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# The Agricultural Economy of ALGERIA

By Henrietta M. Holm

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Foreign Agricultural Service

UNITED STATES DEPARTMENT OF AGRICULTURE



## NOTES ON ALGERIA

✓ Area ..... Sq. mi.  
850,000

Percentage distribution:

	<u>Percent</u>
Agricultural land .....	21.5
Arable .....	3.2
Grazing .....	18.1
In buildings, roads, etc. ....	.2
Forests.....	1.4
Desert, wasteland, mountains, urban areas .....	77.1

✓ Population: 10 million (1958) persons. Roughly 90 percent are Arabs and Berbers, among whom the excess of live births over deaths averages 250,000 a year. For simplification, these groups are referred to as Muslims throughout the text of this bulletin.

The non-Muslim, or European, sector is principally of French descent, with minorities of Spanish, Italian, Maltese, other varied national origins, and naturalized Algerian Jews.

✓ Population density: In ratio to total area, 12 persons per square mile; to arable land, 385; to total agricultural area, 55.

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# THE AGRICULTURAL ECONOMY OF ALGERIA

by

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## SUMMARY

Algeria is primarily an agricultural country. Its economy is extremely sensitive to annual fluctuations in the produce of the land; about 80 percent of the people are directly supported by rural enterprises, and their production normally provides more than a third of Algeria's gross wealth. Most of the country's industries are concerned with the processing of farm goods, and these, along with transportation and distribution of agricultural products, contribute importantly to the national economy.

Prominent among factors militating against a stable agricultural economy are (1) Capricious climatic conditions in the cultivated areas, resulting in great variations from year to year in crop returns and the welfare of the livestock industry; and (2) a widening breach between the level of production, even in seasons of average output, and the rapidly mounting Muslim birth rate. Per capita share of the area in crops is now about three-fifths of an acre. With an impressive percentage of this land still farmed by primitive methods, indigenous production cannot fully meet the national need.

All, or nearly all, supplies of coffee, tea, sugar, manufactured goods, machinery, and transport material, and part of Algeria's requirements in meat, dairy products, grains, vegetable oils, coal, chemical products, wood, paper products, and metals must now be purchased abroad. The country may be a large exporter of grains, or heavily dependent on imports, from one year to the next.

There is not enough potentially arable land remaining in Algeria to equate demand and supply by simply expanding cropland. Possibilities for new development are limited to about 250,000 acres; irrigation offers, additionally, more efficient use of less than half that amount. If a balanced farm economy is to be achieved, the presently arable area must be more effectively used--by restoration of eroded soils, modification of traditional landholding systems, modernization of archaic farming practices, conservation of grazing zones, and protection of livestock.

Agricultural reforms have been the subject of French consideration since World War II. In consecutive Four Year Plans, begun in 1949, provision has been made for allocating funds to extend and modernize rural property, develop land, reform rural banks, improve the land tenure system, and provide social security for farm labor. But little has been actually accomplished since November 1954, when Algerian nationalists broke into open rebellion against French administration. For more than 3 years now, large areas of the northern departments--Algeria's agricultural heartland-- and the vital transportation network servicing the north have been crippled in varying degrees by the spread of hostilities. It is impossible to estimate what the total cost to the agricultural economy may prove to be before pacification is achieved. With the prior necessity for replacing wartime losses in resources, capital, and equipment, it is doubtful that programs for agricultural development can be given first consideration in immediate post-rebellion planning.

## PHYSIOGRAPHIC INFLUENCES ON ALGERIAN AGRICULTURE

Algerian agriculture is supported by the dual economies of its European sector, with modern farms operated principally as commercial ventures, and its larger Muslim faction, the bulk of which engages in primitive "subsistence" --or, too often, "sub-subsistence" --forms of agriculture. While the sociological differences and varying degrees of technical development of the two groups partly explain the nature of the country's production, the physical peculiarities of this part of the African continent impose its basic limitations.

### Topography

By its physiography, the land decreases in productivity from north to south. Of greatest agricultural interest is the coastal Tell region, which is comprised of three topographic zones.

(1) The littoral band, or the immediate coast and the lower slopes of its hills and mountains. In this area are extensive market gardens and orchards and vineyards. Cereals are grown on alluvial soils.

(2) A zone of plains and valleys, some of which resemble the larger valleys of California. These are heavily planted in vineyards, cereals, citrus and other fruits, and industrial and forage crops. Further inland, intermediate plains and valleys are devoted to olives, grains, and vineyards. Where rainfall permits, the primary culture is cereals in biennial or triennial rotation, as on the "cereal plains"

of the Maalifs, Tiaret-Frenda, Sersou, Setif, and Constantine areas. Summer forage and truck crops are possible, with irrigation.

(3) The mountain elevations of the Tell, which are intensively farmed. In the west, viticulture predominates, other fruits are cultivated, and there are sizable acreages in cereals. Livestock are pastured on mountain plains. To the east, the densely populated Kabyle district lies between the Djurdjura range and the lesser ridges, deep valleys, and gorges which separate these mountains from the sea. Elevations on the Djurdjura's are seldom below 4,000 feet; several peaks exceed 6,500. Wherever any type of agriculture is possible, even the steepest slopes are used. Extensive grasslands and cork forests cover highest elevations, while orchards of figs and olives are found at middle altitudes. At lowest levels, crops are similar to those of the littoral.

The coastal region is crossed by numerous oueds, or streams, entering the sea. These may be without groundwater in summer, but become torrential and seriously erosive with rains of winter and early spring. Only one river, the Cheliff (Oued Cheliff), which rises in the Saharan Atlas Mountains, crosses the Tell to the sea. Although this river is over 400 miles in length and drains an area nearly 7-1/2 million acres, it, too, becomes insignificant in summer. Other Algerian rivers are relatively short, such as the Seybouse, in the east. The Medjerda River (Oued Medjerda), which rises southeast of Guelma, flows principally through Tunisia, crossing to the Mediterranean Sea.

Second in economic importance to the Tell is the tableland which extends at an average elevation of about 2,700 feet between the broken chains of the Tell Atlas (Atlas Tellien) and the Saharan Atlas Mountains (Atlas Saharien). Wedge-shaped, this plateau narrows from a width of 125 miles in Oran as it rolls east, breaking up in the Department of Constantine into a series of small valleys between hills and mountains. At the Tunisian frontier it dwindles to the width of a river valley. From east to west a line of landlocked salt ponds, or Chotts, punctuates the plateaus. These depressions are marshy or, in summer, dry and crusted with salt.

Agriculture on the plateaus is principally confined to the cultivation of cereals, occasional crops of fruits and vegetables at lower elevations, the collection of esparto grass, and grazing in the interior districts of the region. Great numbers of sheep as well as other livestock are pastured on these elevated plains, although the extreme

variation in climatic conditions throughout the year and the scarcity of water necessitate frequent shifting of pastures, often over long distances.

The topography of the Southern Territories is highly diversified. In the north the slopes of the Saharan Atlas range are dominant; to the south, also, are mountains whose peaks are snow-capped in winter. Extensive steppes, broken in the west by smooth-surfaced rock hills, cover much of the Saharan region. Dry stream courses are to be found in many places, and lakes and ponds are common in the southernmost portions. Only about one-ninth of the total area is estimated to be in sand desert. Most of the dunes lie in a semicircular area south of the foothills of the northern mountains.

Oases are scattered through the Southern Territories, in valleys of mountain foothills and on the steppes, as well as in the desert proper. These are particularly frequent in the lower eastern portion of Algeria, in the west Oued Rhir, and in the central districts of the south. While a principal factor in the economy of the oases is the production of subsistence crops of cereals, fruits, and vegetables, so important is the date palm to native culture that the size of an oasis is commonly measured in terms of numbers of date trees, rather than by area or population. Next in agricultural importance are sheep and wool.

### Climate

Algeria's climate roughly coincides with its three major topographic divisions. Particularly in the winter and spring, northwest winds from the Mediterranean bring heaviest rainfall and the highest humidity to the coastal regions. On the lower coast, seasons are "dry and wet," rather than "warm and cold." Because northwestern Algeria is partly sheltered from the winds by the Spanish highlands, there is less rainfall here than in the east. Over the whole, rainfall decreases as moisture from the sea winds diminishes in its passage toward the high plateaus and the mountains bordering the steppes on the south so that these regions are quite arid. Conflicting, always dry, Saharan winds prevail over the desert. The most violent of these, the sirocco, blows sand for days on end, crossing the mountains, the high plateaus, and even into the Tell.

The climate of the littoral is temperate. Frost and snow are rare, and except for the days of sirocco winds, summer heat is relieved by sea breezes. Temperatures become more extreme in the valley-plains zone. Summers are hot in western valleys; as altitude increases to the east, daytime summer temperatures are high, but



nights are often cool. Winter temperatures decrease with elevation. Snow is common in the mountains; the fall in the Djurdjura range often exceeds 3 feet and remains on the ground well into the spring. On the high plateaus, winters are colder, or as cold as those of the highest coastal mountains. Daytime summer temperatures differ little from those of the desert, with daily fluctuations ranging up to 85°F.

Variations in temperature are most pronounced in the desert. The winter-summer range is roughly from 50 to 120 degrees. Away from the mountains, heat is intense both day and night during half of the year, and, except in the far south, winter days are warm but nights are cool. A drop from above 85°F. at noon to below freezing at night is not uncommon.

Algeria's rainfall is characteristically irregular in timing and amount. Most rains are brought by Mediterranean winds, and, although the normal wet season extends from September-October to February-March, its occurrence is rarely constant. Much of the annual fall may be concentrated over a few weeks' time. Rain comes in brief, heavy torrents, eroding mountains, stripping slopes, and flooding stream banks. Because of its sporadic and often violent nature, it limits production in nonirrigated areas to a fair return in only 3 years out of 5.

A difference of 2 degrees latitude from east to west partly explains the uneven distribution of rainfall on the immediate coast. Near Oran on the west the average total is less than half that of the eastern Bone-Bougie sector. At higher elevations of the coastal regions rainfall is generally heavier than on the littoral, the northern slopes of the Djurdjura range receiving about 40 inches a year, most of it in winter. In the steppe region, too, rainfall bears close relation to altitude. From 20 inches in the high Sersou area, the annual fall decreases to from 12 to 16 inches on the northern slopes of the Saharan Atlas, from 8 to 12 inches on the lower steppes, and from 4 to 8 inches in the neighborhood of the Chotts.

Isolated heights of the Sahara have fairly regular rainfall, usually in the form of brief downpours, but most of the vapor from the Mediterranean winds does not penetrate the desert region. Many parts of the Southern Territories have had no rain in several years.

## Soil

The soils of Algeria vary from coarse sands to heavy clays and include large areas of saline soils; however, few types are common to all sections of the country. Heavy red adobe and marly textured soils of the river bottoms are characteristic of the littoral. Salt marshes are occasionally found on the coastal shore, but the total saline land in this zone is low. Soils of the valley-plains are mainly alluvial, but most of the salt soils of the Tell occur here. Soils of the higher elevations of the coastal regions are residual or colluvial at higher elevations, and, in valleys, light, well-drained alluvial waste and gravel washed down from the highlands.

Alluvial deposits from the mountains cover much of the surface of the high plateaus as well. In this region also are sandy loams, loams, heavy clay loams, and, in the most depressed sections, clays. Near the Chotts are extensive spreads of saline soils of natural origin and in dry seasons salt in exploitable quantities covers their basins. Soils of the desert are of little agricultural significance. In the oases, the agricultural potential is determined more by the presence of water than by the soil's fertility. Oasis soils are light textured; sand and sandy loams are most common, although there are some true loams. Gypsum is present in much of the subsoil. Saline soils, containing large amounts of gypsum, chloride, and sodium sulfate are widespread, but by drainage and frequent irrigation, even with strongly saline water, valuable land has been reclaimed for planting of grains, truck, and forage crops. The date palm is highly resistant to salt.

## SOCIAL AND TECHNOLOGICAL FACTORS

### CONTRIBUTING TO THE PRODUCTION PATTERN

#### Land Use

Including land in fallow, Algeria's cultivated acreage approximates only 3 percent of the total land area. With the addition of grazing lands, the total agricultural area covers just over one-fifth of the country.

TABLE 1--Agricultural land: Percentage distribution, by political subdivisions, 1955

Land category	Department of			Southern	Algeria
	Algiers	Oran	Constantine	Territories:	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Cultivated land:					
Cropped .....	14.6	19.0	19.6	( 1/ )	1.8
Fallow .....	8.5	10.8	15.1	( 1/ )	1.1
Total cultivated land ...	23.1	29.8	34.7		2.9
Tree and bush crops .....	3.5	4.5	1.3	( 1/ )	.3
Grazing land <u>2/</u> .....	32.4	22.9	26.6	17.3	18.1
Unproductive agricultural land <u>3/</u> .....	1.9	2.6	1.0	( <u>1/</u> )	.2
Total agricultural area..	60.9	59.8	63.6	17.3	21.5
Forests .....	12.2	12.4	15.2	( 1/ )	1.4
Uncultivated land <u>4/</u> .....	26.9	27.8	21.2	82.6	77.1
Total land area .....	100.0	100.0	100.0	<u>5/</u> 100.0	100.0
	<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>	<u>1,000</u> <u>acres</u>
	13,516	16,642	21,461	493,021	544,820

1/ Negligible.

