OFFICE OF FOREIGN AGRICULTURAL RELATIONS. COLOMBIA'S CAPITAL ANNOUNCES PLAN TO REDUCE MILK PRODUCTS IMPORTS. Foreign Crops and Markets 43: 287.

as between different sections of the country. The average price of fat cattle for the entire country was 69.97 pesos in 1937, as compared with 91.11 pesos on the Medellín market. Lower grades of cattle sell for much less than this top grade, their price sometimes being only one-fourth that for the higher grades. The variations in price may reflect differences in the weights of the animals since the quotations are not on a per-pound basis. The average price of all domestic cattle slaughtered in 1938 was 8.3 centavos a pound on the hoof.

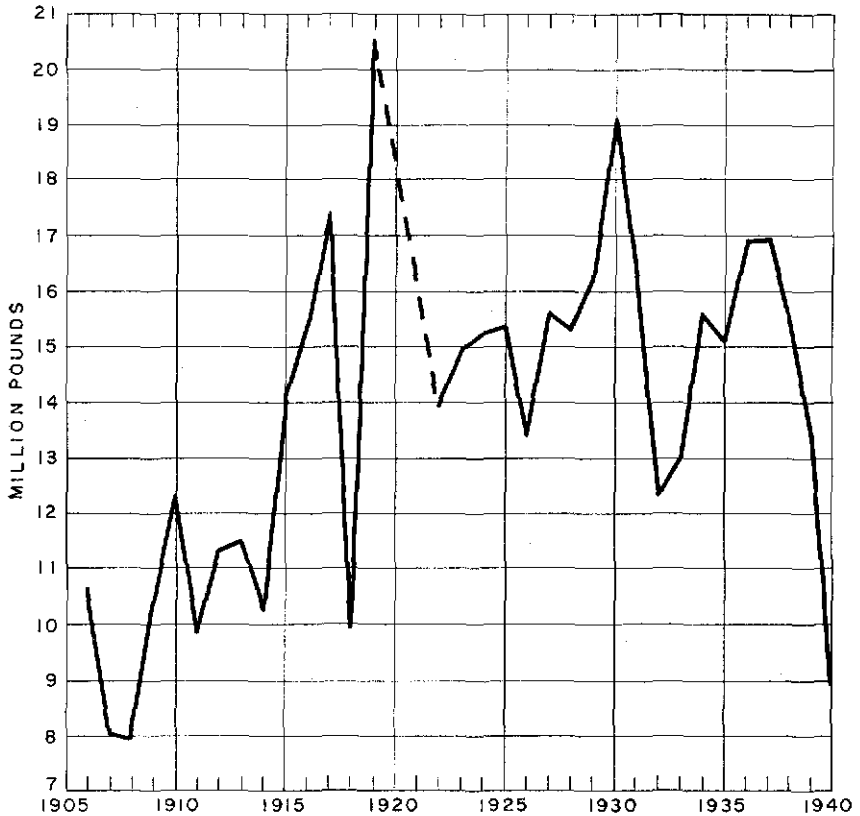


FIGURE 38.—Exports of cattle hides from Colombia, 1906-40.

HIDES AND SKINS

Of much more importance than cattle or beef from a trade standpoint have been cattle hides and skins. Although the relative importance of cattle-hide exports has been declining in recent years (appendix table 57), the absolute quantity shipped during the past two decades has exceeded the exports of the preceding 20 years. The peak of shipments came in 1919, when 20.6 million pounds were exported. Quantities of hides were stored in the interior during 1918, and part of the large shipments in 1919 was from 1918 production that had not been marketed. The high prices of 1919 brought them onto the market. The trend of exports since 1906 is shown in figure 38.

Exports of cattle hides ranked third in importance among total exports from 1906 through 1919. The United States was the largest market, taking in some years 90 percent of the total. During the twenties, petroleum and banana exports represented a larger proportion of the total than cattle hides, and during this period the European market became of increasing importance. The United States was still taking about two-thirds of the total through 1925, but from 1927 to 1930, it took only one-fourth to one-third and during the 1930's from one-sixth to one-seventh. By 1939, shipments to the United States amounted to only 537,000 pounds of a total export of 13 million pounds. Practically all the rest went to European markets. Germany was the chief outlet, taking over half the total. Belgium was second in importance.

Most Colombian hides and skins are exported, and they hold an important place in total exports. Colombia is not a major source of supply for cattle hides, however, and has not supplied a large part of United States imports of these products.

There are several local tanneries that utilize part of the hides and skins from the cattle industry. The domestic market for leather products is limited, since most of the population either go barefoot or wear fiber slippers. The local tanneries utilize the inferior hides, most of the best quality going into export.

Hides consumed locally are dried or dry-salted; the ones for export are usually wet-salted. The better quality product is usually sold by weight, whereas the inferior grades are sold by the piece. The tanners or exporters usually finance the collection of the hides.

Many tanning agents are available in Colombia, divi-divi being the most important. It is found in the dry section of the Goajira Peninsula and on the Atlantic coast. Other tanning agents include mangrove bark and algarrobbillo. Some are also found in the cold lands of the Departments of Cundinamarca, Santander, and Cauca.

Imports of hides and skins and manufactured leather have been made in varying quantities. Imports were valued at from a third to half a million dollars before the World War; during the 1920's they increased to between 1.6 and 3.6 million dollars; and recently they have again declined considerably.

Most imports of hides, as well as of manufactured leather products, come from the United States. Germany and the Netherlands together formerly supplied about 40 percent.

AIDS TO THE INDUSTRY

The Government has for some time been interested in improving the breeds of cattle. A law of 1916 authorized the Government to reimburse the importer of pedigreed cattle for one-third of the cost and transportation expenses of breeding stock if the grant did not exceed \$300 for each animal. The Department of Antioquia authorized free railway transportation for pedigreed stock, and later the Department of Caldas authorized payment of 60 percent of the cost of pedigreed bulls and 50 percent of the cost of pedigreed cows if the subsidy did not exceed \$500. Other Departments have special provisions for encouraging improvement in breeds.

Three experiment stations for improvement of cattle were established in 1935, one in Montería, one in San José del Nus, and one in

Valledupar. The first of these stations is specializing in the development of a hornless cattle—(moruna sin cuernos); the station at Nus is specializing in the black-eared white cattle; and that at Valledupar is working with a native horned breed found in the Department of Magdalena. Later work was started at Orocué to see what could be done toward improving the cattle of the eastern plains (9). Exportation of breeding stock of the black-eared white and Romo-sinuano breeds was prohibited by a decree of 1940.

The national cattle loan fund was established by the Government in 1939 to make loans for the raising and breeding of cattle. The fund, consisting of 5 million pesos (2.8 million dollars), is to have a life of 40 years, is to be administered by a council, and its operations are to be exempt from taxation. It is authorized to make mortgage loans for amortization over a 20-year period, to make and guarantee 5-year loans by chattel mortgages on livestock and livestock products, and to make guaranteed loans for the development and expansion of the cattle-breeding industry.

In December 1939 an additional 6 million pesos of capital was authorized for the Agricultural, Industrial, and Mining Credit Bank, and the Agricultural Mortgage Bank was given the right to subscribe shares in the national cattle-loan fund. The Bank of the Republic was empowered to increase its loan to these agencies by 20 percent.

OTHER LIVESTOCK

HOGS

The hog-raising industry is not well developed. Most of the farms have a few hogs, which are raised for home meat and lard consumption, but there is little commercial production. Little corn is fed, the animals being allowed to root for themselves. Most of the hogs are of the razor-back type.

There are few packing plants, and very little processing is done. Most of the hogs are consumed in the region where they are produced.

It is difficult to estimate the number of hogs in the country, but the available figures show that the hog population has been fairly stable during the past 10 years. The 1938 estimate was 1.6 million head, valued at 12.9 million pesos. During that year 665,349 hogs were slaughtered. The live weight of the slaughter was 120 million pounds, as compared with 765 million pounds of cattle. Data on the distribution of hogs throughout the country are also not available, but slaughter figures for 1938 indicate that Antioquia was the largest producer, supplying 20 percent of the total (table 40).

TABLE 40.—Hog slaughter in Colombia, 1938

| Administrative division | Slaughter | Administrative division | Slaughter |
|-------------------------|-----------|----------------------------------|-----------|
| Department: | Number | Department—Continued. | Number |
| Antioquia..... | 131,719 | Nariño..... | 22,425 |
| Atlántico..... | 12,611 | Norte de Santander..... | 13,642 |
| Bolívar..... | 60,177 | Santander..... | 42,240 |
| Boyacá..... | 33,943 | Tolima..... | 43,732 |
| Caldas..... | 91,858 | Valle..... | 62,084 |
| Cauca..... | 9,854 | Total Departments..... | 651,862 |
| Cundinamarca..... | 98,693 | Intendencias and Comisarías..... | 14,347 |
| Huila..... | 15,447 | Total Colombia..... | 666,199 |
| Magdalena..... | 13,327 | | |

Hogs that are not consumed on the producing farms are taken to the open-air markets in the towns and cities for sale. The per capita consumption of hog products runs about 7 pounds a year. There is very little foreign trade in hog products. Several years ago, considerable quantities of lard and some hams and bacon were imported, largely from the United States. However, since the import tax on these items has been increased in an attempt to make the country self-sufficient, imports have fallen off drastically. Under the terms of the United States-Colombian trade agreement, the tariff on lard from the United States was reduced from 7.8 cents a pound to 3.9 cents. Only 130,000 pounds of lard were imported in 1937. In 1938 imports rose to 1.9 million pounds, and in 1939 to 15 million pounds for the first time since the 1920's. In 1940 imports fell to 9.6 million pounds. All lard imports have been from the United States.

The raising of hogs on a commercial scale depends upon the accessibility of an adequate supply of cheap corn, disease control, and facilities for industrialization and marketing of the products. The United States mission to Colombia pointed out that the region where corn production is being expanded lies in a tropical climate where damage from heat, rain, and humidity is great and where storage of the grain is extremely difficult because of weevils and other pests. The costs of production there (as indicated by the price of corn) are high, not only when compared with those in other corn-producing areas but also in the light of the alternative uses of the land.

Even if a supply of cheap corn were available near the hog-producing area, however, hog production would require the establishment of facilities for slaughtering the animals as well as for storing and transporting the products to market. Refrigeration facilities at several distributing centers would likewise be necessary. If the producing and processing industries were established to satisfy Nation-wide rather than the present regional consumption, hog production could doubtless be expanded, but it is doubtful whether the industry even if expanded could support the heavy cost of investment and transportation.

HORSES

Most of the horses of Colombia are descendants of Arabian and Berber horses imported by the Spanish conquistadors. In some places, where good-quality pasture is available, pure-bred imported horses have been crossed with the native stock in an attempt to improve the herd. The Government has been interested in developing finer animals and is encouraging the importation of fine stallions.

It is estimated that there are a million head of horses in Colombia, the average value being 41.88 pesos. The sale price for horses in the Medellín market increased from 30.52 pesos in 1933 to 63.98 pesos in 1938.

SHEEP AND GOATS

The native sheep are apparently descendants of the merino, but they are little developed in wool production, and the average annual production per head is very low. The Government is interested in developing the wool industry to provide raw material for a wool-textile industry and has established a model sheep farm in the De-

Valledupar. The first of these stations is specializing in the development of a hornless cattle—(moruna sin cuernos); the station at Nus is specializing in the black-eared white cattle; and that at Valledupar is working with a native horned breed found in the Department of Magdalena. Later work was started at Orocué to see what could be done toward improving the cattle of the eastern plains (9). Exportation of breeding stock of the black-eared white and Romo-sinuano breeds was prohibited by a decree of 1940.

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partment of Caldas to conduct experiments and give technical aid to the industry.

In 1938 it was estimated that there were about a million sheep and 600,000 goats in Colombia. The number has increased slowly during the past few years. The estimated value of the sheep was 4.6 million pesos and that of the goats 1.7 million pesos. The 1938 slaughter of sheep amounted to 107,000 head, concentrated largely in Boyacá and Cundinamarca. Norte de Santander and Boyacá accounted for 80 percent of the total slaughter of goats.

FOREIGN TRADE

COMMERCIAL POLICY

For many years Colombia has had a high-tariff policy in an effort to encourage domestic self-sufficiency. Until 1931 the tariff was the primary measure for the control of trade. In September 1931, however, Colombia left the gold standard and established exchange control by an Exchange and Export Control Board. Exchange permits were required for all imports, preference being given to essential commodities. Compensation and clearing agreements, as well as other commercial agreements, have been used further to control foreign trade.

In December 1931, after the application of exchange control in September, a law was enacted to provide penalty rates on goods from countries not extending most-favored-nation treatment to Colombia. In general, regulations have required delivery at the Central Bank at the official rate of a certain percentage of the exchange resulting from exports of certain commodities, the rest being disposed of in the free market to those having exchange permits. The exact method of control has been changed several times, one of the most important changes being that made in November 1937, when Congress authorized emergency exchange and import restrictions. The free market was made subject to Government control, although in 1938 a free exchange market was again authorized, subject to Government intervention if necessary. The President was empowered to reform all the control over foreign exchange, imports, and exports by a law of December 1939.

The system was again modified in April 1940, as a result of difficulties arising out of the war, to provide a balance in foreign trade and to stabilize exchange rates. Authority was granted to increase the power of the stabilization fund (which had been set up in 1934) to trade in notes, drafts, etc., to contract long-term and short-term loans, and to purchase and sell sight and forward exchange. A schedule of priorities was established whereby imports were classified into four groups, with the Exchange Control Office empowered to grant preferential exchange for merchandise in Class I and determine amounts of exchange to be granted for the other three groups.

Class I merchandise covers articles listed as necessities and includes wheat, milk, oats, barley, agricultural implements, machinery, tires and tubes, etc. The exchange ratio applying to Class I merchandise is 1.75 pesos to the dollar; that applying to Class II, 1.80 pesos; that to Class III, 1.87 pesos; and that to Class IV, 1.95 pesos.

The Exchange Office provides exchange for Class I imports—necessary items and Government imports—and for resident, Government, and other remittances. Any additional available exchange is turned over to the stabilization fund, which makes it available for Class II, III, and IV imports.¹⁵

The tariff rates on imports have been high for years and were particularly so during the World War. From time to time they have been changed, either up or down according to the conditions existing, but they have continued high. Until 1936 the tariff was essentially a single-column one, but since the signing of the United States-Colombia trade agreement, it has been based on a multiple-column tariff policy determined by trade balances. The maximum rate applies to countries that buy very little from Colombia or obstruct the entry of Colombian products; the basic or intermediate rate is for those who purchase a substantial quantity of goods from Colombia; and the minimum rate is for those that have unconditional most-favored-nation agreements. Most duties are assessed on weight of merchandise. Motor vehicles, bicycles, jewelry, gold- and silver-plated articles, and precious stones are subject to ad valorem rates.