2/ Includes land in meadow and forage crops, and about 10 million acres in esparto plantations, for which regional breakdown is not available.

3/ Includes land in farm buildings, roads, canals, etc., and waste acreage.

4/ Desert, mountain, wasteland, and urban areas, of which only about 2 percent is potentially cultivable.

5/ Discrepancy in total is accounted for by less than 0.05 percent in forested areas, and other negligible categories.

Although 97 percent of the rural population is Muslim and 94 percent of all farms are Muslim property, more than half of the value of Algeria's agricultural production derives from the holdings of Europeans, on less than a third of the total cultivated land.

Occupying nearly four-fifths of the total land in cultivation, cereals are the country's most important domestic food crops, but output today is not greatly in excess of that at the beginning of the century. Muslim grain growers outnumber the European by nearly three to one (table 2). From the standpoint of income, Algeria's most valuable market crops, including citrus and grapes, are characteristically European; about 90 percent of the citrus groves and an even higher percentage of the vineyards are European enterprises. From the less than 1 million acres of Algeria's best land which is devoted to grapes for wine, about one-third of the national income from agriculture is returned. Production of wine has tripled since 1900, as has that of citrus fruits in the last 20 years. The chief share of the Muslim in these profitable crops has been in the hire of his unskilled labor.

Over nine-tenths of Algeria's sheep and nearly all goats, asses, and camels are Muslim owned, as are over 85 percent of the cattle and about 75 percent of the horse and mule population. Swine are kept exclusively by Europeans. Sheep raising, first in economic importance to the pastoral Muslim community, is again beginning to provide considerable export revenue, but sheep numbers per capita of the rural Muslim population declined by about 45 percent in the 30 years following 1920. The total Algerian flock, as reported for tax purposes, reached a maximum of 9.1 million head of sheep in 1914, compared with 6.4 million reported in the last year of record. Muslim-owned stock depends primarily for feed on the natural range; forage crops are cultivated on only a limited scale, mostly by Europeans and in the irrigated areas. While most of the forage-fed animals can be brought through recurring dry years and severe winters, migratory herds and flocks are decimated in only one season of drought, and the loss in numbers cannot be made up without several years of mild winters and good pasturage.

#### Land Ownership and Tenure, Farm Labor, Size of Farms

Land is commonly held under two broad types of ownership: (1) As the property of individuals or of the tribes (which is estimated to total more than 28 million acres); and (2) as state domain, communal lands, and the public domain (which together total over 23 million acres).

Just over two-fifths of the land in the first category is held under the modern system of land tenure, or is "franchised" land subject to

TABLE 2--Agricultural land: Distribution by ownership, 1955

Crop or land category :	Muslim ownership		European ownership :		Total area
	Area	Percent of total	Area	Percent of total	
	<u>1,000</u> <u>acres</u>	<u>Percent</u>	<u>1,000</u> <u>acres</u>	<u>Percent</u>	<u>1,000</u> <u>acres</u>
Summer cereals 1/ ---	47	76.9	12	23.1	59
Winter cereals 1/-----	6,558	74.5	2,241	25.5	8,799
Legumes-----	200	65.9	104	34.1	304
Vineyards -----	104	10.5	882	89.5	986
Fruit trees -----	418	2/72.6	156	3/27.4	574
Market gardens -----	69	49.6	69	50.4	138
Forage crops -----	47	27.3	128	72.2	175
Industrial crops -----	62	54.5	52	45.5	114
Other crops-----	10	63.2	8	36.8	18
Fallow land -----	4,569	73.1	1,683	26.9	6,252
Natural meadows -----	40	50.8	37	49.2	77
Grazing land -----	97,439	98.6	1,352	1.4	98,791
Unproductive agri- cultural area 4/ -----	656	71.9	257	28.1	913
<b>Total agricultural land -----</b>	<b>110,219</b>	<b>94.0</b>	<b>6,981</b>	<b>6.0</b>	<b>117,200</b>

1/ "Summer cereals" (corn, sorghum, millet, and rice) and "winter cereals" (hard wheat, soft wheat, barley, oats, and rye) are customarily so classified in Algeria to denote the season of each crop's sowing.

2/ Includes about 99 percent of the area in figs and 94 percent of the area in dates.

3/ Includes about 90 percent of the area in citrus fruits.

4/ Land in farm buildings, roads, canals, and waste acreage.

the French Civil Code, while nearly 60 percent is held under one of two traditional Muslim forms of ownership, either as Melk or Arch land. Melk land is privately owned by individuals or by family groups; this may be alienated, but, with obscured titles to ownership and the absence of complete cadastral surveys, its purchase by foreigners becomes most complicated. Melk lands are principally located in the Tell and Kabyle regions. Arch land, which is largely situated on the plains or the high plateaus, is controlled by tribal units. Ownership descends with hereditary rights of tenure to the heads of families, and becomes a nontransferable, inalienable patrimony.

TABLE 3. Division of landed property, 1956

Division	Amount
	<u>Million acres</u>
Land subject to the French Civil Code	12.3
Land held in the Muslim tradition	16.0
Melk land	10.9
Arch land <u>1/</u>	5.1
State domain	11.6
Woods and forests	3.8
Scrub lands	1.8
Ordinary land	6.0
Communal land	10.3
Woods and forests	.6
Scrub lands	2.6
Open country	7.1
Public domain	1.3
Total landed property	51.5

1/ Excluding range lands, for the most part Arch property, shared collectively by the tribe.

As regards land tenure, three objectives have conflicted since the earliest French occupation--the necessity of providing clear-titled land

for European colonization, the desire to prevent undue exploitation of the Muslim landholder, and the eventual aim of replacing Muslim systems of tenure with one similar to that of France. While the French policy has not been one of large-scale expropriation or confiscation and while protective legislation to preserve the inviolability of the properties of both communities has been in effect for more than a century, it is apparent that the French laws governing land settlement were, from the beginning, interpreted in a manner designed to make colonization as attractive as possible. Large grants were made available on an installment basis and much government assistance was given the small homesteading colon. Consequently, Europeans were able to occupy and improve land at a rate with which the Muslim could not compete.

The agrarian reforms introduced in 1956 include a plan for the division of larger estates and the consolidated lands now cultivated by European agricultural corporations, for resettlement by chosen Muslim families. Because of the difficulties of administering the program and rebel objections to Muslim participation in it, and because of the conviction in some circles that the national agricultural output might suffer if transfer of efficiently managed European lands to less experienced Muslim operators were abruptly effected, no appreciable redistribution to small landholders has yet been carried out.

Among Muslims engaged in agricultural activities, the pattern of land tenure is estimated to be as follows:

Total Muslim heads of households in agricultural occupations.....	Thousands	Percent of total
	<u>1,850</u>	<u>100.0</u>
Landowners.....	630	34.1
Tenant farmers.....	150	8.1
Other agricultural workers.....	1,070	57.8

In "other agricultural workers" are included roughly 100,000 permanently employed farm laborers, 90,000 parttime laborers, 230,000 seminomadic stock raisers, and 650,000 family helpers and seasonal workers. In the last-named category are those farmers who customarily leave their own farms for temporary employment by others at the grain and fruit harvesting times.

An old system of sharecropping called Khammasa is widespread in Algeria. Under this form of contract the tenant farmer receives one-fifth of the harvest in return for his labor--additional labor to be hired by him if necessary--and for his domestic service to the landlord, as

required. Land, seed, and equipment are provided by the employer, as, theoretically at least, are varying degrees of social protection-- for instance, housing. Since the sharecropper finds it nearly impossible to avoid continual indebtedness to the landlord, in practice the system approaches serfdom. Classified as a "partner," the Khammes is denied certain state benefits to other agricultural laborers, including minimum wages, insurance, and pensions; in fact, in the past some landlords deliberately entered into the Khammasa contract simply to avoid payment to the government for these forms of employee security. Although the retention by the landlord of more than one-half of the harvest and the contribution by the tenant of more than his own labor have been outlawed since 1956, it is estimated that there are still about 200,000 Khammes in the country today.

Most European farms are operated by their owners, or by a manager. A small percentage of the land is rented out on a sharecropping basis, particularly that in truck crops or tobacco. Some of the grain land is let for simple rents. Of 36,000 European heads of farm households, about 5 percent are sharecroppers; 10 percent rent land; 40 percent are engaged as employees, chiefly in technical capacities or as overseers or foremen; and about 45 percent own their farms.

Field labor is usually performed by Muslims, and, in general, the output per worker is low. There is no shortage of agricultural labor. The problem is one of chronic underemployment which spreads to nonagricultural occupations as well, when farm workers leave rural areas to look for work in the towns.

In the last agricultural census, of 1950-51, there were reported to be slightly over 22,000 European farm operators. It has been estimated that 7 percent of the total European-held farmland is worked by 13,000 farmers in plots averaging 35 acres, that 21 percent is held by 5,000 farmers in average acreage of 380 each, that less than 4,000 people operate more than 70 percent of the European farms, in larger tracts, and that about 900 farmers of this last group hold more than 1,250 acres apiece. The consolidated estates, which are a major target of government land distribution schemes, total some 250,000 acres.

At least 70 percent of Muslim holdings fall in the category of "less than 25 acres." Most farms are well under this figure in area, many are mere garden plots, and group ownership of a single fruit tree is not uncommon in some sections.



## Production Practices

Few Muslims individually own farm machinery; most of that used in Algeria is the property of European farmers, or is owned by the cooperatives or Rural Development Societies. In 1956 there were over 21,000 tractors and more than 4,000 combines in service in the country, or double the number in 1949. Among other agricultural machinery in common use are grain drills, fertilizer spreaders, disc plows, tractor-drawn mouldboard plows and harrows, binders, mowers, and rakes. There is a small domestic manufacture of farm implements and machinery, but most heavy equipment is imported from France and other European countries, or from the United States and Canada.

Hand-hewn, all wooden plows or, at best wooden plows with iron shares are used by the majority of Muslim farmers to prepare the soil for crops. Neither type is capable of deep plowing. Horses, mules, asses, and oxen are the common draft animals. In the Kabyle region, where plows are too unwieldy for the steep slopes, hoes or picks are used to break the soil.

Seed is sown broadcast after the first plowing; with a second turn around the field to provide a shallow seed covering Arab Muslim farmers have completed the cultivation process. Farmers of the Berber tribes are, in general, more industrious. Their fields are usually kept clean; weeds are pulled by hand or hoed and are utilized for forage.

Harvesting is done by hand. Threshing boards are used, or grains are trampled out under the hooves of oxen and winnowed by tossing the grain in the air.

In the dry-farmed cereal regions, the rotation of a winter in grains and up to a year and a half in fallow is common. Europeans in a few districts practice a 3-year rotation of wheat, followed by barley or oats, then fallow. A 4-year rotation of plowed fallow, wheat, cultivated fallow, and secondary cereals is found in some localities.

Muslims usually plow their fallow once in the spring and let it revert to natural growths. Most European farmers practice successive courses of deep plowing, with water conservation, to preserve the soil's moisture. On larger farms the soil is regularly dressed and tilled between one harvest and the next sowing.

Dry legumes are ordinarily grown in rotation with cereals. The proportion of cereal-fallow acreage used is determined by climatic and soil conditions, by the market price, and by the manpower and

equipment available. Since seeding and harvesting for both legumes and cereals are performed during the same period, the two crops compete for land and labor. Vetch, melons, vegetables, or tobacco, followed by two plantings of grain, are satisfactorily rotated where water is sufficient. Under irrigation, crops are planted annually, or follow each other during the year, according to their nature. Broad beans and other legumes are intercropped in olive groves, where soil and water conditions are favorable. Cereals are frequently planted in young olive groves until the trees begin to bear.

Most European farmers and a few Muslims use selected seed, some of which is produced in the country. Although in recent years the areas devoted to seed grain have greatly expanded and the quality of the seed produced has been much improved, less than half of the seed requirements are met locally.

Commercial fertilizers are ordinarily applied by Europeans, and a small increase in their use by Muslims has resulted from recent rural development programs, under which methods of fertilizer employment are taught. Mechanical spreaders are almost universally used. The present annual rate of consumption is about 50,000 tons, over half of which is phosphatic fertilizers, readily obtainable domestically from rich deposits of rock phosphates. The bulk of the nitrate and potassium fertilizers used in the country is imported, principally from France, Germany, and the Benelux countries, since no natural salts or potassium deposits originate in Algeria.