Formal compensation or clearing agreements were made with several countries in the decade of the 1930's, including Germany, Italy, Czechoslovakia, Denmark, and Norway, as well as informal compensation arrangements with several other countries. The agreement with Germany resulted in an adverse trade balance for Colombia. A new agreement was made on June 1, 1937, providing for bilateral balancing of trade between the two countries, but it was not entirely successful.

By a 1940 decree the Government may restrict the importation of raw cotton and cotton yarn, wool and wool yarn, vegetable oils, edible animal fats, cacao and cacao derivatives, wheat and edible derivatives, rice and commercial derivatives, white sugar and unrefined brown sugar, vegetables and garden produce, and fresh fruits cultivable in Colombia.

TRADE BALANCES

Export values have exceeded import values in most years during the present century, especially during the 1930's, when the export balance was exceptionally high (fig. 39). The export figures include gold, which is as important in the economy of Colombia as exports of merchandise. Before 1937, import figures were quoted on an f. o. b. basis, and since that time they have been on a c. i. f. basis, so that the apparent value of imports in later years tends to be increased.

The balance of payments has been influenced from time to time by foreign loans and investments, as well as by receipts of indemnity from the United States for Panama. Foreign loans were high from 1926 through 1929, reaching a peak of 70 million dollars in 1928. Internal purchasing power increased and the demand for foreign goods rose. Loans and investments declined sharply in 1930 and stopped completely during the depression years. The excess of exports (including gold) over imports during the 1930's was not sufficient to service the external debt, and further exchange controls were

¹⁵ PAN AMERICAN UNION. ECONOMIC WARTIME MEASURES IN BRAZIL AND COLOMBIA. Com. Pan Amer. 9: [267]-276. September 1940. [Mimeographed.]

made necessary. Foreign investments in 1939 amounted to 345 million dollars, 80 percent of which was held by Americans. In addition, foreign residents are said to control commercial and industrial enterprises that have a capital of 28 million dollars.

Since the war started, there has been a decline in the value of both exports and imports. Between 1939 and 1940 import values declined 19.6 percent and export values 6.2 percent. The decline in the exports other than gold was greater, however, being 8.9 percent from 1939 to 1940.

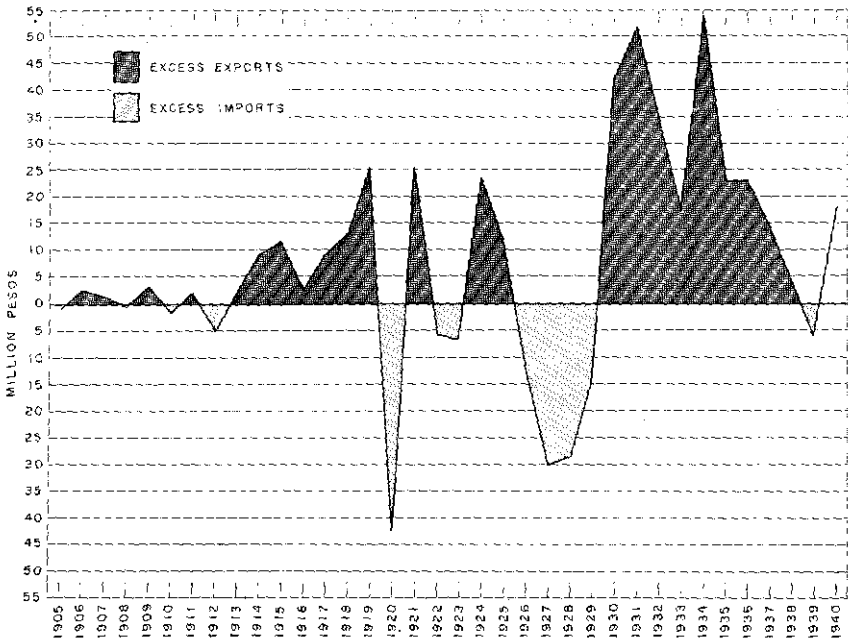


FIGURE 39.—Colombian balance of trade (including gold), 1905-40.

EXPORTS

The general trend of exports has been upward for the past 40 years, with downward breaks in the trend of export values during the post-war depression and the early 1930's. The dollar and peso values moved together closely until 1931, when the peso left gold. The peso value increased sharply and stayed above the dollar value during the 1930's, reflecting exchange fluctuations.

No index of export quantities is available. To obtain a rough measure of quantity exports, an index of export prices was constructed and the peso value deflated by this index.¹⁶ As expected, the quantity figures did not fluctuate as much as the value data. During the post-war depression, quantities exported not only did not decline but continued their upward trend. While values began a sharp decline in 1929 that continued to 1932-33, the quantity exported continued to rise through 1930 and the following drop was not as great as that in value.

¹⁶ See appendix table 58 for description of index.

During the 1930's, the trend was upward, in 2 of the years surpassing the previous high point of 1930. Figure 40, showing the peso and dollar export values, as well as the calculated quantity, indicates the trends in exports and reveals graphically the contrasts in the three measures.

Exports from Colombia are largely agricultural, although petroleum has reached second place in value in recent years and, together with gold, makes up a sizable portion of the total. The major export products, coffee, gold, bananas, and hides and skins, made up from 70 to 87 percent of the total export value in early years and, with the addition of petroleum, have made up from 95 to 98 percent of the total lately (appendix table 59). Figure 41 shows the major exports in

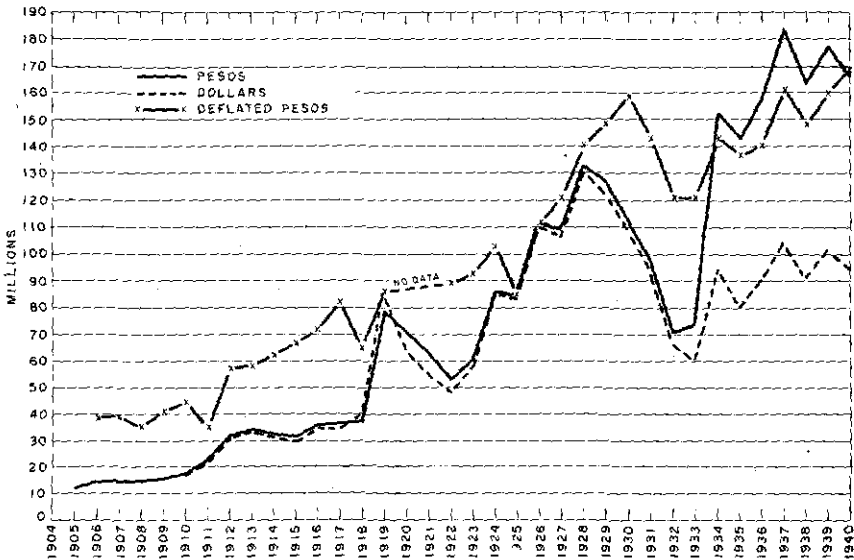


FIGURE 40.—Total exports from Colombia, 1905-40.

percentage of total value from 1906 to date. Coffee is by far the most important single commodity, although its relative importance has declined. From 1906 to 1924 the general trend was upward, rising from slightly over 40 percent of the total value to almost 80 percent of the total. Since then its relative importance has been declining, and in 1940 its value was down to less than half the total.

From 1906 through 1916 and during the 1930's, gold exports were quite important, from 15 to 20 percent of the total value. Petroleum exports first began in 1926, and the very next year they jumped into second place, accounting for 20 percent of the total value. Petroleum and gold together have since represented from 35 to 40 percent of all exports.

Exports of hides and skins used to be relatively more important than banana exports, but in the past 20 years these two have changed places, and hide and skin exports have declined from 10 percent of the total to about 2 percent. Appendix table 57 shows the percentage distribution of other products important in the export picture. Plat-

inum, an important item in early years, is still exported, but its relative importance is much less. Tobacco, rubber, straw hats, and tagua together used to account for from 10 to 12 percent of all exports, but recently they have represented less than 1 percent of the total, and cacao, formerly an export, is now on the import list.

The importance of the United States market for Colombian exports is strikingly apparent (fig. 42). The United States took about 80 percent of all exports from 1916 through 1931, but during the 1930's the percentage declined steadily to 53 in 1938. Before the World War the United Kingdom ranked second, taking approximately 15 percent, but now it has about disappeared from the market, being

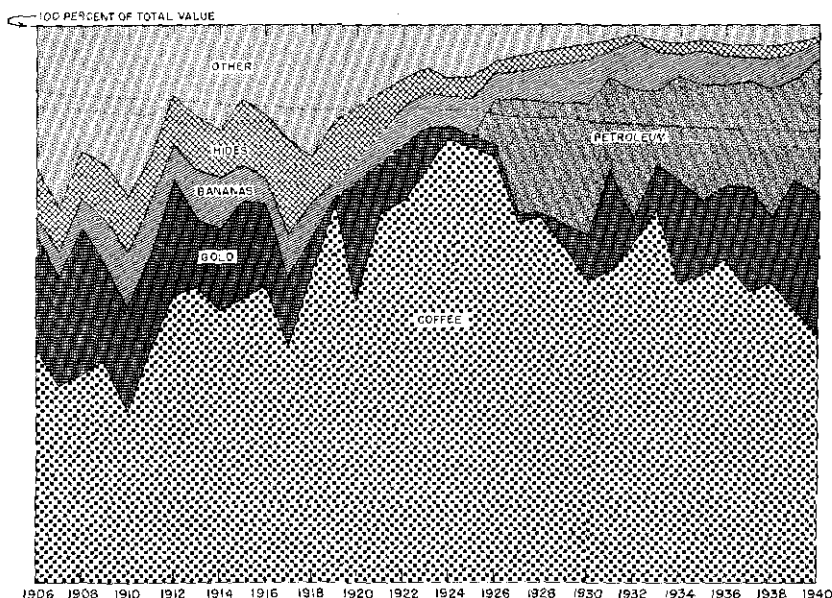


FIGURE 41.— Exports of major products from Columbia as percentage of total exports, 1906-40. (Data are not separately classified for 1920 and 1921.)

replaced by France and Canada, which together have accounted for about 15 percent of exports in recent years. Germany showed a remarkable advance percentagewise from 1935 through 1938, taking almost 17 percent of total exports in 1936, after having taken only 1 to 2 percent during the 1920's. Beginning in 1934 the Netherlands West Indies began to take from 10 to 12 percent of all exports. The only other important market has been the Netherlands, which took from 2 to 5 percent of the total during the 1920's (appendix table 60).

Exports to the Netherlands West Indies have been mostly petroleum, probably reflecting a diversion from the United States as a result of the import excise tax on petroleum levied by the United States in 1932, since most of it went to the United States prior to that time. Much of the oil going to the Netherlands West Indies for refining probably is in turn shipped to the United States, since one of the large oil companies in Colombia is a subsidiary of a Canadian

company, which is in turn a subsidiary of a United States company having refineries in the Netherlands West Indies.

Practically all the gold and platinum is taken by the United States. Details of trade in agricultural products are given in the commodity sections.

IMPORTS

The general trend of imports has been rising slowly since 1906, although the business-cycle changes are reflected quite closely in the import statistics of Colombia. There was a sharp increase in 1919-20 and a severe drop in 1921, a steady rise to a peak in 1928 and a pre-

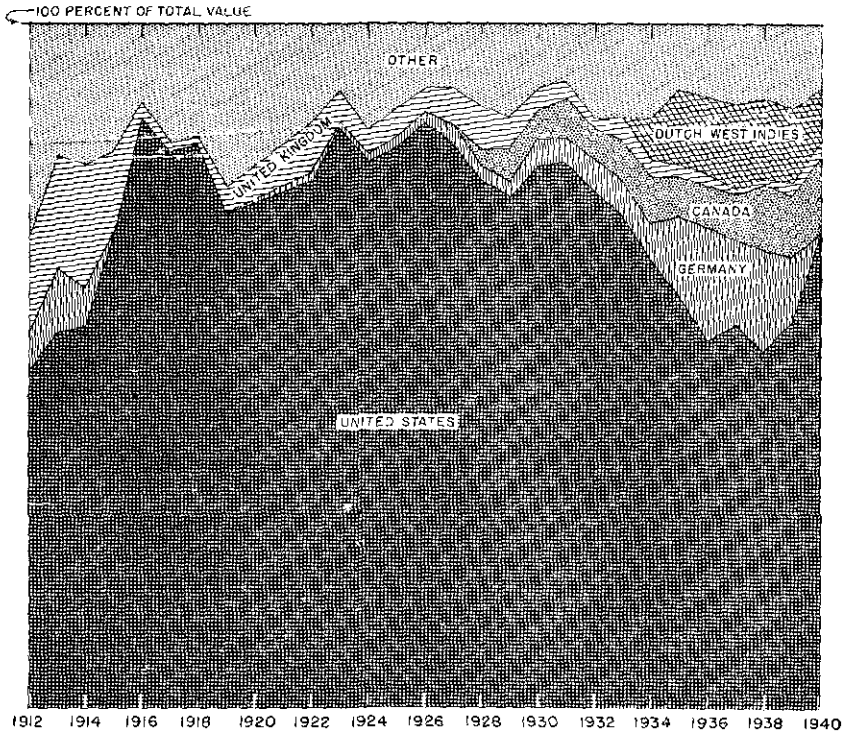


FIGURE 42.—Total exports from Colombia, by value and country of destination, as percentages of total exports, 1912-40. (Data are not separately classified for 1920 and 1921.)

cipitous decline through the early 1930's (fig. 43). The dollar and peso values moved along together until 1934, when the peso value rose almost twice as high as the dollar value to reflect the change in exchange rates.

An index of import quantity is not available, and an attempt was made to construct an index that could be used to deflate the value figures. Since the United States has been the major supplier of Colombian imports, United States wholesale-price indexes of the major import groups were used as a base, weighted according to the importance of the group in the import trade (appendix table 58).

This method involves many assumptions that may or may not be accurate. For example, it is assumed that the imports of items making up the group total are in the same proportion as they are weighted in the United States wholesale-price index for that group. However, despite the weakness of the measure, it is possible to use the deflated dollar value of imports as a rough approximation of the trend in import quantities. The new series is plotted with the value data on figure 43. As was to be expected, it does not rise as drastically in 1920 as the value figures, and from 1933 on, it is relatively higher than the dollar values.

Imports vary greatly and include a wide range of manufactured articles. (See appendix table 61.) Manufactured products have

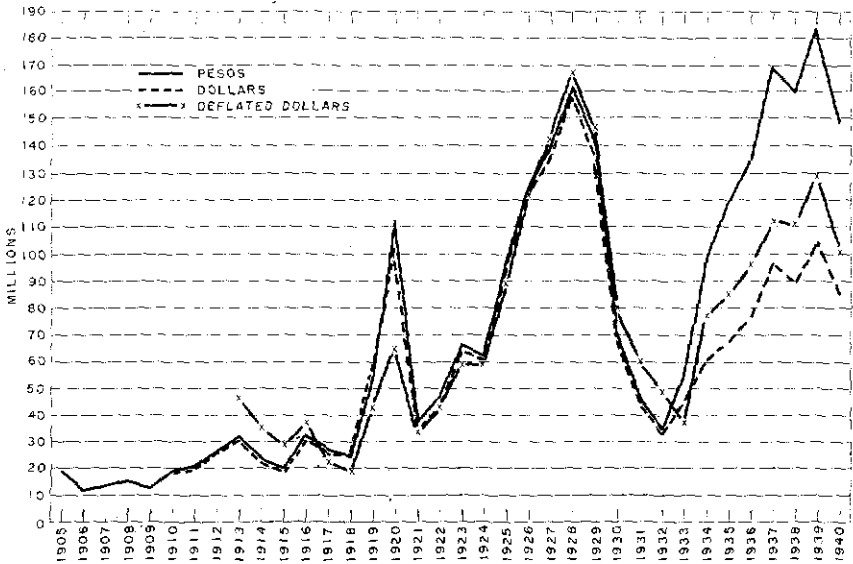


FIGURE 43.—Total imports into Colombia, 1905-40.

constituted an increasing proportion of total imports, rising from 87 percent of the total in 1929 to over 90 percent the past few years. Imports of agricultural and animal products in proportion to the total declined from 12 percent in 1929 to 9 percent in 1940 (table 41).

TABLE 41.—Colombian imports of major groups of products as percentages of total imports, 1929-40

| Type of product | 1929 | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| Agricultural..... | 8.5 | 5.5 | 4.6 | 5.9 | 6.1 | 6.7 | 6.0 | 5.5 | 6.7 | 7.1 |
| Animal..... | 3.4 | .7 | .01 | .6 | .7 | 1.2 | .8 | 1.0 | 2.2 | 1.6 |
| Forest..... | 1.2 | .8 | .7 | .8 | .6 | .6 | .7 | .7 | .6 | .8 |
| Mineral..... | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 | .2 |
| Manufactured..... | 86.6 | 91.9 | 90.0 | 89.3 | 91.2 | 90.7 | 92.2 | 92.5 | 90.1 | 90.1 |

There has been a striking decline in the importance of the textile group in the total import picture (fig. 44). While it still represents

the most important single group, it has dropped from 40 to less than 20 percent of the total. Metals and metal manufactures and machinery have replaced textiles in importance, reflecting the trend toward industrialization in Colombia and the building up of small industries, especially textile mills.

The foodstuff group has had a varied course, (21), as compared with total imports, but is declining in importance. It was fairly prominent during the 1920's, when the import duties were not so high, but with the new increase in duties in 1931 it shrank in importance.

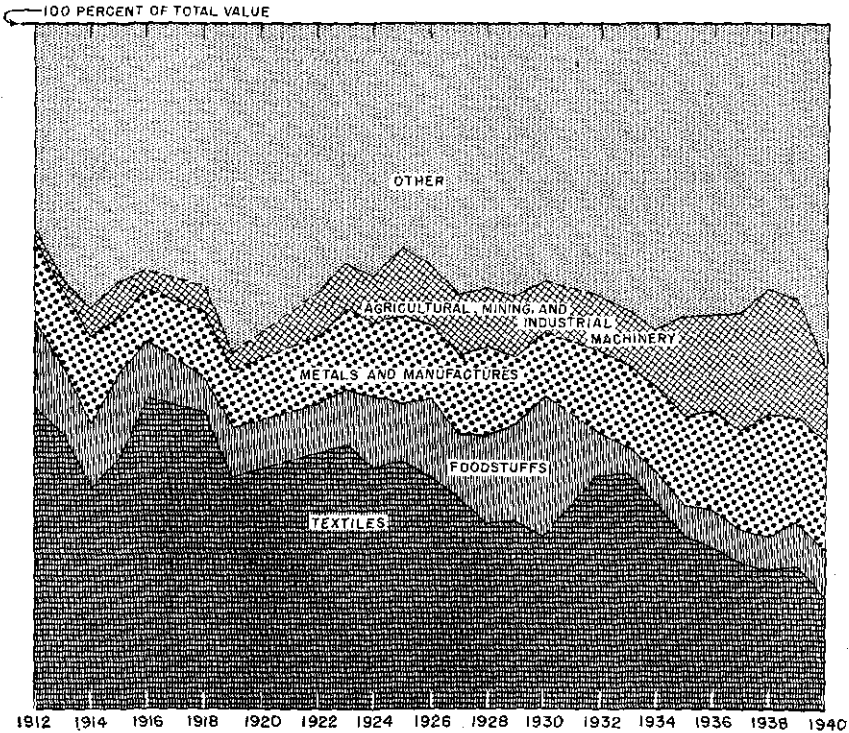


FIGURE 44.—Principal imports into Colombia, by value, as percentages of total imports, 1912-40. (Data are not separately classified for 1920 and 1921.)

Imports cover such a wide variety of items that it is difficult to show many of them. The four groups shown in figure 44 have made up about 60 percent of the total during the period 1912-40. Other important groups are drugs and chemicals, transportation equipment, paper and cardboard, glass and earthenware, and electrical equipment (appendix table 62).

The United States leads as a supplier of Colombian imports, although it has not supplied as large a percentage of total imports as it has taken of total exports (fig. 45). Before the World War the United States and the United Kingdom were running neck and neck as the leading suppliers, with the United Kingdom first in 1912 and the United States in 1913. Germany was important, with 15 percent of the total. During the war the United States replaced Germany en-

tirely and in one year increased its share to over 60 percent of the total. Part of the wartime increase was held by the United States, although not all of it; in the 1920's Germany took an increasing share of the business. During the later 1930's Germany increased its percentage at the expense of Great Britain, but since 1935 the United States' share has risen steadily.

Since the present war started, Germany has about disappeared as a source of supply, and imports from Great Britain have declined sharply. The United States is again supplying most of Colombia's imports. During 1940 it supplied almost 75 percent of the total value.

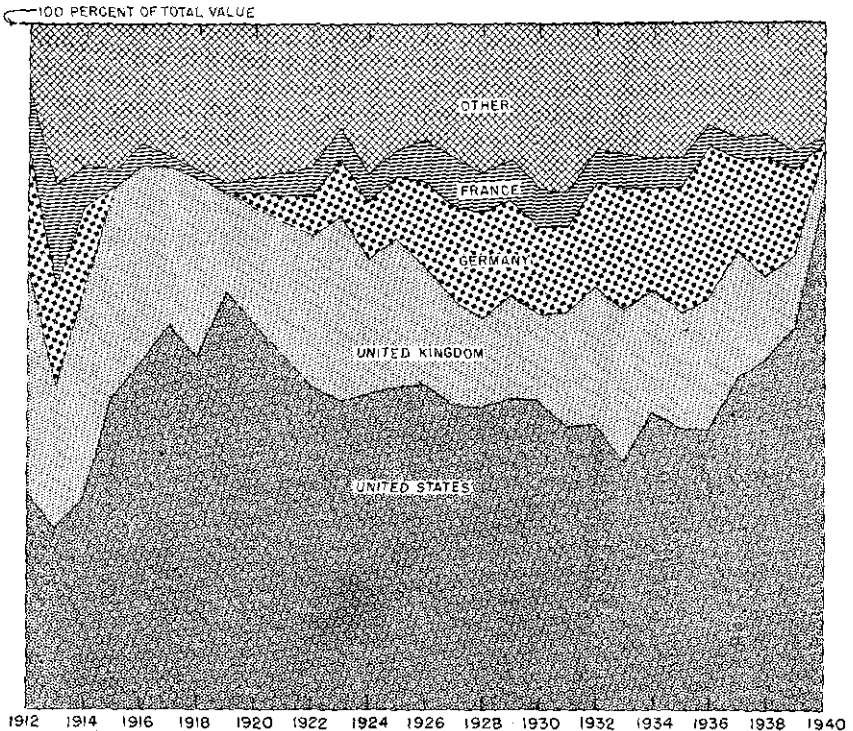


FIGURE 45.—Total imports into Colombia, by value and country of origin, in percentage of total imports, 1912-40. (Data are not separately classified for 1920 and 1921.)

Spain, Italy, the Netherlands, and Belgium have also been important sources of imports in past years, supplying from 2 to 5 percent each of the total value. For the 3 years 1933, 1934, and 1935 Japan furnished about 5 percent of total imports (appendix table 63).

IMPORTANCE OF THE TRADE TO THE UNITED STATES

Merchandise imports into the United States from Colombia have represented from 1.8 to 2.5 percent of the total value of United States imports in the past 3 years, and United States exports to Colombia have constituted 1.3 to 1.6 percent of total exports. Colombia is the sixth most important Latin American market for United States goods

and ranks fifth or sixth as a Latin American supplier of United States needs.

The relative importance of Colombia in the trade of the United States is more clearly shown by data by commodity groupings. Colombia ranks as one of the principal Latin American markets for a wide range of United States exports. The value of the major United States exports to Latin America for the period 1938-40 is given below, together with the proportion of the total taken by Colombia (*4*):

| | <i>Thousand dollars</i> | <i>Percent</i> |
|-------------------------------|-------------------------|----------------|
| Lard..... | 693 | 10.1 |
| Milk, whole dried..... | 147 | 8.3 |
| Hides, leather products..... | 486 | 7.6 |
| Wheat..... | 221 | 11.4 |
| Sugar, refined..... | 188 | 30.2 |
| Rubber and manufactures..... | 1,193 | 11.4 |
| Cigarettes..... | 460 | 18.6 |
| Cotton, raw..... | 1,269 | 43.1 |
| Cotton yarn..... | 412 | 13.4 |
| Textile manufactures..... | 3,014 | 8.1 |
| Paper and materials..... | 1,088 | 7.9 |
| Iron and steel products..... | 6,019 | 8.3 |
| Machinery..... | 11,661 | 9.8 |
| Transportation equipment..... | 9,769 | 7.5 |
| Chemicals and drugs..... | 3,255 | 9.5 |

On the United States import side, Colombia is one of the principal sources of supply for coffee, bananas, and petroleum. The following tabulation indicates the proportion of the total United States imports of these items coming from Colombia during the period 1938-40:

| | <i>Thousand dollars</i> | <i>Per cent</i> |
|----------------|-------------------------|-----------------|
| Coffee..... | 44,747 | 34.1 |
| Bananas..... | 1,758 | 6.1 |
| Petroleum..... | 445 | 2.0 |

Colombia is a potential source of several of the materials listed by the Army and Navy Munitions Board as strategic to national defense. It has been shipping small quantities of mica, rubber, and quinine, and production and exports could no doubt be increased if need be. In addition, it is one of the principal suppliers of platinum, listed as a critical material. Other critical materials which it now produces and which could be produced in larger quantities include tanning materials, hides and skins, and kapok (*32*).

TRADE AGREEMENT WITH THE UNITED STATES

On May 20, 1936, a trade agreement between Colombia and the United States (signed September 13, 1935) became effective. Colombia granted either reductions in duty or bindings of existing tariff rates on more than 150 classifications covering about 58 percent of total imports from the United States. Reductions in duty ranged between 16 and 90 percent of the old rates. Eighty-eight percent of United States imports from Colombia were affected by the agreement.

The Government of each country agreed not to levy any Federal internal tax on any product of the other country that is not levied on the like product grown or produced within its own territory. Provision was made for reciprocal most-favored-nation treatment, as well as for reciprocal national treatment with respect to transporta-

tion charges. The customs concessions are safeguarded by the provision that they will not be impaired by means of quantitative restrictions.

Among the most important concessions to the United States were reductions of 20 to 25 percent in the duty on passenger cars, a 50-percent reduction in the duty on trucks and busses, and a reduction of two-thirds in the duty on business machines and motion-picture equipment. This group of products is one of the most important in the export trade of the United States with Colombia. Reductions of from 25 to 87½ percent were made in duties on certain metals and their manufactures. The reductions range from 19 to 82 percent of previous duties on wearing apparel, and on pharmaceutical products from 35 to 50 percent. Existing duties on a long list of items were bound against increase during the life of the agreement. Some of these items are textile, agricultural, wood, metal, and stone-working machinery; motors, transformers, and certain other electrical equipment; certain types of cloth and yarn; and several kinds of lumber and rubber products.

One of the important concessions in the agricultural classification was a reduction of 50 percent in the duty on lard. The duty had been increased from 5 centavos per gross kilogram in 1929 to 30 centavos in 1931, and the importation of this commodity by Colombia had been greatly restricted as a result. Reductions of 20 to 70 percent were made on fresh, canned, and dried fruits; canned vegetables; salted, smoked, and canned meats; fish; canned and prepared milk; and certain types of tobacco. Tariff increases were barred on uncooked cereals, chewing gum, yeast, and baking powder.¹⁷

The list of items included in the United States concessions is not long, since about 94 percent of the total imports into the United States from Colombia had already been on the free list. Concessions included binding the following products on the free list: Coffee; bananas; uncut emeralds; crude ipecac; crude gutta balata; platinum in ingots, bars, sheets, or plates of a certain thickness, sponge, or scrap; raw reptile skins; tagua nuts; and tamarinds. Reductions of 50 percent were made in the duty on castor beans, natural ipecac partially prepared, and tolu balsams.

The most important advantage to Colombia is the assurance that no duty will be levied on coffee, the chief export and the chief import of the United States from Colombia. The United States is almost the only country where no duty is levied on the importation of coffee; duties in European countries range from 10 to 59 cents a pound.

POSSIBILITIES FOR EXPANDED EXPORTS FROM COLOMBIA

The mission of United States experts that visited Colombia in 1940 found a wide variety of products whose present limited production could be developed for export crops. Two promising ones are copra and cacao, the possibilities for which were discussed in the section on self-sufficiency. A group of fiber products that offers very attractive opportunities for development includes manila hemp, fique, and pita. Certain sections are favorable for rubber growing.

¹⁷ U. S. DEPARTMENT OF STATE. TRADE AGREEMENT BETWEEN UNITED STATES AND COLOMBIA, SIGNED SEPTEMBER 12, 1935. ANALYSIS OF THE GENERAL PROVISIONS AND RECIPROCAL CONCESSIONS. 35 pp. [Mimeographed.] This mimeograph shows the specific changes in rates of duty.

Other products with export possibilities are insecticidal crops, digitalis, sesame, tonka beans, and quinine.

MANILA HEMP

Certain areas are well suited to the production of abacá or manila hemp, particularly on the east and west sides of the Gulf of Uraba, extending to the south on the eastern side of the Atrato Valley. The soils are alluvial and probably above the average in fertility. Since hemp aids in resisting erosion, it could be planted on hillsides as well as on level land. Labor is scarce in this region but could be drawn from the Sinú Valley for from 40 to 60 cents a day, if housing, water supply, and malaria control were provided. The banana root borer attacks manila hemp, but a predator of this pest has been introduced into Puerto Rico, which may cut down the loss from it. Colombia is much nearer the New York market than the Philippines, the present source of supply.