While European farmers use all modern means available for the control of plant pests, most Muslims lack the funds to employ the necessary chemicals and equipment. The annual consumption of pesticides for agricultural purposes is about 28,000 tons. Locusts are a common cause of crop damage. A comprehensive locust control program, designed to destroy these pests in their breeding places, is operative, as in other North African countries.

### Agricultural Organizations

The recently reorganized Algerian Agricultural Service (Direction de l'Agriculture) now consists of four major branches:

- (1). The Administrative and Juridical Division (Sous-Direction Administrative et Juridique), which controls personnel, budget, and credit functions, and has authority over district bureaus and attached agricultural agencies. A division of Social Affairs for supervision of the agrarian reform program is included in this service.

(2). The Commissariat au Paysannat, organized to give impetus to the improvement of Muslim agriculture by provision of technical and operational aid and credit facilities to groups of Muslim farmers.

(3). The Division for Agricultural Commodities (Sous-Direction de la Production Agricole), charged with the maintenance of experimental services, agricultural schools, testing laboratories, and similar customary agricultural services.

(4). The Services of Forests and Soil Conservation (Services des Forets et de la Defense et Restauration des Sols), formerly separate, but now attached to the Department of Agriculture. This agency is responsible for all phases of soil restoration and preservation.

Algeria has systems of agricultural cooperatives and agricultural mutual credit societies, as well as the organizations expressly initiated by the government for the benefit of Muslim farmers. While membership in each is open to all farmers, most Muslims do not affiliate with the cooperatives or the mutual societies, since traditional forms of family or tribal land tenure make it difficult for the individual to furnish statutory surety.

Cooperatives function for the protection of the farmer and to facilitate his purchasing and marketing. As is indicated above, membership is essentially European. In 1956 about 6 percent of the Muslim landowners and tenant farmers were reported as members of the 523 cooperatives of all types in the country at that time. The number of active societies fluctuates.

Provident Societies, or SIP's (Societies Indigenes de Prevoyance), were established before 1900 to improve the Muslim farm economy and to attempt integration of native and European agriculture. By 1945 their functions had become so extensive that subsidiary Rural Development Societies, or SAR's (Secteurs d'Amelioration Rurales), were introduced to function under the supervision of the SIP's in providing more direct help to the local Muslim farmers. Primarily, SAR's disseminated agricultural information among members and encouraged them to adopt modern farming techniques. They act as grain cooperatives also and aid in storage and marketing of other farm products. Through their parent SAP (in 1952, SIP was retitled SAP, or Societies Agricoles de Prevoyance), members may borrow in money or in kind for seed, fertilizer, the payment of debts, the building-up of herds,

TABLE 4.--Agricultural cooperative societies: by number and type, 1938 and 1954

Type	1938	1954
	<u>Number</u>	<u>Number</u>
Cereal cooperatives.....	23	29
Grain warehouses .....	--	10
Purchase and supply cooperatives .....	--	152
Equipment cooperatives .....	101	182
Tobacco cooperatives .....	3	3
Miscellaneous cooperatives <u>1/</u> .....	40	63
Cooperative unions .....	--	9
Cooperative banks .....	167	182
Total .....	334	530

1/ Includes a fruit cooperative, olive processing plants, dairies, flour mills, a cotton cooperative and an artificial insemination cooperative, several cooperatives producing or processing live-stock products, and several distilleries.

planting of orchards and vineyards, the purchase of agricultural equipment, and other things, at reasonable rates of interest. This is a strong factor, since few Muslim farmers have private real property or other resources of a nature acceptable to banks as security. Modern grain elevators, trucks, scales, fruit-drying plants, machinery, breeding stock, and similar facilities are furnished for the community use of SAR members.

In 1955 there were reported to be 220 SAR's, including cereal, arboriculture, stockbreeding, and oasis development sections. While membership is of course predominantly Muslim, since 1953 these organizations have been open to European farmers as well.

In the organization of agricultural credit, there are three institutions: The Algerian Mutual Agricultural Credit Fund, or CACAM (Caisse Algerienne du Credit); the Bank for Farm Loans (Caisse des Prets); and the Central Bank of the SAP, or CCSAP (Caisse Central des SAP), which recently replaced the Common Funds of the SAP (Fonds Communs des SAP). At the end of 1955 there were 161 local banks affiliated with 22 regional federations under a central CACAM (Algerian Mutual Agricultural Credit Fund).

In this type of credit, loans are made only to members who can qualify by purchasing shares of capital and submitting adequate security. This has been of little benefit to the average Muslim farmer, although the CACAM has contributed indirectly to his welfare by loaning considerable sums to the SAP's. For the last 20 years the Bank for Farm Loans has been a primary source of emergency loans for farmers confronted with crop failure, insect damage, earthquakes, and the like. Although about 75 percent of all loans were reportedly made to Muslims, those concluded to date do not represent a significant proportion of total agricultural credit. Fonds Communs des SAP

TABLE 5.--Number of units and membership by location, Societes Agricoles de Prevoyance (SAP) and subsidiary Secteurs d'Amelioration Rurales (SAR), December 1955.

Location	SAP	SAR	Membership
	units	units	
	<u>Number</u>	<u>Number</u>	<u>Thousands</u>
Department of Algiers .....	29	74	147.4
Department of Oran .....	21	59	71.6
Department of Constantine .....	37	66	190.0
Southern Territories .....	18	21	91.4
Total .....	<u>105</u>	<u>220</u>	<u>500.4</u>

attempted to reach the native farmer directly, by granting funds for seed, fertilizer and such, but not for heavy equipment. In the interest of uniformity, Fonds Communs was abolished in 1956, and the Central Bank of the SAP, or CCSAP, modeled on the organization of the Algerian Mutual Agricultural Credit Fund, CACAM, was substituted. At the same time, the Board of Directors of the Bank for Farm Loans was modified to resemble that of CACAM. It is planned that eventually all agricultural credit is to be mutual credit.

While no recent information is available as to total membership, or as to the division of membership between European and Muslim farmers, there are more than 20 regional farm insurance societies affiliated with the Central Insurance Bank, to provide protection against fire, frost damage, and livestock mortality. Relying on the same system, 30 societies have been set up since 1950, under a Central Office of Agricultural Social Insurance with regional branches, to provide agricultural laborers with social insurance. By the plan,

permanent agricultural laborers are guaranteed compensation for illness, disability, dependents' death benefits, maternity aid, and old-age allotments. The system is financed by means of taxes which are supplementary to the land tax and the tax on agricultural property, and by small monthly contributions paid by both employee and employer.

### Pressure of Taxation

Algeria's tax system is based partly on income, at a rate fluctuating with the total figure. Taxes on agricultural industries are collected first on property valuation, which varies with improvements. Another tax is levied on the agricultural enterprise. The property owner pays a further tax on his net income. Taxes on crops are based not only on the area, yield, and type of crop, but on its market value during the year as well. Taxes on fruit trees and vines vary with each kind and its estimated productivity. Livestock taxes are graduated according to the specie and age of the animal.

As part of government support, buildings used by the cooperatives for agricultural purposes are exempt from the tax on improved real estate. Cooperatives are also free from tax on income from commercial and industrial enterprises, and the shares, loans, or any obligations of the cooperative enterprises are exempt from the tax on revenue from personal property. Agricultural mutual credit associations need not pay the tax on industrial and commercial profits, nor is the tax on income from securities applied to the subscribed capital, or to obligations and loans contracted or extended by these organizations.

### Agricultural Education

The National School of Agriculture, part of the Agricultural Institute and its research centers at Maison-Carree, near Algiers, offers a 3-year curriculum comparable to the better agricultural colleges of France. Of about 175 students, half come from France; most of the remainder are Europeans from North African countries. Rarely is a Muslim enrolled.

Four regional secondary schools, at Philippeville, Guelma, Temouchent, and Sidi-bel-Abbes, offer a combination of agricultural theory and practical farm work to about 250 students. Muslims make up about one-third of the student body of the first three schools, which offers 2-year courses, but few attend the Sidi-bel-Abbes school, where 3 years of instruction is given.

Instruction in basic farming practices applicable to their local conditions is mandatory for Muslim primary students. Classes are

taught by both Muslim and European teachers from the Normal School at Bouzareah (Algiers), under the supervision of government specialists. The Algerian Agricultural Service supervises as well several short-term training courses designed to meet regional needs in varied agricultural fields. The Agricultural Institute, with the cooperation of several experiment stations, sponsors limited apprenticeships for more advanced agricultural students.

### Agricultural Research and Extension Services

Agricultural research is carried on, under the broad direction of the Division for Agricultural Commodities, chiefly by the Agricultural Institute of Algeria at Maison-Carree (Algiers); the Service of Experimentation; experiment stations proper; the Service of Plant Protection; the Livestock Service; and by several branches of the Faculty of Science of the University of Algiers. The Service of Forests and Soil Conservation is also charged with research responsibilities, but in all these agencies research is a subordinate function.

Normal extension activities are conducted also by the Division for Agricultural Commodities through its various services, such as Livestock and Plant Protection. While these organizations direct their efforts toward both Muslim and European farmers, the SAR's (under the Commissariat au Paysannat), with technicians, mechanized equipment, and progressive instruction, offer to Muslims the broadest extension facilities.

### Controls on Production and Distribution

Regulations governing the production and distribution of grains are based, as in France, on the law under which the Algerian section of the Cereals Office (Section Algerienne de l'Office National Inter-professionnel des Cereales), or SAONIC, was created in 1936. Under instructions from France, the Governor General of Algeria issues decrees each crop year governing declaration of plantings and harvests, the quantities the producer may withhold from trade, and purchase and sale of grains. Prices are also fixed by decree. SAONIC sets standards for export grains, and there are established tolerances for insect damage. SAONIC has no storage nor infestation specialists, nor have any of the grain cooperatives. Advice is available from various phytosanitary services; most fumigation of grain is done by warehousekeepers.

Wine production and disappearance are strictly regulated. The price of wine is not fixed, but is kept within certain limits, as are prices for French wines. Government regulations for other agricultural products are not static. Price controls are imposed and removed

with the expediency; price incentives are sometimes used to induce farmers to plant a particular crop, or preference in obtaining machinery and equipment may be offered for the same purpose. Export restrictions imposed early in the shipping season may later be removed as stocks increase. The Office Algerienne de l'Action Economique et Touristique (OFALAC) enforces pest control standards for dates, figs, pulses, and a limited number of other commodities of export quality, utilizing an extensive system of official and private vacuum fumigation plants inland and at ports.

### Marketing and Transportation

Algerian marketing cooperatives play a dominant role in the commercialization of agricultural produce, particularly grains, wine, citrus fruits, and tobacco. The first cooperative enterprise in the country was established in 1904 to promote sales of wine in a remote grape-growing district when inefficient transport facilities made the collection of small quantities of wine from widely separated points uneconomic. A few cooperative grain elevators were established later. The Algerian Cereals Office, SAONIC, purchases all cereals not consumed on the farm through grain cooperatives or where cooperatives do not exist, through the Provident Societies (SAP) or through designated merchants at prices fixed by the government. Producers are required to sell only to licensed buyers, who receive a warehousing fee from SAONIC for all grain held in storage. Costs of conservation, including pest control operations, are met by the storekeepers.

SAONIC holds a monopoly on exports of wheat and barley. Most exports of wheat are transfers by SAONIC to the French Cereals Office (ONIC). After inspection in the cooperatives, barley for export is purchased by the Grains Office and sold on tender to private export merchants, who also conduct a limited trade in other cereal products and livestock feed.

For nearly 30 years, three large tabacoops, one for each of the northern Departments, have handled the processing and sale of practically all tobacco produced in Algeria. Usually about half the leaf produced by cooperative members is sold to Algerian cigarette and smoking tobacco manufacturers, and the remainder is exported, principally to France. A sales agreement for the period 1949-58 provides that the Federation of Algerian Manufacturers and the French Tobacco Monopoly will buy most of the leaf obtained by the cooperatives, at prices determined by production costs in Algeria and by the cost of competitive leaf from other sources.



Cooperatives for the commercialization of fruit, particularly citrus fruits, and fruit products have been effective. Almost the entire cotton crop is marketed through cooperatives. Growers of other crops, such as legumes and olives, rely to a much more limited extent on cooperatives for marketing assistance.

Most Muslim farmers are not members of the marketing cooperatives, principally because they lack the means to buy the shares required of members, or because they cannot guarantee continued tenure in a given locality. The Provident Societies (SAP) and their subsidiary Rural Development Sectors (SAR) attempt to facilitate the marketing of crops for this part of the rural population. However, a high percentage of the product of Muslim subsistence-type farms does not reach a commercial market. Any excess over family needs is stored in the native fashion appropriate to the crop, or is bartered locally.

Algeria has about 3,000 miles of normally well-maintained modern railroads, which carry about 98 percent of all freight through the country. The main line parallels the coast from Oujda to Ghardimaou on the Tunisian border, with branches running to the seaports and into the interior. There are nearly 50,000 miles of roads, including some 12,000 miles of highways, for use in the movement of farm produce to collection points and ports. Since the rebellion, however, both rail and highway networks have suffered sabotage from time to time as a result of nationalist efforts to interrupt production and supply.