FIQUE

Fique is a plant similar in appearance to sisal. The fiber is strong but sharp. Most of the coffee exported from Colombia is shipped in fique bags. Fique grows wild in Colombia, but can compete with jute and imported sisal because of the high duty on these fibers. The import tax on jute is 7.5 cents a pound and that on sisal 2 cents a pound. Export possibilities would depend on research to produce by chemical process a softer fiber that could compete with jute on export markets.

PITA (33)

Pita, a plant indigenous to Colombia, grows wild throughout many sections of the country and offers interesting possibilities for industrial uses. It is believed that the plant may have been used for centuries by the native Indians. Even now they prize its fiber above others because of its great strength and durability.

The pita plant, *Ananas magdalenae* André belongs to the pineapple family, and the plant is sometimes described as a giant pineapple. It produces long leaves, varying in length from 6 to 12 feet and in width from 2 to 4 inches, which contain fibers of comparable length. Blue or yellow flowers develop in pineapple-like heads in clusters of two or three, but fruits are produced rarely and at irregular intervals. Seeds are therefore not used for propagation. The plant spreads rapidly from new suckers or shoots, which grow from the base of the plant below the soil. Reproduction by this method is so prolific that the plant soon spreads over the surrounding land to the exclusion of all other plants except large trees.

The pita grows under the shade of large trees in tropical sections, but in the higher altitudes it grows just as well without any shade at all. The pita plantations, or pitales, as they are called, occur from sea level to an altitude of 3,000 feet. The plant flourishes in light loamy soils with plenty of humus. It does not grow in soils subject to frequent inundation, although it requires fairly moist surroundings. There is at present no cultivation of the plant, since extensive areas exist in the wild state. It grows so compactly that it is har-

vested without the cost of planting and cultivation. New plants spring up from the rhizomes of the harvested pita, and in a few years a new harvest can be taken from the plant.

The workers cut the leaves with a machete and extract the fiber by placing a leaf on a log of wood, holding one end with their feet, and scratching away the waste material of the leaf with the flattened end of a stick. This is a wasteful process, and efforts are being made to develop a machine that will clean the fiber economically.

The characteristics of the plant are such that it could be used as a substitute for sisal and henequen as well as for weaving into cloth. It produces a longer and stronger fiber than flax. It does not absorb moisture, as does linen, and it would have an advantage for suitings, tires, and similar articles. It is said that the fine cloths used for wrapping the bodies of ancient Indian chiefs were woven from the pita fiber.

BARBASCO AND OTHER INSECTICIDAL PLANTS

Barbasco plants contain rotenone, a chemical that is poisonous to cold-blooded animals, insects, etc. The chief rotenone-bearing plants now used are *Lonchocarpus* spp., which are native to South America, and *Derris* spp., the best known of which are native to the East Indies and the Malay Peninsula. There is a growing demand for rotenone in the manufacture of insecticides. The region around the Gulf of Uraba and inland on both sides of the Atrato Valley has abundant, well-distributed rainfall and soils favorable for the growth of these root crops.

DIGITALIS

Digitalis was introduced into Colombia from the British Isles and is so well adapted to the environment that it has covered whole hillsides of pasture and wasteland, especially around Bogotá. If this wild digitalis is found valuable as a drug plant, a small export industry might be developed to advantage.

QUININE

The eastern slopes of the westernmost Cordillera of Colombia are well suited to the production of the cinchona tree, the source of quinine. It can be cultivated on the hillsides, since it checks rather than encourages erosion. The world supply comes largely from Java at present, and the Netherlanders have a cartel controlling the price of the product. Labor costs in Colombia are higher than in Java, but the soil fertility in many places is greater in Colombia. Experimentation with quinine seems worth while, although surveys of world market conditions would be necessary before production was expanded.

SESAME

Sesame seeds have a high content of edible oil. The plant is well adapted to the Tolima Valley and could be grown in the Cauca and Sinú Valleys. Vegetable-oil production is protected by a high tariff, and already the production of sesame is spreading rapidly.

OIL PALMS

Certain species of the oil palm are native to Colombia, Panama, and the Canal Zone, and environmental conditions in Colombia are well adapted for the growth of the so-called African oil palm, *Elaeis Guineensis*.¹⁸ Before the war the demand for palm oil and palm-kernel oil was declining, but the reduced supply of these oils from the Far East should stimulate increased production in the American Tropics. The palm oil from the pulp of the fruit is used in making soap and candles, and in the plate industry for coating iron. The palm-kernel oil is used in soap, in food products, and in perfumery.

TONKA BEANS

The tonka bean produces a flavoring used as a substitute for vanilla and in perfumes, liquors, and tobacco. The trees grow naturally in the Orinoco Valley in eastern Colombia and southern Venezuela. The plant is well adapted to the lowlands of Colombia and could be developed on a commercial scale. The bean sells in the New York market for about \$1.80 a pound.

RUBBER

The prospects of Pará rubber development in tropical America, including Colombia, are being studied by the United States Department of Agriculture in cooperation with government agencies of the Latin American countries. A comprehensive report is being prepared on the areas in Colombia suitable for rubber development.

SUMMARY

Colombia is primarily an agricultural country, and it is to agriculture that the native population must continue to look for its livelihood. Rich oil fields are producing an increasing amount of income, but it goes largely to foreign owners of the wells. Coffee, and to a lesser extent bananas, furnish foreign exchange for the purchase of imports. Physical conditions are excellent for expanded production of these crops and also of a range of other products suitable for export. Expansion in coffee and banana production must wait more settled world conditions, but markets could no doubt be developed at once for many of the potential exports of the country, including figue, pita, and manila hemp fibers, quinine, rubber, etc.

Staple food and fiber crops produced for domestic consumption include corn, wheat, rice, sugar, beans, oils and fats, cotton, and figue. Domestic production of corn and beans is sufficient for local needs, but it is necessary to import wheat, rice, sugar, and cotton to supplement domestic production. Imported vegetable oils, particularly from copra, account for about 70 percent of total requirements. Expansion in production of certain of these items, at least to the point of self-sufficiency, appears feasible. Prospects for expansion are particularly favorable for copra, cacao, and sugar.

¹⁸ A discussion and comparison of the African oil palm and the native American species *Alfonsia olerifera* is found in the article by COOK, O. F., OIL PALMS IN FLORIDA, HAITI, AND PANAMA. Natl. Hort. Mag. reprint, 35 pp., illus. 1940.

Except for the two major export crops—coffee and bananas—the agriculture of Colombia is still conducted largely in a primitive fashion. Transportation difficulties hamper the movement of goods from one section of the country to another and have tended to build up relatively self-contained regions. This has resulted in uneconomic production in certain areas and prevented the specialization of production in the most efficient producing zones. Transportation facilities have been improved slowly. The railway developments usual in North America have not appeared feasible in parts of the South American Continent because of the rugged terrain. Travel by airplane is rapidly proving a solution to the problem of passenger transportation; and the extensive use of airplanes for freight hauls would foster the development of areas now inaccessible to markets and provide for a more economic utilization of producing regions.

Since the Government of Colombia is becoming more and more interested in the development of the agricultural industry, it may be possible to secure more regional planning, improved varieties of seed, and modern methods of planting and cultivation. Expanded cultivation of products complementary to those grown in the United States offers a basis for increased exchange of goods between these two countries.

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APPENDIX

TABLE 42.—Value of agricultural production of major crops in Colombia, 1937-38

| Administrative division | Cof-fee ¹ | Banan-as ¹ | Corn | Sugar ² | Wheat | Beans | Pota-toes | Rice | Cot-ton | Cacao | Fj-que ³ |
|----------------------------------|----------------------|-----------------------|---------------|--------------------|------------------|---------------|---------------|---------------|------------------|------------------|---------------------|
| | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars | 1,000 dollars |
| Department: | | | | | | | | | | | |
| Antioquia..... | | | 4,311 | | 8 | 1,465 | 977 | 355 | 24 | 315 | 138 |
| Atlántico..... | | | 135 | | | 13 | | 38 | 661 | | |
| Bolívar..... | | | 1,204 | | | 39 | | 1,461 | 186 | 17 | |
| Boyacá..... | | | 1,510 | | 2,046 | 90 | 2,028 | 22 | 82 | 18 | 123 |
| Caldas..... | | | 1,439 | | | 19 | 567 | 443 | 11 | 1 | 52 |
| Cauca..... | | | 304 | | | 98 | 91 | 97 | 395 | (⁴) | 1,385 |
| Cundinamarca..... | | | 2,080 | | 2,850 | 112 | 2,947 | 120 | 41 | 77 | 69 |
| Huila..... | | | 177 | | | 25 | 12 | 214 | (⁴) | 349 | 5 |
| Magdalena..... | 4,971 | | 371 | | | 49 | 6 | 62 | 365 | 43 | 22 |
| Nariño..... | | | 449 | | 482 | 42 | 1,768 | 370 | | 13 | 25 |
| Norte de Santan-der..... | | | 112 | | 341 | 64 | 115 | 85 | 6 | 9 | 34 |
| Santander..... | | | 1,296 | | 125 | 52 | 413 | 339 | 266 | 89 | 465 |
| Tolima..... | | | 431 | | 21 | 125 | 300 | 353 | 283 | 32 | 3 |
| Valle..... | | | 1,207 | | (⁴) | 340 | 295 | 934 | 48 | 950 | 1 |
| Department to-tal..... | | 4,971 | 15,028 | 5,444 | 5,990 | 3,074 | 9,401 | 4,769 | 1,972 | 3,351 | 995 |
| Intendencias and Comisarías..... | | | 268 | | | 179 | 29 | 454 | 1 | 5 | (⁴) |
| Total Colombia..... | 49,670 | 4,971 | 15,296 | 5,444 | 5,990 | 3,253 | 9,430 | 5,213 | 1,973 | 3,356 | 995 |

¹ Export value.² Value of product of sugar mills.³ 1934 figures, converted at the rate of 1 peso=61.77 cents.⁴ Less than 500 dollars.

Basic data from Anuario General de Estadística, 1937 (7).

TABLE 43.—Area in major crops in Colombia, 1937-38

| Administrative division | Coffee ¹ | Bananas ² | Corn | Sugar | Wheat | Beans | Potatoes | Rice | Cotton | Cacao | Tobacco | Figue ³ | Area in major crops | Total area |
|-------------------------------|---------------------|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------------|---------------------|--------------------|
| | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 acres</i> | <i>1,000 acres</i> |
| Department: | | | | | | | | | | | | | | |
| Antioquia..... | 173,358 | | 240,903 | 72,949 | 502 | 70,419 | 12,407 | 8,887 | 1,179 | 8,406 | 3,603 | 6,392 | 598 | 16,262 |
| Atlántico..... | | | 18,772 | 4,337 | | 638 | | 897 | 55,563 | | | | 81 | 858 |
| Bolívar..... | 2,725 | | 199,165 | 42,704 | | 3,440 | | 70,627 | 10,032 | | 9,035 | | 339 | 14,717 |
| Bogotá..... | 11,585 | | 158,700 | 76,477 | 219,585 | 11,082 | 28,963 | 1,196 | 4,220 | | 435 | 5,666 | 615 | 15,958 |
| Caldas..... | 213,204 | | 80,878 | 35,501 | 1,028 | 28,115 | 6,249 | 1,806 | 42 | 1,735 | 106 | 1,853 | 370 | 3,394 |
| Cauca..... | 29,742 | | 35,763 | 24,772 | 111,713 | 14,762 | 1,984 | 5,184 | 59 | 10,851 | 255 | 2,805 | 144 | 7,462 |
| Cundinamarca..... | 104,150 | | 226,816 | 175,117 | 182,610 | 7,139 | 35,586 | 2,797 | 944 | 1,048 | 22 | 3,173 | 740 | 5,829 |
| Huila..... | 24,048 | | 34,026 | 9,259 | | 2,026 | 235 | 5,282 | 2 | 24,468 | 603 | 237 | 100 | 5,115 |
| Magdalena..... | 14,840 | 150,000 | 40,166 | 8,663 | | 4,838 | 172 | 1,866 | 22,889 | | 363 | 684 | 1,025 | 245 |
| Nariño..... | 9,562 | | 92,923 | 48,408 | 41,745 | 4,468 | 69,398 | 7,719 | | 825 | 593 | 1,134 | 264 | 7,391 |
| Norte de Santander..... | 67,969 | | 12,516 | 16,158 | 25,659 | 5,515 | 2,387 | 3,823 | 297 | 563 | 264 | 1,669 | 137 | 5,310 |
| Santander..... | 50,695 | | 91,331 | 76,641 | 10,040 | 5,570 | 4,855 | 10,543 | 6,128 | 3,598 | 15,521 | 1,635 | 297 | 7,924 |
| Tolima..... | 162,878 | | 56,910 | 49,527 | 412 | 6,029 | 8,137 | 7,717 | 4,038 | 2,409 | 2,387 | 156 | 281 | 5,681 |
| Valle..... | 103,934 | | 75,813 | 46,371 | 12 | 14,018 | 3,336 | 23,550 | 1,554 | 19,739 | 8,323 | 67 | 292 | 5,174 |
| Department total..... | 968,327 | 150,000 | 1,361,688 | 672,869 | 493,304 | 178,058 | 166,659 | 151,486 | 106,947 | 81,160 | 36,815 | 45,612 | 4,413 | 114,318 |
| Intendencia: | | | | | | | | | | | | | | |
| Amazonas..... | | | | | | | | 10 | | | | | | 30,724 |
| Chocó..... | | | | 828 | | | 247 | | | | 7 | | 1 | 11,507 |
| Meta..... | | | | | | | | 13,876 | | 99 | 42 | 15 | 14 | 21,058 |
| San Andrés y Providencia..... | | | | | | | | | 37 | | | | | 15 |
| Comisaría: | | | | | | | | | | | | | | |
| Arauca..... | | | | | | | | 37 | | 203 | | | | 6,383 |
| Caquetés..... | | | | 235 | | | | 205 | | | 418 | | 1 | 25,449 |
| Goajira..... | | | | | | | | | | | | | | 3,025 |
| Putumayo..... | | | | 203 | | | | | | | | | | 6,541 |
| Vaupés..... | | | | | | | | 363 | | | | | | 37,028 |
| Vichada..... | | | 12,552 | | | 1,080 | | | | | | 2 | 14 | 25,449 |
| Total Colombia..... | 968,327 | 150,000 | 1,374,240 | 674,135 | 493,304 | 179,139 | 166,906 | 165,977 | 106,984 | 81,402 | 37,282 | 45,629 | 4,443 | 281,486 |

¹ No coffee census has been taken since 1932. The National Federation of Coffee Growers of Colombia has arbitrarily added 10 percent to 1932 figures to obtain the 1938 acreage.

² Includes only the estimated commercial banana area of Santa Marta.

³ 1934 data.

Compiled from official Colombian sources (7, 12).

TABLE 44.—Property valuation in Colombia, 1939

| Administrative division | Rural | | | Total | | |
|-------------------------------|-----------------|----------------------|----------------|-----------------|----------------------|----------------|
| | Number of farms | Tax value | Average value | Number of farms | Tax value | Average value |
| | | <i>1,000 dollars</i> | <i>Dollars</i> | | <i>1,000 dollars</i> | <i>Dollars</i> |
| Department: | | | | | | |
| Antioquia..... | 33,780 | 37,833 | 1,712 | 52,221 | 114,245 | 2,188 |
| Atlántico..... | 6,140 | 4,312 | 702 | 32,453 | 35,767 | 1,102 |
| Bolívar..... | 35,420 | 21,434 | 605 | 81,555 | 41,811 | 512 |
| Boyacá..... | 156,726 | 64,550 | 412 | 172,510 | 73,060 | 427 |
| Caldas..... | 36,203 | 37,907 | 1,599 | 57,718 | 93,999 | 1,629 |
| Cauca..... | 27,634 | 16,942 | 613 | 37,095 | 23,800 | 642 |
| Cundinamarca..... | 128,895 | 93,312 | 724 | 185,078 | 254,491 | 1,375 |
| Huila..... | 12,684 | 11,529 | 909 | 18,427 | 15,673 | 851 |
| Magdalena..... | 18,965 | 18,971 | 1,000 | 47,626 | 27,604 | 580 |
| Nariño..... | 34,355 | 10,887 | 317 | 42,000 | 16,298 | 388 |
| Norte de Santander..... | 38,156 | 27,449 | 719 | 56,389 | 41,920 | 743 |
| Santander..... | 81,825 | 37,274 | 456 | 108,577 | 52,991 | 488 |
| Tolima..... | 40,347 | 40,168 | 996 | 56,097 | 51,718 | 922 |
| Valle..... | 38,840 | 60,624 | 1,561 | 78,106 | 113,671 | 1,455 |
| Intendencia: | | | | | | |
| Chocó..... | 4,734 | 3,494 | 738 | 7,838 | 6,920 | 883 |
| Meta..... | 2,981 | 1,638 | 549 | 4,793 | 2,047 | 427 |
| San Andrés y Providencia..... | 3,705 | 357 | 96 | 4,464 | 436 | 98 |
| Total Colombia..... | 701,420 | 528,681 | 754 | 1,042,976 | 967,061 | 927 |

NONTAXABLE PROPERTY

| Type | Number of farms | Value | Average value |
|--|-----------------|----------------------|----------------|
| | | <i>1,000 dollars</i> | <i>Dollars</i> |
| Private..... | 209,463 | 58,642 | 280 |
| National..... | 885 | 42,891 | 48,415 |
| Departmental..... | 780 | 14,827 | 19,009 |
| Municipal..... | 9,199 | 41,791 | 4,543 |
| Ecclesiastical..... | 4,298 | 49,459 | 11,507 |
| Public education..... | 583 | 3,927 | 6,736 |
| Charitable..... | 727 | 7,383 | 10,155 |
| Total..... | 225,935 | 218,920 | 971 |
| Total taxable and nontaxable property..... | 1,272,411 | 1,187,050 | 933 |

Basic data from Anuario General de Estadística, 1939 (7). Conversions made from pesos at average exchange rate for 1939, 1 peso=57.06 cents.

TABLE 45.—Principal coffee centers in Colombia and distance from them to ports by various methods of transportation

| Department | Coffee centers | Rail-road | River transportation | High-way | Cable-way | Total distance | Ocean shipping port |
|--------------------|----------------|-----------|----------------------|----------|-----------|----------------|-----------------------------|
| | | Miles | Miles | Miles | Miles | Miles | |
| antioquia | Medellin | 137 | 455 | | | 592 | Puerto Colombia, Cartagena. |
| | Medellin | 185 | 397 | | | 582 | |
| | Manizales | 282 | | | | 282 | |
| Caldas | Manizales | 49 | 555 | | 45 | 649 | Puerto Colombia, Cartagena. |
| | Manizales | 97 | 495 | | 45 | 637 | |
| | Armenia | 224 | | | | 224 | |
| Cauca | Popayan | 234 | | | | 234 | Buenaventura, Buenaventura. |
| | Bogotá | 207 | | | | 207 | |
| | Bogotá | 128 | 553 | | | 681 | |
| Cundinamarca | Bogotá | 176 | 493 | | | 669 | Puerto Colombia, Cartagena. |
| | Girardot | 17 | 677 | | | 694 | |
| | Girardot | 65 | 618 | | | 683 | |
| Huila | Neiva | 114 | 677 | | | 791 | Puerto Colombia, Cartagena. |
| | Neiva | 162 | 618 | | | 780 | |
| Magdalena | Santa Marta | | | | | | Santa Marta. |
| Nariño | Pasto | 57 | 10 | 119 | | 186 | Tumaco. |
| Santander | Bucaramanga | 85 | 374 | 12 | | 471 | Puerto Colombia, Cartagena. |
| | Bucaramanga | 133 | 314 | 12 | | 459 | |
| | Cúcuta | 99 | 180 | | | 279 | |
| Norte de Santander | Ocaña | 17 | 297 | | 29 | 343 | Puerto Colombia, Cartagena. |
| | Ocaña | 65 | 237 | | 29 | 331 | |
| | Ibagué | 140 | 555 | | | 695 | |
| Tolima | Ibagué | 188 | 495 | | | 683 | Puerto Colombia, Cartagena. |
| | Honda | 17 | 591 | 2 | | 610 | |
| | Honda | 65 | 531 | 2 | | 598 | |
| | Libano | 66 | 555 | 17 | | 638 | |
| | Libano | 114 | 495 | 17 | | 626 | |
| Caldas | La Dorada | 17 | 555 | | | 572 | Puerto Colombia, Cartagena. |
| | La Dorada | 65 | 495 | | | 560 | |
| Valle | Cali | 108 | | | | 108 | Buenaventura. |
| | Sevilla | 174 | | 23 | | 197 | |

TABLE 46.—Coffee exports from Colombia, 1906-40

| Year | Exports | Year | Exports |
|------|--------------------------|------|--------------------------|
| | 1,000 sacks ¹ | | 1,000 sacks ¹ |
| 1906 | 636 | 1924 | 2,216 |
| 1907 | 402 | 1925 | 1,947 |
| 1908 | 607 | 1926 | 2,454 |
| 1909 | 707 | 1927 | 2,357 |
| 1910 | 570 | 1928 | 2,660 |
| 1911 | 632 | 1929 | 2,836 |
| 1912 | 933 | 1930 | 3,173 |
| 1913 | 1,021 | 1931 | 3,034 |
| 1914 | 1,032 | 1932 | 3,186 |
| 1915 | 1,128 | 1933 | 3,327 |
| 1916 | 1,211 | 1934 | 3,084 |
| 1917 | 1,047 | 1935 | 3,769 |
| 1918 | 1,149 | 1936 | 3,942 |
| 1919 | 1,684 | 1937 | 4,178 |
| 1920 | 1,444 | 1938 | 4,274 |
| 1921 | 2,345 | 1939 | 3,739 |
| 1922 | 1,764 | 1940 | 4,484 |
| 1923 | 2,062 | | |

¹ In sacks of 60 kilograms (132 pounds).

TABLE 47.—Number of farms producing corn in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Area in corn | Average acreage | Production | Yield per acre |
|----------------------------------|---------------|--------------------|-----------------|----------------------|----------------|
| Department: | <i>Number</i> | <i>1,000 acres</i> | <i>Acres</i> | <i>1,000 bushels</i> | <i>Bushels</i> |
| Antioquia..... | 25,653 | 240.9 | 9.4 | 3,827.8 | 15.9 |
| Atlántico..... | 3,479 | 18.8 | 5.4 | 330.9 | 17.6 |
| Bolívar..... | 17,928 | 199.2 | 11.1 | 2,119.4 | 10.6 |
| Boyacá..... | 62,572 | 155.7 | 2.5 | 1,703.1 | 10.9 |
| Caldas..... | 16,733 | 80.8 | 4.8 | 1,479.0 | 18.3 |
| Cauca..... | 13,331 | 35.8 | 2.7 | 508.3 | 14.6 |
| Cundinamarca..... | 43,502 | 226.8 | 5.2 | 2,739.3 | 12.1 |
| Huila..... | 4,502 | 34.0 | 7.6 | 286.7 | 8.4 |
| Magdalena..... | 8,582 | 40.2 | 4.7 | 809.0 | 20.1 |
| Nariño..... | 12,998 | 92.9 | 7.1 | 1,108.1 | 12.6 |
| Norte de Santander..... | 3,211 | 12.5 | 3.9 | 165.7 | 13.2 |
| Santander..... | 22,350 | 91.3 | 4.1 | 1,628.3 | 17.8 |
| Tolima..... | 10,240 | 56.9 | 5.6 | 700.0 | 12.5 |
| Valle..... | 11,982 | 75.8 | 6.3 | 1,562.8 | 20.6 |
| Intendencias and Comisarías..... | 1,682 | 12.6 | 7.5 | 272.6 | 21.6 |
| Total..... | 258,734 | 1,374.2 | 6.6 | 19,310.1 | 14.0 |

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TABLE 48.—Number of farms producing beans in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Area in beans | Average acreage | Production | Yield per acre |
|----------------------------------|---------------|---------------|-----------------|---------------------|----------------|
| Department: | <i>Number</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 pounds</i> | <i>Pounds</i> |
| Antioquia..... | 19,218 | 70,419 | 3.7 | 30,460 | 432.4 |
| Atlántico..... | 343 | 638 | 1.9 | 179 | 280.5 |
| Bolívar..... | 1,492 | 3,440 | 2.3 | 1,625 | 472.4 |
| Boyacá..... | 19,351 | 11,082 | .6 | 2,814 | 253.9 |
| Caldas..... | 16,647 | 28,115 | 1.7 | 14,563 | 518.0 |
| Cauca..... | 7,134 | 14,762 | 2.1 | 3,804 | 257.7 |
| Cundinamarca..... | 10,205 | 7,139 | .7 | 2,983 | 417.8 |
| Huila..... | 1,511 | 2,026 | 1.3 | 1,037 | 511.8 |
| Magdalena..... | 1,515 | 4,838 | 3.2 | 1,640 | 339.0 |
| Nariño..... | 2,982 | 4,468 | 1.5 | 1,300 | 290.9 |
| Norte de Santander..... | 2,608 | 5,515 | 2.1 | 2,710 | 491.4 |
| Santander..... | 6,918 | 5,370 | .8 | 2,555 | 458.5 |
| Tolima..... | 3,798 | 6,029 | 1.6 | 1,960 | 325.1 |
| Valle..... | 4,512 | 14,018 | 3.1 | 9,017 | 643.2 |
| Intendencias and Comisarías..... | 240 | 1,080 | 4.5 | 2,940 | 272.2 |
| Total..... | 98,474 | 179,139 | 1.8 | 79,577 | 444.2 |

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TABLE 49.—Number of farms producing rice in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Total area | Average size | Area in rice | Average acreage in rice | Production (rough rice) | Yield per acre (rough rice) |
|-------------------------|--------|------------|--------------|--------------|-------------------------|-------------------------|-----------------------------|
| | Number | Acres | Acres | Acres | Acres | Bushels | Bushels |
| Antioquia | 1,138 | 158,920 | 139.6 | 8,887 | 7.8 | 287,747 | 32.3 |
| Atlántico | 101 | 19,434 | 192.4 | 897 | 8.9 | 45,136 | 50.3 |
| Bolívar | 5,188 | 732,310 | 141.2 | 70,627 | 13.6 | 2,440,312 | 34.5 |
| Boyacá | 291 | 49,225 | 169.1 | 1,196 | 4.1 | 18,407 | 15.4 |
| Caldas | 190 | 2,187 | 21.8 | 1,306 | 13.9 | 7,622 | 54.6 |
| Cauca | 337 | 56,156 | 166.6 | 6,186 | 18.4 | 354,161 | 68.3 |
| Cundinamarca | 306 | 32,281 | 105.5 | 2,797 | 9.1 | 102,422 | 36.6 |
| Huila | 112 | 37,987 | 339.2 | 5,282 | 47.2 | 184,281 | 34.9 |
| Magdalena | 162 | 13,640 | 84.2 | 1,866 | 11.5 | 81,779 | 43.8 |
| Nariño | 1,578 | 189,301 | 120.0 | 7,719 | 4.9 | 435,298 | 56.4 |
| Norte de Santander | 498 | 28,449 | 57.1 | 3,823 | 7.6 | 60,810 | 18.3 |
| Santander | 584 | 428,943 | 734.4 | 10,543 | 18.0 | 315,636 | 20.0 |
| Tolima | 263 | 151,069 | 574.5 | 7,717 | 29.3 | 323,566 | 43.2 |
| Valle | 424 | 211,860 | 499.7 | 23,550 | 55.5 | 852,246 | 36.2 |
| Amazonas | 4 | 4,942 | 1,235.5 | 10 | 2.5 | 690 | 69.0 |
| Meta | 482 | 177,200 | 367.6 | 13,876 | 28.8 | 378,003 | 27.2 |
| Arauca | 15 | 126 | 8.4 | 37 | 2.4 | 817 | 22.1 |
| Caquetá | 40 | 9,884 | 247.1 | 205 | 5.1 | 8,289 | 40.4 |
| Vaupés | 12 | 830 | 69.2 | 363 | 30.2 | 6,163 | 22.3 |
| Total | 11,635 | 2,304,974 | 198.1 | 165,977 | 14.3 | 5,924,325 | 35.7 |

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TABLE 50.—Number of farms producing potatoes in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Area in potatoes | Average acreage | Production | Yield per acre |
|-------------------------|--------|------------------|-----------------|------------|----------------|
| | Number | Acres | Acres | Bushels | Bushels |
| Department: | 5,418 | 12,467 | 2.3 | 846,953 | 68.3 |
| Atlántico | | | | | |
| Bolívar | | | | | |
| Boyacá | 29,864 | 28,968 | 1.0 | 2,587,608 | 89.4 |
| Caldas | 1,288 | 6,249 | 4.9 | 352,404 | 56.4 |
| Cauca | 3,297 | 1,984 | .6 | 107,225 | 54.0 |
| Cundinamarca | 15,001 | 33,586 | 2.4 | 2,745,049 | 77.1 |
| Huila | 394 | 255 | .7 | 8,724 | 34.2 |
| Magdalena | 33 | 72 | 2.2 | 3,628 | 50.4 |
| Nariño | 15,978 | 62,398 | 3.9 | 2,591,694 | 41.5 |
| Norte de Santander | 1,445 | 2,387 | 1.7 | 131,093 | 54.9 |
| Santander | 2,274 | 4,885 | 2.1 | 459,046 | 94.0 |
| Tolima | 1,142 | 8,137 | 7.1 | 423,746 | 52.1 |
| Valle | 847 | 3,336 | 3.9 | 218,393 | 65.5 |
| Intendencia del Chocó | 80 | 247 | 3.1 | 16,075 | 65.1 |
| Total | 77,051 | 166,906 | 2.2 | 10,491,937 | 62.9 |