The main ports--Algiers, Oran, and Bone--have bulk storage facilities, handling equipment for agricultural products, and a plentiful supply of labor. Other smaller ports are Philippeville, Bougie, Beni Saf, Nemours, Arzew, and Djidjelli. French steamship lines have a monopoly on transport between Algeria and metropolitan France. Regular scheduled service is also provided between most West European countries, Tunisia, Morocco, and French West Africa and the east and Gulf coasts of the United States. Because of its high cost, air freight is seldom used for transport of agricultural produce; the ratio of air shipments to sea transport is about 2 to 1,000.

## AGRICULTURAL PRODUCTION

### Main Crops

Algeria's principal crops are wine grapes, cereals, early vegetables, citrus fruits, dry legumes, olives, dates, and figs. Tobacco,

vegetable fibers, sugar beets, and plants for perfume oils are the main industrial crops raised in the country, but these are of secondary importance. While some perceptible changes in production have occurred in the last 2 decades, the basic pattern of production has not been greatly disturbed. Wine grapes have kept the lead; production of olive oil, citrus fruits, dry legumes, and potatoes has more than doubled, and the present high output of market vegetables other than potatoes reflects a response to an expanded market demand in recent years. In contrast, grain production shows only minor gains.

Grapes. -- When the French arrived in Algeria in 1830 the area in vines was only about 5,000 acres, and practically all grapes grown were for consumption either fresh or dried. Vineyards now cover close to a million acres. In the last 25 years, production of wine has averaged between 11 million and 12 million hectoliters, in spite of the fact that during World War II output was seriously curtailed when reduced supplies of fuels and fertilizers were necessarily channeled into the production of priority food crops.

Most extensive vineyards are in the great plains and valleys of the coastal region, but they are also found on mountainsides and even in oases. Advanced methods of viticulture are employed in 90 percent of the vineyards, and these are European-owned. The varieties of wine grapes grown are chiefly those of southern France--Carignane, Cinsault, Grenache, Alicante-Bouschet, Morostel, Mourvedre, Pinot, and Cabernet plantings from which red wines are made, and Clairette, Faranah, Macabeo, and Aligote grapes for white wines.

The export of Algerian wines has become the country's greatest source of agricultural wealth. Under existing agreements a market for about 95 percent of all exports--or about three-fourths of the crop--is provided by France, which neither needs nor particularly wants Algerian wine, except in years when the metropolitan harvest is seriously reduced by bad weather. Some Algerian wines are used for blending with ordinary French wines, but much of the crop is converted to low-grade alcohol at a great financial loss to the French Government.

Cereals: -- Grains provide the largest harvests in the country and the greatest domestic food source;--with mutton, olives, figs, and dates, they form the staple diet of many Algerians. Chief areas of cultivation are in the valleys of coastal mountain ranges and the high plateaus between the Tell Atlas and Saharan Atlas Mountains. Over most of the grain-producing regions the average annual rainfall is less than 20 inches. In localities bordering on the steppes, rainfall is so uncertain that good crops are harvested only once in 5 or 6 years.

TABLE 6.--Vineyards: Area, production of grapes and wine; and net trade in wine; averages 1934-38, 1945-54, and annual 1955-1957.

Period	Area in vineyards :	Production			Net trade in wine <u>1/</u>
		Table grapes	Wine grapes	Wine	
	<u>1,000 acres</u>	<u>1,000 L.tons</u>	<u>1,000 L.tons</u>	<u>...1,000 hectoliters...</u>	
Average:					
1934-38	998	14	2,286	17,879	-12,850
1945-49	885	19	1,139	10,246	-7,624
1950-54	993	25	1,947	15,563	-14,659
Annual:					
1955	986	23	1,783	14,399	-10,174
1956	970	28	2,328	18,631	-12,718
1957 <u>2/</u>	956	( <u>3/</u> )	( <u>3/</u> )	15,318	( <u>3/</u> )

1/ Minus sign denotes excess of exports over imports.

2/ Preliminary.

3/ Not available.

TABLE 7.--Wheat: Area, production, and net trade, averages 1934-48 and 1950-54, annual 1955-57

Period	Hard wheat		Soft wheat		Total		Net Trade <u>1/</u>
	Area	Produc-tion	Area	Produc-tion	Area	Produc-tion	
	<u>1,000 acres</u>	<u>1,000 L.tons</u>	<u>1,000 acres</u>	<u>1,000 L.tons</u>	<u>1,000 acres</u>	<u>1,000 L.tons</u>	<u>1,000 L.tons</u>
Average:							
1934-38	3,108	627	1,065	310	4,173	937	-230
1939-43	2,896	593	1,107	324	4,003	917	-101
1944-48	2,466	415	1,045	201	3,511	616	189
1950-54	3,269	785	1,040	321	4,309	1,106	81
Annual:							
1955	3,793	911	1,233	374	5,026	1,285	-74
1956	3,751	1,072	1,203	440	4,954	1,512	50
1957 <u>2/</u>	3,460	889	1,136	362	4,596	1,281	( <u>3/</u> )

1/ Minus sign denotes excess exports over imports.

2/ Preliminary.

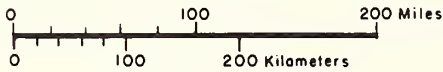
3/ Not available.

ALGERIA

A I N

REFERENCE MAP

- International or intercalonial boundary
- - - International or intercalonial boundary, Indefinite or in dispute
- . - . - Internal administrative boundary
- ⊗ National or calonial capital
- Internal administrative center
- Principal road (selected)
- - - Other matarable route (selected)
- +—+—+ Railroad, standard guage (selected)
- +—+—+ Railroad, narrow guage (selected)
- ▨ Intermittent lake
- ~ Intermittent stream
- ⋯ Erg ( sand dune area)
- ↑ Oasis



36

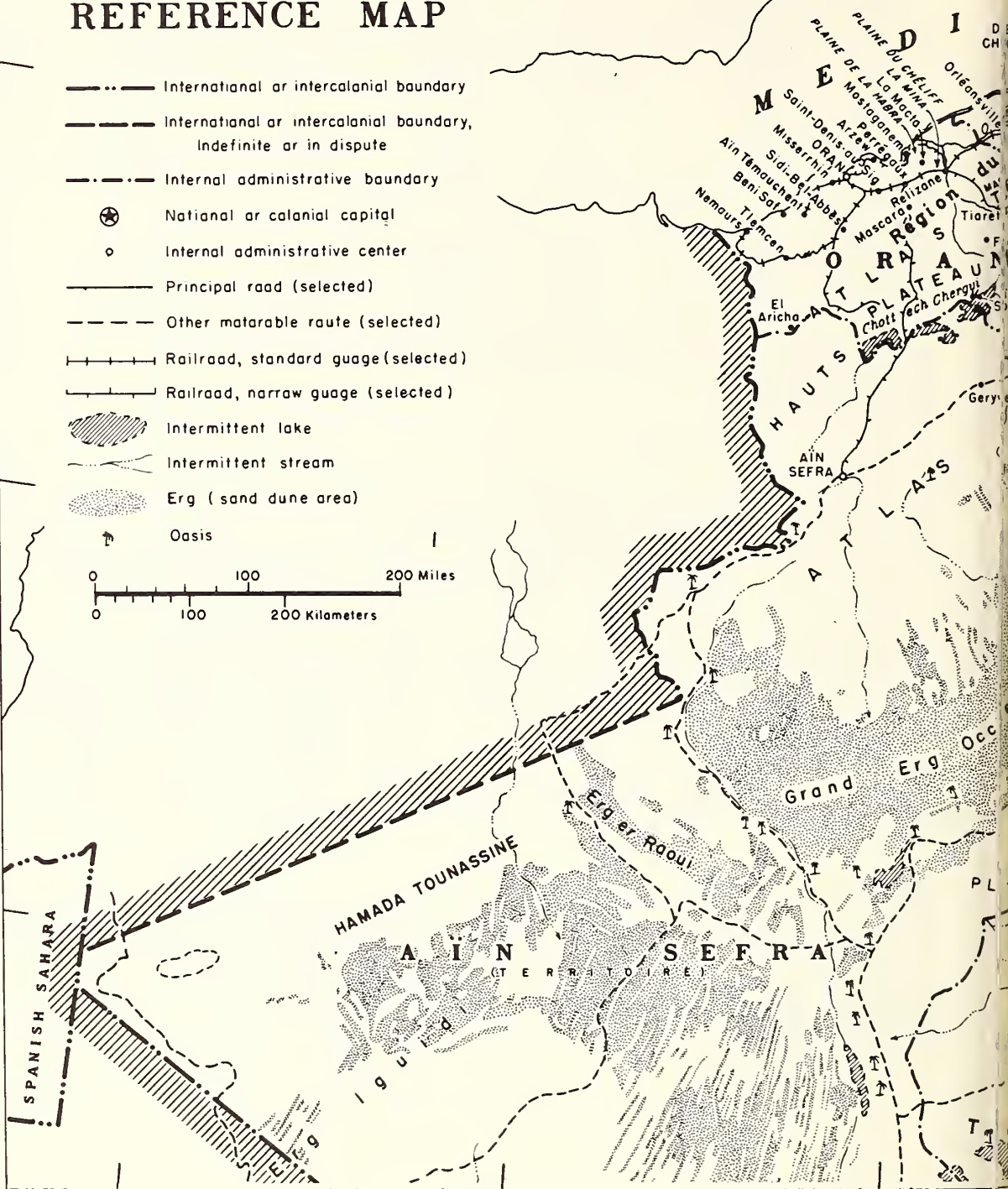
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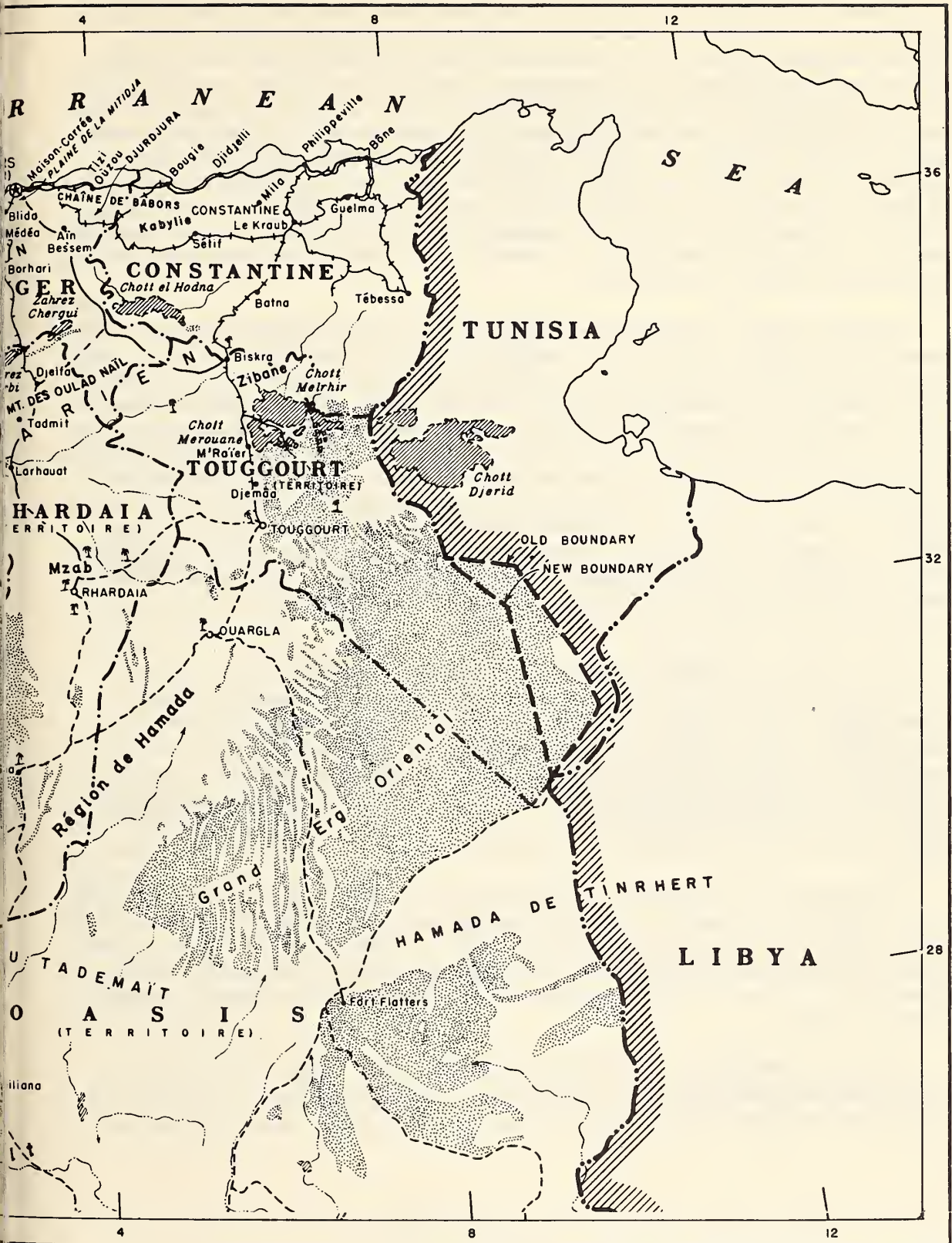
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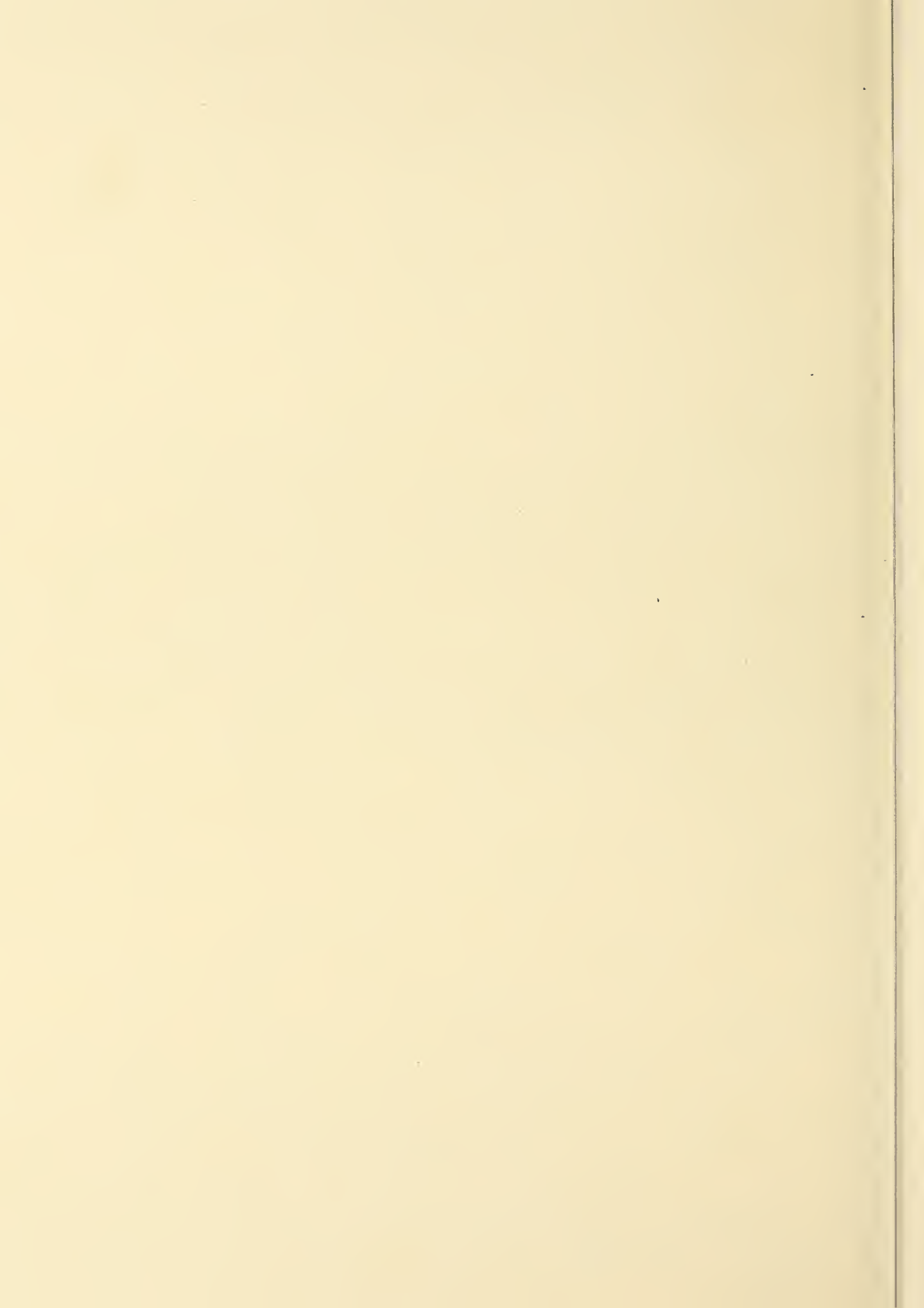
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Hard and soft wheat, barley, and oats are sown in the fall, from October to December, and are harvested from May to July. Hard wheat and barley are cultivated primarily by Muslim farmers, soft wheat and oats largely by Europeans. Horses and mules are the chief motive power used by Muslim growers, where grain farming machinery is not accessible, and holdings are generally small. Most European grain farms are mechanized. Many are large units, with individual farms of from 1,000 to 5,000 acres not uncommon. While the quantity of grains grown each year fluctuates as variations of climate affect yields, in the 3 years 1954-56 annual production of all cereals averaged nearly 2.4 million long tons, of which more than 55 percent was wheat and about 30 percent barley.