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TABLE 51.—Number of farms producing sugar in Colombia and acreage and production, 1937-38

| Administrative division | Farms | Area in sugar | Average acreage | Production | |
|-------------------------|--------|---------------|-----------------|--------------|--|
| | | | | Raw sugar | Total, including panela, miel, and pan |
| | Number | Acres | Acres | 1,000 pounds | 1,000 pounds |
| Antioquia..... | 3,452 | 72,949 | 21.1 | | 182,664 |
| Atlántico..... | 325 | 4,337 | 13.3 | | 9,903 |
| Bolívar..... | 2,730 | 42,704 | 15.6 | 31,407 | 91,628 |
| Boyacá..... | 11,185 | 76,477 | 6.8 | | 49,799 |
| Caldas..... | 4,004 | 35,501 | 8.9 | | 78,445 |
| Cauca..... | 6,350 | 24,772 | 3.9 | 2,733 | 36,204 |
| Cundinamarca..... | 13,378 | 175,117 | 13.1 | 9,101 | 158,645 |
| Huila..... | 2,832 | 9,259 | 3.3 | | 13,819 |
| Magdalena..... | 606 | 8,653 | 14.3 | | 15,984 |
| Nariño..... | 3,385 | 43,468 | 12.8 | | 49,289 |
| Norte de Santander..... | 2,016 | 16,158 | 8.0 | 493 | 49,070 |
| Santander..... | 9,722 | 76,641 | 7.9 | | 103,556 |
| Tolima..... | 3,352 | 40,527 | 12.1 | | 81,494 |
| Valle..... | 2,215 | 46,371 | 20.9 | 47,869 | 182,524 |
| Chocó..... | 36 | 828 | 23.0 | 1,298 | 1,527 |
| Caquetá..... | 63 | 235 | 3.7 | | 182 |
| Putumayo..... | 14 | 203 | 14.5 | | 181 |
| Total..... | 65,665 | 674,135 | 10.3 | 92,901 | 1,104,884 |

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TABLE 52.—Number of farms producing wheat in Colombia and acreage, production, and yield, 1937-38

| Department | Farms | Total area | Average size | Area in wheat | Average acreage | Production | Yield per acre |
|-------------------------|--------|------------|--------------|---------------|-----------------|------------|----------------|
| | Number | Acres | Acres | Acres | Acres | Bushels | Bushels |
| Antioquia..... | 33 | 2,046 | 62.0 | 502 | 15.2 | 3,775 | 7.5 |
| Boyacá..... | 30,741 | 723,830 | 23.5 | 219,585 | 7.1 | 1,207,993 | 5.5 |
| Caldas..... | 41 | 9,256 | 225.8 | 1,028 | 25.1 | 10,561 | 10.3 |
| Cauca..... | 2,212 | 76,670 | 31.7 | 11,713 | 5.3 | 69,333 | 5.9 |
| Cundinamarca..... | 12,005 | 546,664 | 45.2 | 182,610 | 15.1 | 1,504,290 | 8.2 |
| Nariño..... | 7,758 | 395,063 | 50.9 | 41,743 | 5.4 | 267,622 | 6.4 |
| Norte de Santander..... | 1,747 | 208,523 | 119.4 | 25,659 | 14.7 | 185,405 | 7.2 |
| Santander..... | 1,011 | 26,407 | 26.1 | 10,040 | 9.9 | 77,441 | 7.7 |
| Tolima..... | 25 | 8,254 | 250.2 | 412 | 16.5 | 8,597 | 20.9 |
| Valle..... | 3 | 1,069 | 356.0 | 12 | 4.0 | 94 | 7.8 |
| Total..... | 55,666 | 1,989,172 | 35.7 | 493,304 | 8.9 | 3,335,111 | 6.8 |

Basic data from Anuario General de Estadística, 1937 (7).

TABLE 53.—Number of farms producing cacao in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Pro- ducing trees | Total area in farms | Aver- age size | Area in cacao | Aver- age acreage | Produc- tion | Yield | |
|-------------------------|--------|-------------------------|---------------------------|----------------------|---------------------|-------------------------|-----------------|-------------|-------------|
| | | | | | | | | Per tree | Per acre |
| | Number | Thou- sands | Acres | Acres | Acres | Acres | 1,000 pounds | Pounds | Pounds |
| Antioquia..... | 771 | 827 | 215,412 | 279.4 | 8,406 | 10.9 | 2,064 | 2.49 | 245.5 |
| Atlántico..... | 68 | 111 | 15,249 | 224.3 | 670 | 9.9 | 184 | 1.65 | 274.6 |
| Bolívar..... | 102 | 95 | 22,701 | 222.5 | 435 | 4.3 | 122 | 1.29 | 280.5 |
| Boyacá..... | 236 | 167 | 53,952 | 227.6 | 1,735 | 7.4 | 325 | 1.95 | 187.3 |
| Cauca..... | 1,635 | 4,186 | 89,873 | 54.9 | 16,851 | 10.3 | 10,228 | 2.45 | 607.0 |
| Cundinamarca..... | 163 | 176 | 15,498 | 95.1 | 1,048 | 6.4 | 727 | 4.13 | 695.7 |
| Huila..... | 571 | 2,406 | 164,462 | 288.0 | 24,463 | 42.8 | 2,678 | 1.17 | 109.4 |
| Magdalena..... | 96 | 72 | 825 | 8.6 | 363 | 3.8 | 426 | 5.92 | 1,180.0 |
| Nariño..... | 282 | 48 | 22,541 | 115.4 | 115.4 | 2.9 | 204 | 4.25 | 247.3 |
| Norte de Santander..... | 285 | 54 | 18,088 | 63.5 | 583 | 2.0 | 65 | 1.20 | 115.5 |
| Santander..... | 261 | 428 | 71,765 | 275.0 | 3,583 | 13.8 | 616 | 1.44 | 171.2 |
| Tolima..... | 416 | 372 | 102,356 | 246.0 | 2,409 | 5.8 | 248 | 2.66 | 102.9 |
| Valle..... | 3,088 | 3,352 | 164,322 | 53.2 | 19,739 | 6.4 | 7,118 | 2.12 | 360.6 |
| Meta..... | 1 | 42 | 3,163 | 3,163.0 | 99 | 99.0 | | | |
| Arauca..... | 14 | 42 | 212 | 15.1 | 263 | 14.5 | 39 | .93 | 192.1 |
| Total..... | 7,989 | 12,316 | 970,419 | 121.4 | 81,402 | 10.2 | 25,041 | 2.03 | 307.7 |

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TABLE 54.—Number of farms producing cotton in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Total area | Average size | Area in cotton | Average acreage | Produc- tion of seed cotton | Yield per acre | |
|---------------------------------------|--------|---------------|-----------------|-------------------|--------------------|--------------------------------------|-------------------|--------|
| | | | | | | | 1,000 pounds | Pounds |
| | Number | Acres | Acres | Acres | Acres | 1,000 pounds | Pounds | |
| Antioquia..... | 50 | 3,153 | 63.0 | 1,179 | 23.6 | 478 | 406.5 | |
| Atlántico..... | 1,915 | 209,068 | 156.2 | 55,563 | 29.0 | 13,714 | 246.8 | |
| Bolívar..... | 830 | 136,540 | 164.5 | 10,032 | 12.1 | 3,894 | 388.2 | |
| Boyacá..... | 939 | 24,347 | 25.9 | 4,220 | 4.5 | 1,585 | 375.6 | |
| Caldas..... | 3 | 2,758 | 919.3 | 42 | 14.0 | 29 | 690.5 | |
| Cauca..... | 9 | 1,443 | 160.3 | 59 | 6.7 | 10 | 169.5 | |
| Cundinamarca..... | 22 | 5,775 | 262.5 | 944 | 42.9 | 814 | 862.2 | |
| Huila..... | 1 | 247 | 247 | 2 | 2.0 | (?) | | |
| Magdalena..... | 572 | 80,483 | 140.7 | 22,889 | 40.0 | 8,994 | 392.9 | |
| Nariño..... | | | | | | | | |
| Norte de Santander..... | 77 | 2,471 | 32.1 | 297 | 3.9 | 132 | 444.4 | |
| Santander..... | 354 | 65,052 | 183.7 | 6,128 | 17.3 | 4,855 | 792.5 | |
| Tolima..... | 53 | 84,980 | 1,603.4 | 4,038 | 76.1 | 6,066 | 1,503.3 | |
| Valle..... | 10 | 11,873 | 1,187.3 | 1,564 | 155.2 | 946 | 609.5 | |
| San Andrés y Providencia..... | 24 | 593 | 24.7 | 37 | 1.5 | 25 | 675.7 | |
| Total..... | 4,859 | 718,783 | 147.9 | 106,984 | 22.0 | 41,542 | 388.4 | |
| Ginned cotton equivalent ¹ | | | | | | 12,877 | 120.4 | |

¹ Ginned cotton=31 percent of seed cotton.

² Less than 500 pounds.

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TABLE 55.—Number of farms producing tobacco in Colombia and acreage, production, and yield, 1937-38

| Administrative division | Farms | Area in tobacco | Average acreage cultivated | Production | Yields per acre |
|-------------------------|---------------|-----------------|----------------------------|---------------------|-----------------|
| Department: | <i>Number</i> | <i>Acres</i> | <i>Acres</i> | <i>1,000 pounds</i> | <i>Pounds</i> |
| Antioquia | 806 | 3,603 | 4.5 | 3,065 | 850.7 |
| Atlántico | | | | | |
| Bolívar | 4,318 | 0,035 | 2.1 | 9,676 | 1,071.1 |
| Boyacá | 58 | 420 | 7.2 | 385 | 916.7 |
| Caldas | 77 | 106 | 1.4 | 61 | 575.5 |
| Cauca | 208 | 255 | 1.2 | 250 | 930.4 |
| Cundinamarca | 9 | 22 | 2.4 | 23 | 1,045.5 |
| Huila | 548 | 603 | 1.1 | 382 | 633.5 |
| Magdalena | 480 | 684 | 1.4 | 972 | 1,421.1 |
| Nariño | 137 | 593 | 4.3 | 519 | 875.2 |
| Norte de Santander | 219 | 264 | 1.2 | 176 | 666.7 |
| Santander | 2,232 | 15,521 | 7.0 | 11,430 | 736.6 |
| Tolima | 1,099 | 2,387 | 2.2 | 2,906 | 1,218.4 |
| Valle | 2,950 | 3,323 | 1.1 | 2,439 | 734.0 |
| Intendencias: | | | | | |
| Chocó | 26 | 7 | .3 | 4 | 571.4 |
| Meta | 44 | 42 | 1.0 | 42 | 1,000 |
| Comisaría del Caquetá | 52 | 418 | 8.0 | 361 | 863.6 |
| Total | 13,263 | 37,282 | 2.8 | 32,691 | 877.0 |

Contraloría General de la República de Colombia (7).

TABLE 56.—Acreage, production, and yield of figue in Colombia, 1934-40

| Administrative division | Area cultivated | | Production | | |
|-------------------------|-----------------|--------------|---------------------|--------------------|---------------------|
| | 1934 | 1940 | 1934 | 1934 | 1940 |
| | <i>Acres</i> | <i>Acres</i> | <i>1,000 pounds</i> | <i>1,000 sacks</i> | <i>1,000 pounds</i> |
| Antioquia | 6,392 | 9,415 | 3,109 | 1,658 | 7,899 |
| Atlántico | | | | | |
| Bolívar | | | | | |
| Boyacá | 5,668 | 4,532 | 2,755 | 7 | 2,399 |
| Caldas | 1,853 | 351 | 901 | 437 | 233 |
| Cauca | 2,805 | 3,027 | 1,364 | 75 | 1,092 |
| Cundinamarca | 3,173 | 10,932 | 1,543 | (1) | 4,284 |
| Huila | 237 | 136 | 115 | 1 | 124 |
| Magdalena | 1,025 | 771 | 499 | 5 | 992 |
| Nariño | 1,134 | 2,595 | 551 | 571 | 1,449 |
| Norte de Santander | 1,569 | 2,595 | 703 | 198 | |
| Santander | 21,535 | 13,682 | 10,472 | 5,000 | 8,990 |
| Tolima | 156 | 477 | 76 | 1 | 917 |
| Valle | 67 | | 32 | | |
| Intendencia del Meta | 15 | | 8 | | |
| Vichada | 2 | | 1 | | |
| Total | 45,629 | 45,946 | 22,189 | 7,953 | 28,379 |

¹ No data available.

Ministerio de la Economía Nacional de Colombia (12).

TABLE 57.—Exports of major products from Colombia in percentage of total value, 1906-40

| Year | Coffee | Gold | Petroleum | Bananas | Cattle hides | Platinum | Tobacco | Rubber | Straw hats | Tagua | Cacao | Other |
|-------------------|--------|------|-----------|---------|--------------|----------|---------|--------|------------|-------|-------|-------|
| | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. | Pct. |
| 1906 | 42.3 | 20.5 | | 3.3 | 8.6 | 0.8 | 4.6 | 3.1 | 2.8 | 1.3 | 0.8 | 11.9 |
| 1907 | 35.6 | 19.5 | | 4.7 | 7.7 | 1.2 | 3.5 | 4.2 | 3.8 | 1.7 | 1.9 | 16.2 |
| 1908 | 37.5 | 26.3 | | 5.2 | 8.2 | .8 | 2.4 | 1.8 | 2.2 | 1.2 | 1.7 | 12.7 |
| 1909 | 40.1 | 17.7 | | 7.8 | 9.7 | 1.0 | 2.7 | 2.4 | 5.3 | 3.0 | 1.5 | 8.8 |
| 1910 | 31.0 | 18.9 | | 9.4 | 10.4 | 1.5 | 2.1 | 4.7 | 5.5 | 4.4 | | 11.5 |
| 1911 | 42.3 | 16.8 | | 0.7 | 8.0 | 1.1 | 1.5 | 4.0 | 4.9 | 3.3 | .6 | 7.8 |
| 1912 | 52.1 | 20.6 | | 6.2 | 8.3 | 1.8 | 1.4 | 2.3 | 3.6 | 2.3 | .1 | 1.3 |
| 1913 | 53.5 | 12.0 | | 8.9 | 9.3 | 1.7 | 2.7 | 1.1 | 2.8 | 2.4 | .2 | 5.4 |
| 1914 | 49.3 | 14.5 | | 9.2 | 8.3 | 1.6 | 1.2 | .5 | 4.2 | 1.0 | | 10.2 |
| 1915 | 51.4 | 17.3 | | 6.3 | 11.7 | 1.7 | 1.1 | .8 | 3.1 | 1.1 | .4 | 5.1 |
| 1916 | 53.7 | 14.8 | | 4.4 | 11.1 | 4.5 | 1.0 | 1.3 | 2.4 | 1.3 | .1 | 5.4 |
| 1917 | 42.7 | 12.5 | | 7.3 | 16.8 | 5.5 | 1.7 | 2.0 | 2.5 | .8 | (1) | 8.2 |
| 1918 | 55.2 | 6.7 | | 6.5 | 8.0 | 7.0 | 2.7 | 2.0 | 1.8 | 1.0 | (1) | 9.1 |
| 1919 | 68.7 | .4 | | 2.8 | 10.9 | 4.4 | 2.2 | .2 | 1.3 | .8 | (1) | 8.3 |
| 1920 ² | 51.2 | | | | | | | | | | | |
| 1921 ² | 66.5 | | | | | | | | | | | |
| 1922 | 68.8 | 10.0 | | 6.8 | 4.7 | 4.0 | .5 | .2 | .5 | .4 | | 4.1 |
| 1923 | 74.8 | 7.0 | | 6.1 | 4.4 | 6.0 | .4 | .1 | .6 | .4 | (1) | .2 |
| 1924 | 79.8 | 2.2 | | 5.2 | 3.4 | 4.6 | .3 | .1 | .4 | .6 | | 3.4 |
| 1925 | 78.4 | 1.9 | | 6.6 | 3.8 | 4.7 | .4 | .4 | .3 | 1.1 | (1) | 2.4 |
| 1926 | 76.9 | 1.4 | 8.4 | 4.7 | 2.4 | 3.9 | .3 | .1 | .5 | .4 | | 1.0 |
| 1927 | 65.1 | 1.3 | 20.5 | 5.0 | 2.9 | 3.0 | .4 | .1 | .3 | .2 | | 1.2 |
| 1928 | 66.0 | .8 | 19.3 | 6.5 | 2.7 | 2.5 | .2 | (1) | (1) | .2 | (1) | 1.8 |
| 1929 | 60.6 | 4.1 | 21.3 | 7.0 | 3.0 | 2.1 | .2 | (1) | .1 | .2 | | 1.4 |
| 1930 | 54.7 | 8.0 | 23.8 | 7.8 | 3.1 | 1.7 | .2 | (1) | .3 | .1 | (1) | .8 |
| 1931 | 56.3 | 18.3 | 16.2 | 6.0 | 1.7 | 1.3 | .2 | (1) | .5 | (1) | | .5 |
| 1932 | 61.1 | 4.4 | 23.3 | 8.6 | 1.2 | .7 | .1 | (1) | .2 | (1) | (1) | .4 |
| 1933 | 67.1 | 7.9 | 13.5 | 6.7 | 2.0 | 1.7 | .1 | (1) | .1 | (1) | | .9 |
| 1934 | 54.1 | 18.4 | 18.5 | 4.0 | 1.9 | 1.8 | .2 | | .1 | (1) | | 1.0 |
| 1935 | 55.5 | 13.4 | 20.4 | 6.3 | 1.9 | 1.5 | .3 | (1) | .1 | (1) | | .6 |
| 1936 | 58.3 | 17.9 | 17.9 | 5.2 | 2.2 | 2.0 | .2 | (1) | (1) | (1) | | 1.0 |
| 1937 | 53.8 | 17.4 | 19.0 | 3.8 | 2.7 | 1.4 | .2 | (1) | .1 | .1 | | 1.5 |
| 1938 | 54.4 | 11.5 | 22.8 | 5.4 | 2.4 | 1.0 | .6 | (1) | (1) | (1) | | 1.9 |
| 1939 | 49.2 | 22.9 | 18.0 | 4.9 | 2.1 | .6 | .6 | (1) | (1) | (1) | | 1.8 |
| 1940 | 44.5 | 25.1 | 24.0 | 3.4 | .9 | .1 | .3 | (1) | (1) | (1) | | 1.7 |

¹ Less than 0.05 percent.² Data available for coffee only.

Contraloría General de la República de Colombia (5, v. 3, No. 2, p. 19; v. 4, Nos. 1-2).

TABLE 58.—Colombian imports and exports, by value, and index of quantity trade, 1905-40

| Year | Value in Colombian currency of— | | Net ex-ports (+) or im-ports (-) | Ex-change rate per peso | Value in United States currency of— | | Index ¹ of— | | Deflated value ² of— | |
|------|---------------------------------|-------------|----------------------------------|-------------------------|-------------------------------------|---------------|------------------------|---------------|---------------------------------|-------------|
| | Imports | Exports | | | Imports | Exports | Import prices | Export prices | Im-ports | Ex-ports |
| | 1,000 pesos | 1,000 pesos | 1,000 pesos | Cents | 1,000 dollars | 1,000 dollars | | | 1,000 dollars | 1,000 pesos |
| 1905 | 13,755 | 12,316 | -1,440 | | | | | | | |
| 1906 | 11,881 | 14,481 | +2,599 | | | | 37.7 | | | 38,410 |
| 1907 | 13,539 | 14,999 | +1,459 | | | | 38.0 | | | 39,470 |
| 1908 | 15,136 | 14,775 | -361 | | | | 42.6 | | | 34,680 |
| 1909 | 12,452 | 15,829 | +3,377 | | | | 38.3 | | | 41,330 |
| 1910 | 19,471 | 17,787 | -1,684 | 97.09 | 18,904 | 17,269 | 39.8 | | | 44,690 |
| 1911 | 20,282 | 22,376 | +2,094 | 97.09 | 19,702 | 21,725 | 64.5 | | | 34,690 |
| 1912 | 28,546 | 32,222 | +5,381 | 97.09 | 26,059 | 31,284 | 56.4 | | | 57,130 |
| 1913 | 31,960 | 34,315 | +2,355 | 96.64 | 30,886 | 33,162 | 66.8 | 58.7 | 46,236 | 58,460 |
| 1914 | 23,407 | 32,633 | +9,136 | 96.06 | 22,571 | 31,347 | 62.9 | 52.6 | 35,884 | 62,040 |
| 1915 | 19,981 | 31,579 | +11,598 | 93.98 | 18,778 | 29,678 | 65.3 | 47.5 | 28,757 | 66,480 |
| 1916 | 32,219 | 36,007 | +2,787 | 97.06 | 31,272 | 34,948 | 83.8 | 50.0 | 37,317 | 72,010 |
| 1917 | 27,721 | 36,740 | +9,019 | 93.02 | 25,786 | 34,176 | 114.2 | 44.6 | 22,580 | 82,380 |
| 1918 | 24,397 | 37,443 | +13,047 | 105.72 | 28,793 | 39,586 | 135.9 | 57.3 | 18,979 | 65,350 |
| 1919 | 53,146 | 79,011 | +25,865 | 110.59 | 58,774 | 87,378 | 133.9 | 91.6 | 43,894 | 86,260 |
| 1920 | 113,566 | 71,018 | -42,548 | 90.19 | 102,425 | 64,051 | 155.6 | | 65,826 | |
| 1921 | 37,048 | 63,042 | +25,994 | 88.09 | 32,635 | 55,534 | 98.3 | | 33,200 | |
| 1922 | 46,989 | 52,731 | -5,794 | 92.38 | 43,413 | 48,718 | 99.1 | 37.9 | 43,807 | 89,350 |
| 1923 | 67,208 | 60,257 | -6,951 | 95.18 | 63,869 | 57,353 | 106.8 | 65.3 | 59,896 | 92,280 |
| 1924 | 62,251 | 86,166 | +23,914 | 99.17 | 61,734 | 85,451 | 103.4 | 83.6 | 59,704 | 103,670 |
| 1925 | 97,203 | 84,824 | -12,379 | 99.35 | 95,599 | 83,524 | 106.5 | 98.7 | 89,764 | 85,940 |
| 1926 | 123,974 | 111,717 | -12,256 | 98.45 | 122,952 | 109,985 | 100.0 | 100.0 | 122,052 | 111,717 |
| 1927 | 139,166 | 108,999 | -30,167 | 97.69 | 135,951 | 106,481 | 95.3 | 90.2 | 142,655 | 120,841 |
| 1928 | 162,381 | 133,606 | -28,774 | 97.69 | 158,630 | 130,520 | 94.6 | 85.1 | 167,685 | 140,490 |
| 1929 | 141,541 | 126,872 | -14,669 | 98.55 | 136,658 | 122,495 | 93.4 | 85.6 | 146,315 | 148,215 |
| 1930 | 70,382 | 112,709 | +42,327 | 96.49 | 67,912 | 108,753 | 84.1 | 70.8 | 80,751 | 159,194 |
| 1931 | 45,971 | 98,009 | +52,038 | 96.56 | 44,390 | 94,637 | 73.6 | 68.1 | 60,313 | 143,919 |
| 1932 | 34,327 | 70,195 | +35,868 | 95.27 | 32,703 | 66,875 | 65.8 | 58.1 | 49,701 | 120,818 |
| 1933 | 55,526 | 73,391 | +17,864 | 81.69 | 45,442 | 59,953 | 69.5 | 60.8 | 37,646 | 120,709 |
| 1934 | 98,066 | 152,405 | +54,339 | 61.77 | 60,575 | 94,141 | 78.3 | 106.3 | 77,363 | 143,373 |
| 1935 | 119,677 | 142,788 | +23,112 | 56.01 | 67,081 | 79,976 | 78.6 | 104.7 | 85,281 | 136,378 |
| 1936 | 134,441 | 157,632 | +23,191 | 57.08 | 76,739 | 89,976 | 79.3 | 112.3 | 96,770 | 140,367 |
| 1937 | 189,682 | 184,187 | -5,495 | 56.72 | 96,244 | 104,471 | 85.9 | 114.0 | 112,042 | 161,568 |
| 1938 | 159,259 | 163,227 | +3,968 | 55.95 | 89,105 | 91,326 | 80.6 | 109.9 | 119,552 | 148,523 |
| 1939 | 189,461 | 177,064 | -12,397 | 57.06 | 164,683 | 161,083 | 80.9 | 110.3 | 129,398 | 160,529 |
| 1940 | 148,192 | 166,356 | +18,164 | 57.08 | 85,004 | 94,973 | 84.1 | 98.5 | 101,075 | 168,920 |

¹ Index of export prices made up as follows: Unit export prices of coffee, gold, and bananas (constituting over 70 percent of total exports) from 1906 through 1926 were converted to relatives based on 1926 as 100, relatives were weighted according to the importance of the product in the export trade for that period (average), and an index constructed by dividing through by the aggregate weight in 1926. For the period 1926 through 1940, petroleum was added to the export list and the same procedure followed, using as weights for the unit export price the proportion each commodity bore to total exports from 1926 through 1939 (average). These four products accounted for over 90 percent of total exports. Export values in pesos were deflated by this index to obtain a measure of quantity exports.

Index of import prices was made up as follows: United States wholesale price indexes for major import items—textiles, foodstuffs, metals and metal manufactures, and drugs and pharmaceuticals—were weighted according to the importance of these items in the import trade. The period 1912-39 was broken into three periods, 1912-22, 1922-30, and 1930-39, and separate indexes prepared for the three periods, linking them together at 1922 and 1930, necessary adjustment being made in the indexes for the first and third periods to correspond to the second period, which contained the base year, 1926. These items represented 89.2, 77.8, and 69.1 percent of total import values in the three periods. Import values in dollars were deflated by this index to obtain a measure of quantity imports. (Imports from the United States make up the major portion of total imports.)

Contraloría General de la República de Colombia (5); U. S. Department of Commerce (23); and Federal Reserve Board.

TABLE 59.—Principal exports from Colombia, in quantity and value, selected years

| Commodity | 1929 | | 1932 | | 1937 | | 1938 | | 1939 | | 1940 | |
|------------------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | <i>1,000 lb.</i> | <i>1,000 dol.</i> | <i>1,000 lb.</i> | <i>1,000 dol.</i> | <i>1,000 lb.</i> | <i>1,000 dol.</i> | <i>1,000 lb.</i> | <i>1,000 dol.</i> | <i>1,000 lb.</i> | <i>1,000 dol.</i> | <i>1,000 lb.</i> | <i>1,000 dol.</i> |
| Coffee ¹ | 2,836 | 74,234 | 3,184 | 40,880 | 4,060 | 56,250 | 4,262 | 49,670 | 3,774 | 49,714 | 4,443 | 42,252 |
| Petroleum ² | 18,479 | 26,141 | 15,855 | 15,561 | 17,743 | 19,897 | 18,453 | 20,817 | 19,422 | 18,204 | 22,476 | 22,786 |
| Gold..... | | 5,039 | | 3,072 | | 18,161 | | 10,507 | | 23,156 | | 23,881 |
| Bananas..... | 507,768 | 8,545 | 298,834 | 5,723 | 337,683 | 3,961 | 430,428 | 4,971 | 405,847 | 4,952 | 282,599 | 3,202 |
| Divi-divi..... | 1,944 | 27 | 518 | 2 | 11,702 | 175 | 6,067 | 74 | 6,993 | 70 | 1,091 | 7 |
| Balata..... | 260 | 62 | 168 | 23 | 170 | 34 | 137 | 27 | 201 | 50 | 77 | 23 |
| Balsam..... | 143 | 79 | 104 | 77 | 262 | 94 | 101 | 34 | 157 | 52 | 251 | 90 |
| Tagua..... | 12,121 | 199 | 2,352 | 21 | 8,148 | 88 | 3,172 | 25 | 3,283 | 24 | 981 | 7 |
| Straw hats..... | 68 | 174 | 62 | 131 | 55 | 81 | 15 | 27 | 13 | 21 | 4 | 6 |
| Tobacco..... | 2,143 | 226 | 1,805 | 74 | 4,581 | 227 | 11,060 | 575 | 8,832 | 493 | 3,040 | 183 |
| Cattle hides..... | 16,202 | 3,743 | 12,363 | 800 | 16,991 | 2,855 | 15,445 | 2,169 | 13,353 | 2,076 | 8,858 | 842 |
| Others..... | | 4,026 | | 511 | | 2,648 | | 2,430 | | 2,221 | | 1,685 |
| Total..... | | 122,495 | | 66,875 | | 104,471 | | 91,326 | | 101,033 | | 94,973 |
| Total, excluding gold..... | | 117,456 | | 63,803 | | 86,310 | | 80,819 | | 77,877 | | 71,092 |

¹ 1,000 sacks.² 1,000 barrels.