Algeria was an exporter of wheat during the 10 years 1934-43, but unusually heavy imports were required in the 5 years following. This was due partly to shortages of farm machinery, fertilizers, and labor, which reduced the acreage planted during World War II and the years immediately following, and partly to adverse weather conditions. The prewar pattern began to be resumed by the early 1950's. Nevertheless, the trend of trade, as reported in table 7, is misleading without the explanation that Algeria does not produce enough soft wheat to meet its needs. The demand has increased sharply with the rapidly growing Muslim population and the current preference for soft wheat food products, rather than the traditional barley. By an arrangement between the French and Algerian Cereals Offices, Algerian hard wheat is customarily exchanged for French soft wheat.

While the importance of barley is declining somewhat as Muslim city dwellers become more accustomed to a diet containing larger quantities of wheat flour and bread, barley is still widely grown for food, for livestock feed, and for export. Nearly all Algerian barleys belong to the Hordeum tetrastichum L. (square) species, but some six-spiked (Hordeum hexastichum) barley and two-spiked (Hordeum distichum) is also found in the country. Square I.A.A.-2 and square Saïda-183, both developed by selected cultivation, are most popular.

Statistics on area and production of the minor grains are regularly available only for oats, corn, and sorghum, but limited amounts of other grains, such as millet and durra, are produced in Algeria, and a little rye is customarily planted in coastal areas as a windbreak in vineyards. About 7,000 tons of rice were produced on nearly 13,000 acres in 1956.

Early Vegetables. -- Algeria's coastal regions are particularly favorable for growing early vegetables. Production has risen steadily since World War II, the supply now exceeding local consumption by a



TABLE 8.--Barley: Area, production, and net trade, averages 1934-48 and 1950-54, annual 1955-57

Period	Area		Production		Net trade <u>1/</u>
	1,000 acres		1,000 L. tons		1,000 L. tons
Average:					
1934-38	3,074		693		-21
1939-43	2,805		646		9
1944-48	2,224		406		4
1950-54	3,131		800		-165
Annual:					
1955	3,450		682		-74
1956	3,420		1,007		-10
1957 <u>2/</u>	3,188		556		<u>(3/)</u>

1/ Minus sign denotes excess of exports over imports.

2/ Preliminary.

3/ Not available.

TABLE 9.--Oats, corn, and sorghum: Area, production, and net trade, averages 1934-38 and 1950-54, annual 1955-57

Period	Oats		Corn		Sorghum		Net trade <u>1/</u>
	Area	Prod.	Area	Prod.	Area	Prod.	
	<u>1,000 acres</u>	<u>1,000 L. tons</u>	<u>1,000 acres</u>	<u>1,000 L. tons</u>	<u>1,000 acres</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>
Average:							
1934-38	457	148	17	4	27	6	3
1950-54	425	128	20	8	32	8	-11
Annual:							
1955	343	91	20	10	35	8	-4
1956	288	95	20	11	35	8	-3
1957 <u>2/</u>	<u>(3/)</u>	69	<u>(3/)</u>	<u>(3/)</u>	<u>(3/)</u>	<u>(3/)</u>	<u>(3/)</u>

1/ Minus sign denotes excess of exports over imports.

2/ Preliminary.

3/ Not available.

large margin. Truck crops and potatoes rank third in Algeria's agricultural export trade. The bulk of the produce goes to France or to other European markets.

Two annual crops of potatoes account for about half the acreage in vegetables. A high proportion of the winter crop, grown mostly under irrigation on the littoral, is exported; summer potatoes, grown on the plateaus, are consumed locally. Artichokes and tomatoes represent an additional 25 percent of the total vegetable area. Carrots, which are gaining in importance as an export crop, and fresh peas, beans, and other garden vegetables, mainly for home use, occupy the remainder of the acreage in vegetables.

Although statistics of production are not regularly available except for potatoes, it is estimated that the 1956-57 crop of tomatoes was about 140,000 tons, and that of artichokes about 60,000 tons. Roughly one-third of the tomato crop and over half of the artichokes ordinarily enter the export trade. An estimate for carrot production is not available, but exports were over 56,000 long tons in 1954-55 and reached 69,000 tons in the season following. Although over 76,000 tons of potatoes were exported in 1956, imports for the year totaled about 131,000 tons.

Citrus Fruits. -- Algeria is the oldest commercial citrus area in North Africa. Both Europeans and Muslims operate groves, but many of the varieties customarily grown on the usually small Muslim holdings are not suitable for export. The bulk of citrus for the trade is supplied by European growers, the majority of whose farms are quite large. For the country as a whole, about 30 percent of the groves are estimated to cover are estimated to cover from 25 to 75 acres, nearly 25 percent from 75 to 175 acres, and about 15 percent from 175 to 375 acres or over. Most commercial plantations are in the coastal region close to the sea, where they stretch for a distance of some 400 miles, roughly between Philippeville and Oran. The areas of most concentrated production are the Mitidja plain, the regions around Orleansville and Bone, the neighborhood of Philippeville, the Sig Valley, and the outskirts of Misserghin (Misserrhin), Perregaux, and Relizane. Although there are plantations of citrus in the mountainous districts and even in the oases of the Southern Territories, these are mainly small groves, scattered trees, or mixed plantings of citrus with other fruit and nut trees.

Most of the present citrus acreage is in oranges. Mandarins and clementines cover over 30 percent of the citrus area. Lemons; kumquats, and grapefruit are relatively minor crops. Diversification of varieties enables Algeria to export to France in volume from November

TABLE 10.--Potatoes: Area, production, and net trade, averages 1934-38 and 1945-54, annual 1955 and 1956

Period	Winter potatoes <sup>1/</sup>		Spring and summer potatoes		Total production	Net trade <sup>3/</sup>
	Area <sup>2/</sup>	Production	Area	Production		
	<u>1,000 acres</u>	<u>1,000 L. tons</u>	<u>1,000 acres</u>	<u>1,000 L. tons</u>	<u>1,000 L. ton</u>	<u>1,000 L. tons</u>
Average:						
1934-38	17	47	25	69	116	-11
1945-49	17	51	27	71	122	5
1950-54	27	116	35	122	238	-28
Annual:						
1955	30	104	37	123	227	39
1956 <sup>4/</sup>	27	( <u>5/</u> )	( <u>5/</u> )	( <u>5/</u> )	240	55

<sup>1/</sup> Planted from September and harvested from December to the end of April.

The figure for a given year represents the amount harvested between December of that year and April of the year following.

<sup>2/</sup> Includes interplantings.

<sup>3/</sup> Minus sign denotes excess of exports over imports.

<sup>4/</sup> Preliminary.

<sup>5/</sup> Not available.

TABLE 11.--Citrus fruits: Production and net trade, averages 1934-38, 1945-49 and 1950-54, annual 1955-57

Period	Production					Total fruit	Net trade <sup>1/</sup>
	Oranges	Mandarins	Clementines	Lemons	Grape		
	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>
Average:							
1934-38	<sup>2/</sup> 90	--	--	<sup>3/</sup>	<sup>3/</sup>	<sup>3/</sup>	-46
1945-49	84	37	13	<sup>4/</sup>	<sup>1/</sup>	139	-77
1950-54	177	54	26	9	2	268	-192
Annual:							
1955	226	59	35	11	4	335	-211
1956	241	57	38	14	5	355	-254
1957 <sup>4/</sup>	( <u>3/</u> )	( <u>3/</u> )	( <u>3/</u> )	( <u>3/</u> )	( <u>3/</u> )	379	( <u>3/</u> )

<sup>1/</sup> Minus sign equals excess exports over imports.

<sup>2/</sup> Includes mandarins and clementines.

<sup>3/</sup> Not available.

<sup>4/</sup> Preliminary.

until the end of May. Clementines are harvested first and are shipped through December; the mandarin harvest carries on from November through March. Orange exports begin in November with the Thomson and navel crops. Valencias are marketed from December to March. The Maltese and Portuguese ripen in late March or early April. Algeria's best citrus compares very favorably with superior U. S. table varieties.

Citrus juices are now commercially produced in Algeria and enjoy great popularity locally. A small amount is canned. Large quantities of preserved orange juice concentrate are exported in casks, principally to France, for use by soft drink bottlers.

Dry Legumes. -- Production of dry legumes has doubled since 1924. The increase has been particularly apparent in lentils, which in 1955 covered nearly 75,000 acres and produced more than 13,000 tons. Cultivation of lentils is mainly by Europeans on the high plateaus dividing the Department of Algiers and Oran. Various kinds of dry beans are grown, principally by Muslim farmers of Constantine. Production has averaged about 25,000 tons annually for the last 5 years. Dried round peas and chickpeas are mainly Muslim crops of lesser proportions, and nearly the total crop, from 15,000 to 18,000 tons, is grown in the Department of Oran. Production of vetchlings is small, not exceeding 3,000 tons in most seasons. From a prewar average of around 10,000 tons annually, exports of dry legumes are now about 30,000 tons.

Olives and Olive Oil. -- While Algeria's crop is small in relation to world production, olives contribute about a quarter of the total value of the Algerian fruit industry. From 3 million bearing trees in 1890, plantings throughout the country exceeded 11 million (87 percent bearing trees) by 1956, and covered nearly 185,000 acres. Yields of the olive groves vary according to regions, cultivation practices employed, and the year's weather, but the average return is estimated at between 25 and 30 pounds of olives per tree.

Over three-fifths of the land in olive groves is Muslim owned--nearly half by the Berbers of the Kabyle--and is largely cultivated by ancestral techniques. In European groves modern techniques and machinery are used. Most olive oil is produced by native presses and native processing methods, but European firms established in the last 20 years use extraction and refining equipment similar to that used in France. In 1953 there were estimated to be about 2,600 native grinding and extraction mills and 20 factories in the country.

TABLE 12.--Dry Legumes: Production and net trade, averages 1934-38 and 1951-55, annual 1956 and 1957

Period	Production					Net trade <sup>3/</sup>
	Lentils	Dry beans <sup>1/</sup>	Chick-peas	Other legumes <sup>2/</sup>	Total	
	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>
Average:						
1934-38	17	1	7	6	31	-12
1951-55	16	27	13	7	63	-27
Annual:						
1956	10	23	14	8	55	-24
1957	( <u>4/</u> )	( <u>4/</u> )	( <u>4/</u> )	( <u>4/</u> )	53	( <u>4/</u> )

1/ Haricot, broad, and kidney beans.

2/ Round peas and vetchlings.

3/ Minus sign denotes excess of exports over imports.

4/ Not available.

TABLE 13.--Olives and olive oil: Production and net trade, averages 1934-38 and 1950-54, annual 1955 and 1956

Period	Production			Net trade in olive oil <sup>1/</sup>
	Olives	Table Olives	Olive Oil	
	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>	<u>1,000</u> <u>L.tons</u>
Average:				
1934-38	102	9	12	<u>2/</u> -14
1950-54	175	16	23	-10
Annual:				
1955	108	18	28	-13
1956 <sup>3/</sup>	109	12	18	-14

1/ Minus sign indicates excess of exports over imports.

2/ Exports in excess of production are probably explained by stock carryovers, and by the inclusion of the weight of containers of exported oil.

3/ Preliminary.

Olive oil finds a ready home market, but a percentage varying with each year's price, is exported. While the Muslim population prefers olive to other vegetable oils, local consumption declines promptly if its price exceeds that of other vegetable oils. As the domestic demand declines, export availability rises.

Most conserved olives are prepared by Europeans, principally of Spanish origin, in actual production centers on the plains of the Cheliff, around Perregaux, at Sidi-bel-Abbes, Mascara, and Tlemcen. The bulk of these, the black varieties prepared in the Greek style and the green according to Spanish methods, enters the export trade.

Dates. -- Algeria has about 5-1/2 million bearing date palms from which production has averaged nearly 100,000 long tons annually in the last 10 years. The three principal varieties cultivated are the Rhars (about two-fifths of the crop), an early ripening soft, sweet date, eaten fresh or pressed into compact masses for storage or use by caravans; the Degla-Beida, a rich, dry date largely consumed by the natives, which nearly equals the Rhars in production and is exported in limited quantities (as is the Rhars); and the finest type, Deglet-Nour (Finger of Light), a delicate, amber-colored date which is grown primarily for the export trade. Less choice dates also authorized for export include the common moist Tafezouines and the common dry Kentichi.

Dates are mainly cultivated in the oases of the south, particularly in the southern portion of the Department of Constantine. Roughly between Biskra and Quargla, there are about 3 million trees which produce roughly 25,000 tons of Deglet-Nour dates in an average year, and perhaps twice that amount of the more common exportable varieties. In south Oran 1.7 million palms produce about 18,000 long tons of nonexportable dates a year. In the southern part of the Department of Algiers some 170,000 date palms annually produce a little more than 2,000 tons of nonexportable fruit, and in the extreme south of the country there are about 280,000 trees, producing 2,500 tons of the nonexportable varieties. Yield per tree is highest in the Constantine, averaging 55 pounds, as compared to 26 pounds in the Department of Algiers, 22 in Oran, and 20 in the southernmost areas.

Exports of Algerian dates have averaged in the neighborhood of 20,000 long tons or more in recent years. Although new markets are being sought, most of the export crop goes to France.

Figs. -- Figs rank next to olives in planted area of orchard crops. After citrus fruits and dates, the dried fig occupies third place in order of importance in the fruit export trade of the country. Like olives, figs are most extensively grown in the mountains of the

TABLE 14.-- Dates: Production and net trade, averages 1934-38, 1945-54, annual, 1955 and 1956

Period	Production	Net trade <u>1/</u>
	<u>1,000</u> <u>L. tons</u>	<u>1,000</u> <u>L. tons</u>
Average:		
1934-38	100	-4
1945-49	112	-22
1950-54	96	-20
Annual:		
1955	86	-24
1956 <u>2/</u>	90	-24

1/ Minus sign denotes excess of exports over imports.

2/ Preliminary.

TABLE 15.--Figs, fresh and dried: Production, averages 1934-38, 1945-54, annual 1955 and 1956.

Period	Fresh	Dried
	<u>1,000</u> <u>L. tons</u>	<u>1,000</u> <u>L. tons</u>
Average:		
1934-38	49	17
1945-49	89	29
1950-54	95	29
Annual:		
1955	77	20
1956 <u>2/</u>	91	24

1/ Total production, including quantities saved for drying.

2/ Preliminary.

coastal region. The Kabyle, especially in the regions of Bougie and Tizi-Ouzou, possesses the greatest number of fig trees.

Cultivation is principally by Muslims and is usually a family enterprise. Fresh and dried figs form a large part of the food in the Kabyle. In this community annual per capita consumption is estimated at nearly 200 pounds, which indicates that only one-quarter of the harvest is regularly available for commerce.

There are many variations of the fruit, some of excellent quality. The Taaramint, a large, thick-skinned type, and the thin-skinned Tamerouth are the most renowned in the dried fig trade. Exports of dried figs averaged about 13,000 long tons annually in the 1950-54 period, but declined in 1956 to about 8,000 tons, or a decrease of roughly one-third in that year. France is the principal customer.

Other Fruits. --Other fruits and nuts common to the Mediterranean basin--almonds, apricots, plums, peaches, cherries, Japanese loquats, and apples--are grown in the coastal regions of Algeria. There is a small export trade in these crops, particularly in almonds and the stone fruits, which is roughly balanced in most years by imports of other varieties of deciduous fruit, principally from France.

Tobacco. --During the 1950-54 period nearly 80,000 acres of land were in tobacco, the first industrial crop developed in Algeria. Although the Algerian product is low in quality and relatively expensive to grow, cultivation has been encouraged since World War II, in order to promote a more diversified economy. Muslim farmers cultivate most of the crop, often under the Khammasa system of tenancy, whereby the landlord is paid in kind for the use of land, seed, and equipment. Before the rebellion, annual production averaged around 20,000 tons, but rebel activities have brought about sharp declines both in acreage planted and total output.

Nearly all of the leaf crop is grown without irrigation. About 50 percent is produced in the Bone area; this is sun-cured for use in the manufacture of cigarettes and pipe tobacco. A heavy, dark, air-cured leaf is grown in the Kabyle and the Mitidja district of the Department of Algiers. Leaf from these two areas is used for blending purposes in all tobacco products, except cigars and snuff. Both the sun-cured and air-cured tobaccos are narrow-leafed, heavy-stemmed varieties, with inferior burning qualities. Foreign types of tobacco, including flue-cured and burley, have been planted experimentally in the country, but because of climatic and soil conditions have not been successfully produced in quantity.



TABLE 16.--Tobacco: Number of planters, area, production, and net trade, averages 1934-38, 1945-54, annual 1955 and 1956.

Period	Planters	Area	Production	Net trade <u>1/</u>
	Thousands	1,000 acres	1,000 L. tons	1,000 L. tons
Average:				
1934-38	16	57	19	-8
1945-49	15	57	16	-4
1950-54	19	79	22	-8
Annual:				
1955	20	73	20	-10
1956 <u>2/</u>	8	37	7	-6

1/ Minus sign denotes excess of exports over imports.

2/ Preliminary.

TABLE 17.--Cotton and flax: Acreage and production, averages 1945-54, annual 1955 and 1956

Period	Cotton		Flax	
	Area	Production	Area	Production
	1,000 acres	1,000 L. tons	1,000 acres	1,000 L. tons
Average:				
1945-49	1.7	.1	<u>1/</u> 77.1	<u>1/</u> 13.3
1950-54	17.0	1.4	9.6	1.7
Annual:				
1955	25.7	1.8	3.7	.8
1956 <u>2/</u>	24.7	1.3	2.2	.4

1/ 2-year average, 1948-49.

2/ Preliminary.

Vegetable and Fiber Crops. --Except for alfa (esparto grass) and crin vegetal, which are customarily classified as forest products, 1/ vegetable fiber production is small. In recent times the Algerian cotton crop has not exceeded 2,100 long tons of fiber a year. The bulk of it, a good quality Acala, is cultivated under rainfall in the Department of Constantine near the Tunisian border. A limited amount of Egyptian is produced under irrigation on the sublittoral plains of the Departments of Algiers and Oran, principally in the Cheliff, Mina, Habra, and Sig districts. This is Pima X Sakel, which resembles Karnak, but is coarser and less regular. About 60 percent of the crop is grown by Muslims, and it is estimated that 70 percent of the value of the crop is paid out in wages to Muslim field hands.

A considerable portion of the cotton crop is exported, principally to France. Imports of raw cotton are small, most cotton entering Algeria in manufactured forms.

Since government support was withdrawn a few years ago, flaxseed production has steadily declined. Some ramie is grown in the area, and jute, hemp, sisal hemp, and abaca have been cultivated from time to time, but on an experimental basis only.

Sugar Beets. --Sugar beet plantings, which in the years 1950-53 averaged about 4,400 acres and annually produced about 13,000 long tons of beets, increased to nearly 9,500 acres at the end of 1956, with a production of over 33,000 tons. Practically all cultivation is on European farms. In late 1953 a refinery of about 5,000 tons annual capacity was put into operation at Mercier-Lacombe in Oran, now the area of greatest sugar beet production. In 1954, the first full year of domestic refining, nearly 2,500 tons of beet sugar were produced, and in both 1955 and 1956 the total output was over 3,000 tons.

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1/ Brief reference to three forest products is made because of their quasiagricultural nature. In normal years, about 150,000 tons of esparto (alfa) grass are exported, mostly to Great Britain and France for use in the paper and pulp industry. Production of crin vegetal (dwarf palm fiber) averages about 20,000 tons a year. This is principally exported for use as filling for mattresses and upholstery and in the manufacture of cording and rope. Production of cork, primarily for export, averaged nearly 37,000 tons annually before the rebellion. As a result of concentrated rebel activities in the cork forest areas, production declined to about 5 percent of that figure by 1957. It is estimated that from 3 to 5 years will be required to regain a normal production level, given complete peace.

Exports of sugar are negligible. Imports, which normally total from 128,000 to 133,000 tons annually, have exceeded 157,000 long tons in the last 2 years, to meet added consumption requirements of French military forces in Algeria.

Geranium Oil. -- One of the most important minor agricultural industries of the coast region, especially in the littoral of the Department of Algiers, is the cultivation of rose geranium for oil. This crop is grown chiefly by Europeans, following the cultivation practices used in southern France. In recent years annual production of distilled geranium oils has been about 20 tons, most of which is exported to France. The United States and Great Britain are the principal foreign buyers.

Among other perfume oils produced in small quantities in the country are neroli from Seville orange blossoms, lavender, mint, rose, and jasmine.

### Livestock and Livestock Products

Algeria's livestock industry, which is supported by well over 12 million animals (allowing for those not enumerated for tax purposes) is largely a Muslim enterprise. Europeans take a minor part in the pastoral system of the country.