TABLE 60.—Exports from Colombia, by countries of destination, in percentage of total value, 1912-40¹

| Year | United States | Germany | Canada | France | United Kingdom | Netherlands | Panama | Netherlands West Indies | Spain | Others |
|------|---------------|---------|---------|---------|----------------|-------------|---------|-------------------------|---------|---------|
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| 1912 | 49.1 | 5.8 | | | 13.5 | | | | | 31.6 |
| 1913 | 53.0 | 9.4 | | 2.3 | 16.2 | | | | | 17.1 |
| 1914 | 56.0 | 5.5 | | | 18.0 | | | | | 20.5 |
| 1915 | 69.5 | | | | 11.7 | | | | | 18.8 |
| 1916 | 86.2 | | | | 2.1 | | | | | 11.7 |
| 1917 | 81.5 | | | | 1.3 | | 3.1 | | | 14.1 |
| 1918 | 82.5 | | | 2.1 | .8 | | 4.4 | | | 10.2 |
| 1919 | 72.7 | | | 3.0 | 3.4 | | 4.1 | 2.7 | 3.4 | 10.7 |
| 1920 | | | | | | | | | | |
| 1921 | | | | | | | | | | |
| 1922 | 77.5 | .7 | | | 7.5 | | | | | 14.3 |
| 1923 | 85.0 | .7 | | | 4.4 | 2.5 | | | | 7.4 |
| 1924 | 80.2 | 1.0 | | | 3.8 | 3.3 | | | | 11.7 |
| 1925 | 82.1 | 1.6 | | | 3.8 | 4.6 | | | | 7.9 |
| 1926 | 85.9 | 1.2 | | | 3.8 | 2.5 | | | | 6.6 |
| 1927 | 83.0 | 2.6 | | | 5.2 | 2.1 | | | | 7.1 |
| 1928 | 77.7 | 2.1 | 1.9 | | 6.3 | 3.5 | | | | 8.5 |
| 1929 | 75.2 | 2.1 | 4.7 | | 4.8 | 4.6 | | | | 8.6 |
| 1930 | 79.7 | 3.6 | 4.1 | | 3.2 | 4.9 | | | | 4.5 |
| 1931 | 80.2 | 3.4 | 5.5 | | 2.6 | 3.6 | | | | 4.7 |
| 1932 | 75.9 | 4.3 | 4.7 | 3.0 | 1.2 | 3.8 | | | | 7.1 |
| 1933 | 72.6 | 5.0 | 5.8 | 4.2 | 3.0 | 4.5 | | | | 4.9 |
| 1934 | 65.6 | 5.6 | 6.8 | 7.0 | 2.3 | 3.1 | | 6.2 | | 3.4 |
| 1935 | 60.4 | 11.9 | 5.8 | 6.3 | 1.6 | 2.3 | | 11.0 | | .7 |
| 1936 | 54.3 | 16.6 | 5.9 | 4.6 | 1.7 | | | 11.0 | | 5.9 |
| 1937 | 56.6 | 12.3 | 6.7 | 4.9 | .5 | | | 12.2 | | 6.8 |
| 1938 | 52.7 | 14.6 | 9.8 | 4.6 | .5 | | | 11.7 | | 6.1 |
| 1939 | 57.0 | 9.5 | 9.1 | 4.1 | 1.8 | 2.5 | | 10.5 | | 5.5 |
| 1940 | 69.8 | .1 | 11.3 | 3.1 | 1.9 | | | 7.8 | | 6.0 |

¹ Exports representing less than 2 percent of total value are not included except for four countries appearing on figure 42. Country break-downs are not available for 1920 and 1921.

Pan American Union (23); Contraloría General de la República de Colombia (5).

TABLE 61.—Imports into Colombia of principal products, 1935-40

VALUE

| Item | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | <i>1,000 dol.</i> | <i>1,000 dol.</i> | <i>1,000 dol.</i> | <i>1,000 dol.</i> | <i>1,000 dol.</i> | <i>1,000 dol.</i> |
| Agricultural food products, total..... | 1,395 | 2,216 | 2,674 | 2,522 | 3,954 | 2,682 |
| Wheat..... | 498 | 634 | 939 | 867 | 1,271 | 1,087 |
| Rice..... | 428 | 538 | 744 | 707 | 1,236 | 567 |
| Cacao..... | 208 | 650 | 435 | 347 | 573 | 348 |
| Agricultural raw materials, total..... | 2,231 | 2,387 | 3,109 | 2,365 | 3,081 | 3,489 |
| Raw cotton..... | 1,085 | 781 | 1,120 | 1,095 | 1,601 | 2,077 |
| Copra..... | 500 | 553 | 961 | 473 | 527 | 499 |
| Animal products, total..... | 463 | 849 | 797 | 845 | 2,207 | 1,339 |
| Lard..... | 4 | 94 | 18 | 102 | 1,315 | 763 |
| Forest products..... | 375 | 412 | 621 | 644 | 645 | 701 |
| Mineral products..... | 142 | 110 | 160 | 171 | 173 | 205 |
| Manufactured products, total..... | 54,568 | 62,119 | 88,763 | 82,443 | 94,359 | 76,053 |
| Chemical products..... | 7,051 | 13,762 | 20,530 | 17,913 | 21,879 | 19,788 |
| Metals..... | 7,849 | 9,598 | 14,080 | 16,007 | 15,921 | 13,358 |
| Food products..... | 1,003 | 1,598 | 2,314 | 1,563 | 2,180 | 2,121 |
| Sugar, refined..... | 295 | 703 | 807 | 105 | 379 | 723 |
| Textiles and yarn..... | 17,252 | 18,443 | 23,765 | 17,111 | 20,425 | 12,356 |
| Machinery..... | 8,739 | 9,788 | 16,485 | 16,339 | 18,342 | 16,831 |
| Transportation equipment..... | 3,350 | 4,597 | 6,921 | 6,488 | 9,321 | 6,212 |
| Others..... | 675 | 424 | 120 | 111 | 163 | 120 |
| Total..... | 159,849 | 168,517 | 96,244 | 89,101 | 104,672 | 84,589 |

QUANTITY

| | | | | | | | |
|---------------------|-----------------|--------|--------|--------|--------|--------|--------|
| Wheat..... | 1,000 bushels.. | 483 | 587 | 540 | 533 | 1,258 | 932 |
| Rice..... | 1,000 bushels.. | 20,986 | 26,535 | 25,635 | 26,043 | 48,982 | 20,822 |
| Sugar, refined..... | short tons.. | 9,010 | 23,534 | 20,698 | 2,700 | 6,099 | 16,491 |
| Lard..... | 1,000 pounds.. | 22 | 789 | 130 | 1,960 | 15,647 | 10,115 |
| Copra..... | 1,000 pounds.. | 16,867 | 22,505 | 21,164 | 12,754 | 17,178 | 14,711 |
| Cacao..... | 1,000 pounds.. | 5,099 | 9,233 | 4,116 | 5,611 | 10,062 | 5,763 |
| Raw cotton..... | bales.. | 16,817 | 11,702 | 15,155 | 20,515 | 30,998 | 37,755 |

¹ Values for 1935 and 1936 do not include shipping charges, commission, insurance, etc., 1937-40 value are c. i. f. port of receipt.

Anuario de Comercio Exterior de Colombia (6).

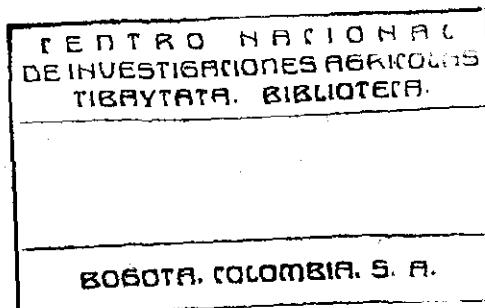


TABLE 62.—Selected imports into Colombia in percentage of total value, 1912-40¹

| Year | Textiles | Food-stuffs | Metals and metal manufactures | Agricultural, mining, and industrial machinery | Drugs and pharmaceuticals | Transportation equipment | Paper and cardboard | Glass-ware and earthenware | Others |
|-------------------|----------|-------------|-------------------------------|--|---------------------------|--------------------------|---------------------|----------------------------|---------|
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| 1912 | 44.0 | 12.7 | 12.2 | 1.6 | 3.5 | 4.3 | 2.0 | 2.1 | 17.6 |
| 1913 | 40.1 | 9.9 | 11.1 | 1.7 | 3.3 | 4.1 | 1.9 | 1.8 | 26.1 |
| 1914 | 32.3 | 9.4 | 12.7 | 4.3 | 3.7 | 4.9 | 2.7 | 2.4 | 27.6 |
| 1915 | 36.5 | 12.9 | 8.0 | 5.0 | 4.6 | 3.7 | 2.8 | 1.4 | 25.1 |
| 1916 | 45.4 | 8.2 | 7.6 | 2.8 | 4.5 | 1.8 | 3.1 | 1.7 | 24.9 |
| 1918 | 43.5 | 4.0 | 10.5 | 3.9 | 4.5 | 3.2 | 3.2 | 2.3 | 24.9 |
| 1919 | 33.8 | 7.4 | 8.4 | 2.4 | 4.3 | 2.9 | 2.7 | 1.7 | 36.4 |
| 1922 | 37.5 | 7.3 | 9.9 | 6.2 | 4.1 | 5.9 | 3.4 | 2.8 | 22.9 |
| 1923 | 38.9 | 8.0 | 12.0 | 6.3 | 3.5 | 4.3 | 3.2 | 2.9 | 20.9 |
| 1924 | 35.2 | 10.3 | 10.8 | 7.0 | 3.8 | 5.9 | 3.2 | 2.7 | 21.1 |
| 1925 | 36.1 | 8.7 | 12.7 | 10.0 | 3.6 | 6.1 | 3.6 | 2.5 | 17.7 |
| 1926 | 33.9 | 11.5 | 10.7 | 8.9 | 3.5 | 7.3 | 4.0 | 4.0 | 16.2 |
| 1927 | 30.5 | 9.7 | 11.6 | 8.8 | 3.9 | 10.2 | 3.0 | 3.2 | 19.1 |
| 1928 | 26.7 | 13.3 | 13.1 | 8.4 | 3.6 | 12.3 | 3.3 | 3.2 | 16.1 |
| 1929 | 27.3 | 14.4 | 9.9 | 8.7 | 4.2 | 8.5 | 3.6 | 3.2 | 20.2 |
| 1930 | 25.1 | 20.6 | 9.5 | 7.4 | 4.9 | 5.8 | 4.0 | 2.9 | 19.8 |
| 1932 | 34.3 | 6.0 | 12.2 | 8.1 | 6.9 | 3.4 | 3.4 | 2.4 | 23.3 |
| 1933 | 34.6 | 3.7 | 12.2 | 8.2 | 7.6 | 4.1 | 3.1 | 1.6 | 24.9 |
| 1934 | 30.0 | 4.7 | 12.4 | 8.4 | 6.4 | 5.2 | 3.3 | 1.7 | 27.9 |
| 1935 | 25.5 | 4.2 | 13.1 | 14.6 | 7.0 | 5.6 | 2.6 | 2.5 | 24.8 |
| 1936 | 23.6 | 5.5 | 14.5 | 14.3 | 7.7 | 6.7 | 2.6 | 2.8 | 22.3 |
| 1937 | 21.1 | 5.2 | 14.6 | 17.1 | 7.8 | 7.2 | 2.9 | 2.7 | 21.4 |
| 1938 | 20.5 | 4.6 | 18.1 | 18.3 | 7.6 | 7.3 | 3.2 | 3.4 | 17.0 |
| 1939 | 21.0 | 6.4 | 15.2 | 17.5 | 7.8 | 8.9 | 2.5 | 1.8 | 18.9 |
| 1940 ² | 16.6 | 7.0 | 15.6 | 11.3 | 8.9 | 7.1 | 3.4 | 2.3 | 25.3 |

¹ Classifications of groups may not be strictly comparable from year to year but are sufficiently accurate to indicate the trends.

² Percentages based on 11 months.

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Fig. 63.—Imports into Colombia by country of origin, in percentage of total value, 1912-40¹

| Year | United States | Germany | United Kingdom | France | Spain | Italy | Netherlands | Belgium | Japan | Others |
|-------------------|---------------|---------|----------------|---------|---------|---------|-------------|---------|---------|---------|
| | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| 1912 | 31.8 | 17.5 | 32.7 | 8.4 | 2.0 | 2.5 | | 2.4 | | 2.7 |
| 1913 | 26.7 | 14.0 | 20.5 | 15.4 | | 2.5 | | | | 20.9 |
| 1914 | 30.9 | 12.3 | 30.2 | 6.0 | 2.7 | 3.0 | | | | 14.9 |
| 1915 | 46.0 | | 30.1 | 2.7 | 2.9 | 2.6 | | | | 15.7 |
| 1916 | 50.9 | | 28.6 | 3.3 | 3.7 | | | | | 13.5 |
| 1917 | 36.3 | | 23.0 | 1.5 | 3.8 | | | | | 15.4 |
| 1918 | 51.6 | | 26.1 | 1.0 | 6.6 | | | | | 14.7 |
| 1919 | 60.9 | | 14.7 | 1.5 | 2.1 | | | | | 20.8 |
| 1920 ² | | | | | | | | | | |
| 1921 ² | | | | | | | | | | |
| 1922 | 47.5 | 5.8 | 21.9 | 4.1 | 2.5 | 2.9 | | | | 15.3 |
| 1923 | 45.3 | 8.5 | 26.8 | 4.4 | 2.5 | 6.2 | 2.3 | | | 4.0 |
| 1924 | 46.1 | 8.3 | 19.8 | 4.2 | | 2.9 | 2.5 | | | 14.1 |
| 1925 | 47.5 | 9.2 | 21.4 | 3.9 | 2.1 | 3.4 | 2.3 | 2.1 | | 8.0 |
| 1926 | 47.9 | 12.8 | 16.6 | 6.1 | 2.0 | 3.6 | 2.4 | 3.4 | | 5.3 |
| 1927 | 44.9 | 13.9 | 15.0 | 7.1 | 2.0 | 3.7 | 2.7 | 4.8 | | 5.9 |
| 1928 | 44.6 | 15.6 | 12.6 | 6.1 | | 2.8 | 2.4 | 5.4 | | 10.5 |
| 1929 | 45.9 | 14.4 | 14.4 | 5.6 | | 3.2 | 2.4 | 4.1 | | 10.0 |
| 1930 | 45.4 | 12.9 | 12.4 | 5.4 | | 2.6 | 4.7 | 4.6 | | 12.0 |
| 1931 | 41.9 | 12.5 | 16.1 | 5.3 | 2.0 | 3.4 | 4.2 | 4.2 | | 10.4 |
| 1932 | 42.0 | 15.3 | 19.9 | 4.7 | 2.1 | 2.3 | 2.9 | | | 10.8 |
| 1933 | 36.8 | 17.8 | 21.8 | 4.9 | | 2.9 | | 2.3 | 4.4 | 9.1 |
| 1934 | 43.9 | 15.0 | 17.4 | 4.0 | | 2.7 | | 2.1 | 4.8 | 10.1 |
| 1935 | 41.4 | 18.7 | 16.7 | 4.0 | | 2.5 | | | 5.5 | 11.2 |
| 1936 | 41.3 | 22.2 | 18.8 | 3.1 | | | 2.0 | | | 12.6 |
| 1937 | 48.4 | 13.4 | 18.8 | 3.1 | | | 2.7 | | | 13.6 |
| 1938 | 51.2 | 17.3 | 12.3 | 3.4 | | | 2.8 | | | 13.0 |
| 1939 | 55.7 | 12.8 | 10.5 | 2.9 | | 2.2 | 2.6 | | | 13.3 |
| 1940 | 74.3 | 0.8 | 7.6 | 1.9 | | | | | | 16.4 |

¹ Imports representing less than 2 percent of total value have not been included, except for the four countries appearing on figure 45.

² Data by countries not available.

³ Includes Ecuador, 2.6.

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