Sheep are found in greatest numbers on the steppes, goats on the steppes and in the woods and mountains adjacent to the plains, and camels on the steppes and in the Saharan region. Cattle, horses, asses, and mules are mainly bred on the Mina-Ain Bessem-Setif-Constantine-Guelma axis. This region provides summer forage for the greater part of the migratory herds as well. Except for swine, all types of livestock can be found in the Southern Territories.

The fixed livestock population is pastured on fallow land and stubble, or fed forage crops, oats, or barley. In the mountains of the coastal zone, St. John's bread (the carob), the Indian fig, elm leaves, olive tree prunings, dried fig, and mountain ash leaves are used for forage. Most of Algeria's livestock, however, is dependent for feed on the natural range and throughout each year must travel long distances for feed and water. The movements of the migratory animals follow a regular pattern--northward as far as the northern Atlas range in spring, then a southward return with the beginning of the fall rains.

Under best weather conditions the country can now support only about 10 million head of stock on a sustained basis. But considerable effort has been made by the government to improve the quality of the

TABLE 18. --Livestock: Number, by type, averages 1934-38 and 1945-54, annual 1955 and 1956 1/

Type	Average				
	1934-38	1945-49	1950-54	1955	1956
	<u>1,000</u> <u>head</u>	<u>1,000</u> <u>head</u>	<u>1,000</u> <u>head</u>	<u>1,000</u> <u>head</u>	<u>1,000</u> <u>head</u>
Sheep	6,001	3,654	5,583	6,298	6,384
Goats	2,845	2,411	3,180	3,353	3,130
Camels	173	147	161	221	217
Cattle	841	775	819	912	840
Horses	178	200	213	208	201
Mules	183	228	236	233	208
Asses	342	308	346	366	358
Swine	57	132	97	79	77
Total	10,620	7,855	10,635	11,670	11,415

1/ As reported for tax purposes. In the case of sheep, reliable sources indicate that these may actually total 8 million head

TABLE 19. --Wool: Commercial production and net trade, averages 1934-38 and 1950-54, annual 1950-56

Period	Production (Wool in the grease)	Net trade <u>1/</u>	
		Greasy	Washed
	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>	<u>1,000 L. tons</u>
Average:			
1934-38	7.4	-4.2	.2
1950-54	6.5	-1.2	.1
Annual:			
1950	4.3	-1.2	.1
1951	5.1	-2.5	-.1
1952	6.3	-0.3	.2
1953	8.5	-2.0	.1
1954	8.3	-2.9	.1
1955	8.4	-1.2	( <u>2/</u> )
1956 <u>3/</u>	( <u>4/</u> )	-1.0	.2

1/ Minus sign denotes excess of exports over imports.

2/ Negligible.

3/ Preliminary.

4/ Not available.

industry by digging wells in the dry plateaus, by developing pasturage and forage areas, and by accumulating stocks of fodder reserves for drought years. SAR stockbreeding stations and selective reproduction and treatment centers demonstrate modern methods of breeding and disease prevention. The Tadmit experiment station has been active in such programs about 40 years, that at Kroub (Le Kroub), since 1945.

Sheep. -- Sheep are raised mostly for their meat, but the wool clip is considerable, and sheep's milk is a major element in the diet of sheep raisers and their families. The three principal native breeds are the Barbary, the Berber, and Arab.

Barbary sheep, characterized by tails weighing from 9 to 12 pounds, are native to eastern Algeria, particularly the Department of Constantine. There are two types of the Berber breed: (1) Barbarine, large-framed animals, with long, straight wool resembling goathair which are raised chiefly in the Kabyle, the Ourasen mountains, and the regions of Tiaret and El Aricha; and (2) the broad-chested Beni-Guil, raised mainly in the Department of Oran. Purest strains of the Arab breed are found in the southern part of the Department of Algiers, in the Ouled Nail Mountains and in Chellala Commune. These are spiral-horned, droopy-eared, flat-chested animals with strong legs and short, dense fleece. Crossed with Merinos the Arab produces a superior animal, well-fleshed and bearing wool that is improved both in quality and quantity.

Mixtures and divisions of native breeds are chiefly distinguished by differences in coloration and in formation of the head and neck. Imported breeds, usually held by European farmers, are the English Southdown, the Rambouillet, the Ile-de-France, and the Wurtemberg.

Sheep are grazed on the plateaus gradually working north, from October to April, when the exporting season begins. For the butchering trade, the animals are shipped alive, chiefly through the ports of Oran and Algiers.

Goats. -- Herded together with sheep by Muslim herdsmen, goats are prized for their milk, meat, and hair. European goat raisers are principally concerned with milk production. Two native breeds are found in the country, the long-haired, horned Kabyle goat, and the hornless Arab which gives more milk than the Kabyle.

Camels. -- Camels are raised and used in Algeria almost exclusively by Muslims. The one-humped Arabian, or dromedary, camel predominates. A racing breed, Mehari, is widely raised in the south, although the demand for these animals has decreased somewhat as

motor transport has become more widely available. The camel serves also as a draft animal and is a source of milk, meat, hides, and hair.

Cattle. -- About 85 percent of the cattle in the country are owned by Muslims. Principal native breeds are the Guelma in the east and the Moroccan in the west. With uncontrolled breeding, native cattle mature late, at about 7 years of age, average in weight only about 500-600 pounds, and have a low milking capacity. They are strong, however, and make excellent work animals when well treated.

In normal times, large numbers of cows are imported. European farmers interested in milk production have brought in Brown Swiss, Tarentaise, Montbeliarde, and Comtoise cows, among other well-known breeds. In general, these are expensive and do not adapt easily to Algeria's trying climatic conditions. The Livestock Service has undertaken repeated experiments at cross-breeding the native Guelma cattle with imported animals. Crosses with Tarentaise have proved rewarding, producing a larger, heavier animal giving more milk and meat.

Horses. -- Most Algerian horses are of the light but vigorous Barbary breed, an admixture of Arabian blood which is said to produce the finest cavalry horses in the world. They are of medium size, but are quick and very hardy. Horse breeders of the plateaus have successfully crossed Barbary horses with Breton stallions to produce a work animal of remarkable energy and stamina. Muslim farmers owning horses generally use them to draw plows.

Mules and Asses. -- Mules are used by European farmers to haul wagons and plows and by Muslims for both riding and pack animals. Mules of the pure native strain are lightweight, but hardy and are especially useful in the mountainous regions. Heavier work mules are sired by imported asses, usually breeds from Poitou, Catalonia, or Savoy. The small ass common in all North African countries is found all over Algeria; capable of adapting to a rigorous existence with little care, it serves chiefly as a pack and draft animal.

Swine. -- The bulk of the swine population is raised for meat, exclusively by Europeans, as the Muslim religion forbids the use of pork by its followers.

Poultry. -- Although recent official statistics are lacking, there are estimated to be about 10 million chickens, 80,000 ducks, 10,000 geese, and 50,000 turkeys in the country. Most European farmers keep poultry for their own consumption, and many Muslims own a few. Native chickens are small, the hens averaging about 2-1/2 pounds and roosters slightly more. Egg production is low, and the eggs are

small, averaging less than 1.8 ounces. European poultry is generally of better quality, the imported breeds or improved types produced by crossing native birds with imported breeds giving higher meat and egg return.

Meat. --The only official indication of meat production derives from statistics of slaughterings of cattle, sheep, goats, and swine in municipal abattoirs in northern Algeria. With allowances for uncontrolled slaughterings, a representative annual supply of Algerian carcass meat, based on the 1954 livestock population, is estimated at about 20,200 tons of beef; 29,600 tons of mutton; pork, 6,700 tons; goat's meat, 5,300; camel meat 1,800; the meat of horses, mules, and asses, 8,500 tons; and 4,900 tons of offals. The total, 77,000 tons, would indicate a percapita consumption of only about 17 pounds a year, or with the addition of poultry meat, about 19-20 pounds per person.

Modest quantities of Algerian meats are exchanged for types not available within the country, but since in normal times exports and imports are closely balanced, consumption is roughly equivalent to total slaughter. Mutton is the chief export item; imports are canned and preserved meats, largely pork, and French beef. Most of the goat, horse, and camel meat is eaten by Muslims, the pork by non-Jewish Europeans, and the beef and mutton by all.

Wool. --Algerian sheep are almost entirely of the wool variety, yielding mainly a coarse fleece suitable for making blankets and carpets. Muslim farmers do not shear young lambs on account of the cold, but of a total sheep population exceeding 8 million, the number of older animals shorn is estimated to be between 6-1/2 million and 7 million, and the average yield per sheep from 3-1/2 to nearly 5 pounds. Total wool production would then range from a minimum of about 9,500 long tons to a maximum of some 14,600 a year.

Usually a high percentage of the wool sheared is kept by the herdsmen for their own use, but the proportion offered to the trade bears direct relation to current prices. When these are favorable, a larger quantity of wool is for sale to exporters; when prices fall, the bulk of the clip is kept or traded to local artisans. Official statistics, in table 19, refer to the commercialization of raw wool. No distinction is made for grades or other differences.

France purchases most of Algeria's wool exports. Imports are mainly in the form of scoured wool from France, but Morocco, Australia, New Zealand, Argentina, Uruguay, and the South African Union supply minor amounts of both cleaned wool and wool in the grease.

Goathair. -- Except for about 5,000 tons which enters commercial channels each year, most goathair is kept by Muslim herders for their own use.

Hides and Skins. -- There are no recent reliable statistics as to the total production of hides and skins. The quantity available in the country fluctuates as the livestock population and slaughterings vary from year to year. It is estimated that local tanneries absorb from 60 to 70 percent of the annual production of bovine hides, 30 percent of sheepskins, 20 percent of goatskins, and half of the horse and mule hides.

As with wool, trade in hides and skins depends on world prices to some extent. For the 5-year period 1952-56, exports averaged about 7,400 long tons, with France, Morocco, Western Europe, Great Britain, Libya, Egypt, and Syria the principal customers. Imports are normally about 1,700 to 2,000 long tons annually, and come mainly from France, Morocco, and Tunisia.

Dairy Products. -- It is reported that total milk production does not often exceed 440,000 long tons a year. About half is estimated to be goat's milk, and most of the remainder sheep and cow's milk in roughly equal proportions. Practically all goat's and sheep's milk, with that of camels, is consumed by the animals owners, or absorbed in the immediate community. Most cow's milk is produced by farmers or owners of small dairies. There are no large dairies in the country, and the demand for fresh milk is greater than the supply. Small quantities are imported, but canned and powdered milks from other countries mainly make up the difference. On account of the scarcity of proper natural forage, both the nutritive value and the quantity of Algerian cow's milk are low.

Since World War II the Livestock Service has endeavored to increase milk production and improve its quality, by instruction in animal husbandry and inspection. Subscription to the service is voluntary on the part of farmers, who receive a premium on their milk for participation in the program. Some attempt is made also to supervise milk handling throughout the country, but much offered for consumption would be considered dangerous by American standards.

Milk producers use a small proportion of their cow's milk in making butter and cheese for family use, but there is practically no commercial production of these items. About 5,000 tons of sheep and goat's milk cheese are estimated to be made annually, principally by Muslim stock raisers, since the Europeans are accustomed to importing their cheese.



## TRADE IN AGRICULTURAL COMMODITIES

Trade policies, agreements, and controls originate in Paris, although normally Algeria is given representation when decisions of the National Assembly would affect Algerian agriculture. The country operates under the French customs tariff, and most foreign products are subject to the import duties of this tariff. Commodities destined for or coming from foreign countries require licenses, as do imports of wine, cereals, some edible oils, and oilseeds.

Generally, trade with countries outside of the franc zone is carried on under France's bilateral trade arrangements. The exchange controls effective in France apply also to Algeria. No exchange permits are required for Algerian imports from France, French Union countries, or certain countries for which the importer has the necessary foreign exchange abroad. While Algerian products receive preferential treatment in the French market, when marketing problems exist for specific commodities, French producers actively compete with Algerian production.

In terms of value, exports of crops take first place in Algerian trade. About three-fifths of the value of exports in recent years consisted of the country's main agricultural products, balanced against about 15 percent, by value, in principal agricultural imports. Major agricultural exports are wine, truck crops, and citrus fruits, and major agricultural imports, sugar, coffee, dairy products, and vegetable oils.

Metropolitan France is the most important source of supply (over four-fifths of the value of total trade in 1955) and provides a market for the bulk of Algeria's agricultural production (in 1955, more than 90 percent in terms of value). Nonagricultural products make up the larger part of Algerian imports from France, but dairy products, cereals, fruits, meat, oils, live animals, and sugar also come from the Metropole. Twenty years ago exports to France exceeded imports; today the reverse is true.

French Union countries hold second place in Algerian trade, both in exports and imports. They supply coffee, tea, vegetable oils, bananas, and some sugar in return chiefly for wine and tobacco.

Algeria's trade with foreign countries is not large. The cost of crating, shipping, and distributing its agricultural commodities is so high that the country cannot now compete effectively in markets outside of the French Union. Italy, Germany, Austria, Sweden,

TABLE 20.--Principal agricultural commodities: Percentage value in total trade, 1938, average 1951-53, and 1955; dollar value, 1955

Category	Percent of value to total trade			Dollar value
	1938	Average 1951-53	1955	1955
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Million U. S. dollars</u>
Imports:				
Sugar	4	5	5	35
Coffee	1	4	3	20
Milk, butter, and cheese	2	3	3	20
Vegetable oils	3	2	2	10
Other imports	90	86	87	612
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>697</b>
Exports				
Wine	47	35	39	178
Potatoes and fresh vegetables	3	5	5	22
Citrus fruits	1	4	7	30
Semolina products	1	6	4	18
Tobacco	2	3	2	9
Olive oil	3	2	2	7
Barley	1	4	1	5
Wheat	3	(1/)	2	10
Other exports	39	41	38	184
	100	100	100	463

1/ Less than .05 percent.

Switzerland, and Great Britain are customers for fruits and vegetables. Olives, olive oil, and capers are exported to Italy, Bulgaria, Hungary, Poland, and Czechoslovakia. The Netherlands, the Scandinavian countries, and Switzerland are suppliers of dairy products. Green tea and peanuts come from Communist China.

From time to time, U. S. grains are exported to Algeria, and recently exports of vegetable oils have increased, but usually Algeria's major U. S. imports are industrial machinery and equipment, and agricultural machinery and vehicles not obtainable from France. With the possible exceptions of oil drilling and production equipment and military aircraft, there seems little prospect for an early expansion of the American market in Algeria. In the present shortage of exchange, especially of dollars, exchange privileges and import licenses can be granted only for essential items. Algerian exports to the United States seldom exceed 2 percent of the value of Algeria's total export trade and are mainly composed of nonagricultural commodities.

TABLE 21.--Value of United States trade with Algeria, 1956

Commodity	U. S. exports	Commodity	U. S. imports
	<u>1,000 U. S. dollars</u>		<u>1,000 U. S. dollars</u>
Agricultural .....	6,449	Agricultural.....	731
Wheat grain .....	2,817	Olives and olive oil..	134
Vegetable oils ....	3,041	Geranium oil .....	285
Tobacco and mfgs.	439	Sausage casings .....	27
Cotton .....	95	Hides and skins .....	11
Other .....	57	Lentils .....	26
Nonagricultural ...	12,694	Argols, wine lees, tartars .....	213
Total exports ...	19,143	Other .....	35
		Nonagricultural ....	2,038
		Total imports .....	2,769

## DOMESTIC FOOD CONSUMPTION

Dietary patterns differ between social and economic classes, between townspeople and rural dwellers, and vary in different sections

TABLE 22.--Food balance, excluding alcoholic beverages, 1954

Commodity	Production		Supply		Nonfood use				Supply for food		Per capita daily Calories
	1,000 L. tons	Net trade 2/ 1,000 L. tons	Total		Seed and waste 1,000 L. tons	Feed 1,000 L. tons	Indus- trial 1,000 L. tons	Total 1,000 L. tons	Total food 1,000 L. tons	Per capita yearly Pounds	
			1,000 L. tons	1,000 L. tons							
Wheat	1,370	68	1,438	234	-	-	-	234	3/963	226.2	985
Barley	920	-71	849	157	63	1	1	221	3/534	125.4	520
Rice	8	4	12	1	-	-	-	1	11	2.6	10
Other grains	128	-11	117	19	85	-	-	104	3/12	3.3	15
<b>Total grains</b>	<b>2,426</b>	<b>-10</b>	<b>2,416</b>	<b>411</b>	<b>148</b>	<b>1</b>	<b>1</b>	<b>560</b>	<b>1,520</b>	<b>357.5</b>	<b>1,530</b>
Sugar, refined	3	133	136	-	-	-	-	-	136	32.0	155
Potatoes	250	-9	241	36	-	-	-	36	205	47.8	40
Other fresh vegetables	275	-127	148	-	-	-	-	-	148	35.1	100
Dry legumes	67	-27	40	19	2	-	-	21	19	4.6	25
Fruits, fresh	464	-252	212	-	-	-	-	-	212	47.6	30
Fruits, dried	128	-36	92	-	-	-	-	-	92	21.4	65
Meat and poultry, carcass weight	85	1	86	-	-	-	-	-	86	20.1	50
Fish, landed weight	22	-1	21	-	-	-	-	-	21	4.9	10
Edible fats and oils, including butter	31	49	80	-	-	-	-	-	80	18.7	190
Nuts	2	6	8	-	-	-	-	-	8	1.8	15
Milk and cheese	443	21	464	-	-	-	-	-	464	111.1	120
Eggs	71	-2	69	-	-	-	-	-	69	15.9	35
<b>Total consumption</b>											<b>2,365</b>

1/ Consumption per capita is based on a population of 9,529,726--the reported population for 1954. Grapes for wine are not included. Partly to compensate for understatement of production, estimates for increases in stocks were excluded. Calorie conversions are based on FAO factors.

2/ Minus sign indicates excess of exports over imports.

3/ Flour equivalent of grain. Extraction rates applied are: 80 percent for wheat; 85 percent for barley; 94 percent for other grains.

of the country. An estimate of the kinds and quantity of food consumed per capita of the population as a whole cannot correctly reflect the actual consumption of an "average Algerian." For instance, many more dates are consumed per capita in the Saharan regions than is indicated in national per capita consumption. The same applies to figs in the Kabyle. In olive-growing sections more oil is used for food than in other localities. Away from the coast little seafood is eaten. Although some nomadic tribes live on meat and milk almost exclusively, consumption in many areas is very low. Barley is by far the main food on the high plateaus.

Among urban Muslims, there has been a recent increase in the use of wheat products, in place of barley, as well as a rise in annual per capita consumption of sugar, potatoes, butter, concentrated milk, and cheese. French sources report that meat, fruits, legumes, and fresh vegetables also are used in greater quantities than ever before by the Muslim sector of the urban population. But generally speaking, only the wealthier Muslim groups are able to afford a well-balanced diet, on a sustained basis. The diet of most Europeans in the country, tending to follow nationalistic preferences, is considerably superior, both in quantity and nutritive value, to that of most Muslims.

Table 22, an estimated food balance for the year 1954 based as nearly as possible on official reports of domestic supplies and net trade, is defective in that it combines high European and generally low Muslim standards to arrive at a consumption rate which cannot be realistically applied to either single group. For many Algerians, the level would have to be reduced below the end figures shown in order to fit their daily intake of food; for others, the estimates given are probably too low.

The estimated degree of self-sufficiency in 1954 was 85 percent, or 2-3 percent higher than in less successful crop years, when heavier wheat imports and reduced exports of barley are added to normal deficiencies in sugar, edible oils and fats, dairy products, and some meats. For the 1934-38 period, when the population averaged 7.2 million, the degree of self-sufficiency was believed to be about 91 percent.

## GOVERNMENT MEASURES FOR AGRICULTURAL REFORM

The Mollet-Lacoste legislation for agricultural reform and the expansion of agricultural industries follow the broad objectives of the successive Four Year Plans which were initiated in 1949 and the Soustelle proposals of 1955. Major recommendations of the decrees include--

An increase of 25 percent in minimum wages for farm laborers;

A guarantee to sharecroppers of not less than half of the crop, in place of the one-fifth dividend which was customary under the old Khammasa form of tenancy;

Expropriation of land not being fully irrigated when appropriate irrigation facilities exist;

Creation of administrative mechanisms to clear land titles and to encourage redistribution of land parcels to permit more efficient use of modern techniques and equipment;

Establishment of a fund with which small farmers may acquire holdings laid out in economic units, and provisions for expropriation of land holdings of more than 2,500 acres in size as necessary for this purpose;

Granting of long-term credit; and

Revision of existing agricultural credit institutions of the country, so that all may offer mutual credit.

Beyond the granting of wage increases and the tentative reorganization of the agricultural credit establishments, implementation of the decrees to improve the lot of the Muslim farmer has been somewhat hampered by the abnormal political climate. Although an agency created in the fall of 1956 has been able to acquire some grain lands from large European combines under the expropriation decree, redistribution to small landholders has been difficult. Resettlement of Muslim families on plots of irrigated land in the disturbed north has been slow.

But in the south, a project to distribute date palms in the oases of Touggourt and Quargla has been successfully developed. This plan calls for the assignment of some 90 trees each, to about 10,000 families of those areas.

Present efforts appear to be mainly directed toward the maintenance of normal production levels in the basic crops. It seems probable that this situation may remain at stalemate, or nearly so, throughout the period of hostilities.

## POSSIBILITIES FOR INCREASED AGRICULTURAL PRODUCTION

The uncertainties of the Algerian economic situation, added to the country's physical limitations and to deeply rooted Muslim reluctance to change, indicate that, even after peace has come, progress in agricultural reforms will be slow. Expansion of Algeria's production largely depends on (1) the opening of new areas of cultivation; (2) more effective use of the land now cultivated; and (3) conserving and protecting livestock and grazing areas.

There is not enough potentially arable land remaining in the country to attain self-sufficiency in agriculture by simple extension of farmed land. Since French colonization, over 5 million formerly unproductive acres, principally marshes and brush stands, have been drained, cleared, and converted into some of the country's most valuable cropland, but possible new acreages today do not exceed 250,000 acres. These are chiefly marshlands in the neighborhood of Bone which would require draining, areas on the plains of Oran which could be reclaimed by salt removal, and scattered parcels of uncleared land. In all, their reclamation would increase the cultivable acreage by less than 2 percent.

Irrigation offers some prospect for increasing the output on land which is now underproducing, but only in restricted areas probably totaling less than 125,000 acres, or about 10 percent more than present government programs for extensive irrigation and water conservation envisage. 2/

Modification of traditional landholding systems to eliminate waste caused by fragmentation would be helpful, especially in the irrigated sections. Total arable land might also be expanded by restoring soils rendered useless through erosion, haphazard cultivation, deforestation, and over-grazing. Much attention has recently been given to reforestation, of hillsides by means of terracing and planting trees, not only to prevent further erosion, but to increase the domestic supply of timber. Nearly 500,000 acres have been reclaimed by soil conservation projects.

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2/ In 1956 nearly 1.3 million acres were under irrigation, or included in projects to be completed: 370,000 acres were irrigated by 1,700 miles of canals and ducts; about 124,000 acres in the coastal plains and 740,000 acres in the high plains and the Sahara, by pumping up subterranean water. Twenty-two storage dams have been constructed since 1920. A comprehensive system of watering points in the grazing areas have been established in an effort to diminish the disastrous results of drought on herds, sheep in particular.

More effective use of presently cultivated land would involve Muslim ability and willingness to accept new farming methods, especially increased mechanization. Because of the Muslim community's adherence to ancient customs, because of its general financial instability and its lack of enthusiasm for foreign innovations; this will be a long-term process, given the best of political circumstances.

Group instruction, carried on by the expansion of such institutions as the cooperatives and the provident societies, appears to be the most reasonable approach to the re-education of the Muslim farmer. This entails direct financial support, either by the government or through special agricultural credit organizations able to supply low-cost, long-term credit. Cooperatives, with the help of local credit organizations, are probably best equipped to implement development of irrigation facilities and the mechanization of farms, as well.

Any substantial agricultural reform program will tend to reduce the number of persons needed to work the land. Underemployment, particularly in the rural areas, has already reached serious proportions. Agricultural development must be accompanied by facilities for absorption of excess agricultural workers, largely unskilled, in newly created industries.

Maintenance of satisfactory conditions for livestock, especially sheep, is mandatory for the welfare of the large pastoral population. This will involve provision for additional watering points and small irrigation works to open up new forage areas. Extended veterinary controls, particularly in disease prevention and selective breeding, are indicated. Organization of a stable wool market would benefit the trade.

In expanding the market for agricultural exports, both in the franc and foreign currency zones, the problem is to reduce production costs while maintaining and improving the quality of the product. Workable solutions vary with the commodity.

Assuming that Algeria is to remain an integral part of France, it is doubtful that agricultural development can be given priority after the pacification of the country is complete. In the immediate post-rebellion period, the urgency of replacing wartime losses in capital and resources, the possibility of a further increase in balance of payments deficits, as well as a decline in foreign markets, may mitigate against early attention to the broad agricultural reforms now proposed. In addition, the implementation of future French plans to raise the national standard of living may entail heavier emphasis on industrial development than on improvement of agricultural production. Thus, the



case for agricultural development may become subordinate to an industrial revolution, which cannot come about without additional supporting capital. Saharan oil may provide new assets sufficient to stabilize the total Algerian economy, but without these there is little prospect for a rapid increase in Algerian agricultural production for some time to come.

## PRINCIPAL SOURCES

In addition to the sources listed below, generous use has been made of the excellent historical and current records of the American Consulate General at Algiers. Various information bulletins of the French Government have been incorporated in part, as seemed appropriate.

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