

Oranges do not grow

in the North. Everyone knows that cotton, tobacco, and vegetables are grown in certain places; that dairy farms may produce fluid milk or butter or cream; and that some land suitable for potatoes is used to grow soybeans. Why? Physical and economic forces give the answer and provide bases for outlining major type-of-farming regions, although modern technology has made agriculture more flexible. By *Ronald L. Mighell*, agricultural economist, Farm Economics Research Division.

LAND, as we have seen, no longer occupies the leading place among the resources used in farming in the United States. Its central place has diminished with the progressive advance of technology and the greater use of machines and other capital goods.

In today's farming systems, the annual value of the services of the capital goods used outweighs the value of the services of land by about 2 to 1.

Farmers no longer are close captives of their environment. They are able to control and direct natural forces in many ways. The picture of Man wrestling the raw forces of Nature with little more than his bare hands, as revealed in such works as Edwin Markham's *Man with the Hoe*, and Grant Wood's *American Gothic*, has been banished to the past. Present ways of using land in farming are as far removed from this former reality as today's mechanized ways of building highways are from yesterday's pick-and-shovel methods.

This means that farmland can be used for more different purposes than ever before. The properties inherent in the land are now less restrictive, and other resources determine oftener what the most economic use shall be. The characteristics of land nevertheless still set limits that influence the broad patterns of agriculture. The successful

farmer is the one who learns how to cooperate with the natural and biological processes that are linked to land.

What determines how farmland shall be used in any area or region? Why are certain combinations of crops and livestock grown in one region, but not in another? Questions like these seek answers.

In general terms, two groups of forces—the physical and the economic—influence the use of farmland.

Physical factors are the ones that we think of in describing the land itself—climate, soil, topography, elevation, water supply, and the like. They are the properties that are naturally a part of the land. They were here before people occupied the land.

Economic factors have to do with man in his relation to the land—nearness to markets, communication facilities, public and private investments, patterns of ownership and management, and other institutional arrangements. The personal characteristics and skills of farm people in a region may be significant elements, too.

One group of institutional factors that is especially notable in international trade is referred to collectively as artificial barriers to trade. Many countries use tariffs, quotas, exchange restrictions, and other devices to “protect” themselves from the competition

of others. Internal barriers to trade grow up even between sections and States in this country, sometimes in connection with such desirable objectives as efforts to promote public health and sanitation.

Economists began long ago to explain the different uses of land in terms of the principle of comparative advantage. This is a striking term. It means that which pays best.

Land used according to its comparative advantage is used to produce the commodity or combination of commodities that pays better than any other commodity or a combination of commodities under the given circumstances. This sounds reasonably simple, but the actual finding out of what pays best is often a complicated business. It cannot be discovered once and for all. Changing technology and changing conditions of demand and supply mean that comparative advantage is forever shifting.

Suppose we look at the physical differences in land. Some of them are so obvious that many observers have considered that they might explain completely the different uses of land. In this country, for example, oranges can be grown only in certain favored frost-free areas in California, Texas, Arizona, Louisiana, and Florida—not in Minnesota and Maine.

But even if there were no physical differences in land, there would be many different uses of land, because our wants and needs involve many different farm products.

LOCATION THEORY was first developed to explain how transportation costs determine the use of land. J. H. von Thünen, a German economist of the 19th century, was the first to analyze carefully this kind of location problem in a three-volume work, *The Isolated State*. He was fascinated, as many have been since, by the systematic spatial geometry that results if one makes a few bold, simplifying assumptions.

Von Thünen imagined an immense

plain, in the center of which he placed his isolated city-state. In this self-contained economy, the natural conditions—the climate, soils, topography, and all the rest—were entirely uniform. Extension in space, or distance, was the only factor that made one place different from another.

He then worked out the pattern of a farm production that would arise about the city in terms of the concentric zones, which would minimize transportation costs. Bulky or perishable products, like fluid milk and fresh vegetables, would be produced in the inner zones nearest the city. More concentrated products—those with a high value per unit of weight—and the less perishable items would be produced farther out.

This kind of theory has been helpful in analyzing some of the aspects of the location of farm production. It explains, for example, why our butter, cream, and fluid-milk areas are located at varying distances from market.

Differences in the other physical characteristics of land, however, may have even more to do with the geographic distribution of farm production. Mainly because most of these other characteristics are distributed so irregularly, we have a seemingly haphazard production checkerboard.

Some areas have what is called an absolute advantage in production of certain commodities: Winter vegetables grow only in frost-free areas. Bananas grow only in certain tropical situations. Cotton grows only within a given temperature range. Tobacco grows only on certain soil types.

An absolute advantage is only an extreme form of comparative advantage, however. The usual situations are those in which any of a large number of products can be grown, but in which a few have relatively greater advantage. Frequently this is because the yields of the commodities grown are higher than yields in competing areas, but it may not be true: It may be only that the commodities are better in terms of value than

competing products in the same area.

The principle of comparative advantage often is expressed like this:

"Each area tends to produce the products for which its ratio of advantage is greatest as compared with other areas or its ratio of disadvantage is least, up to the point where the land may be needed for some products less advantaged in the area in order to meet the demand for them at the prices that come to prevail."

This statement implies a supply-demand balance between areas. The role of demand in this process should be emphasized. An area may be capable of growing a fine crop of potatoes, for example, and yet in actual practice it will be used to grow only a fair crop of soybeans. The reason is that land capable of growing high yields of potatoes is relatively abundant in the United States and land capable of growing soybeans is not—relative to the country's need for each crop. Much land in the northern Corn Belt that would grow good potatoes therefore is planted to soybeans, which will bring greater returns. If our need for potatoes were to increase fourfold, with other needs remaining the same, some land would be withdrawn from soybeans and other crops and planted to potatoes.

AMERICAN FARMING is specialized more than farming in most countries, but this specialization does not usually express itself in single-product farming.

A combination of two or three products usually has a greater advantage in the use of land and other resources than any single product has. The seasonal nature of crop production and the uneven distribution of labor and machinery inputs open the way for special savings in dovetailing nonconflicting enterprises. Similar circumstances arise in livestock production. The interrelationships between feed crops and livestock often form the basis for profitable combinations in an operating farm unit.

Unique circumstances result in single-product specialization in a few highly specialized types of production. The

growing of cranberries, for example, requires a heavy capital investment of a kind that is not suited to other lines of production. Citrus and many other fruits and nuts tend to be this way, too, for similar reasons. Some kinds of livestock production may be highly specialized. A notable example is the commercial production of broilers. Land is a relatively small item in broiler production, because standing room is about all that is needed.

Usually we take the family farm for granted as an integral part of farm production. Yet much farm production in the world takes place under other forms of business operation. Even in the United States, about 30 percent of all farm production occurs on large-scale farms with cash receipts of 25 thousand dollars or more. Many of them could hardly be classified as family farms.

Family farming has been defined in many ways. One definition is:

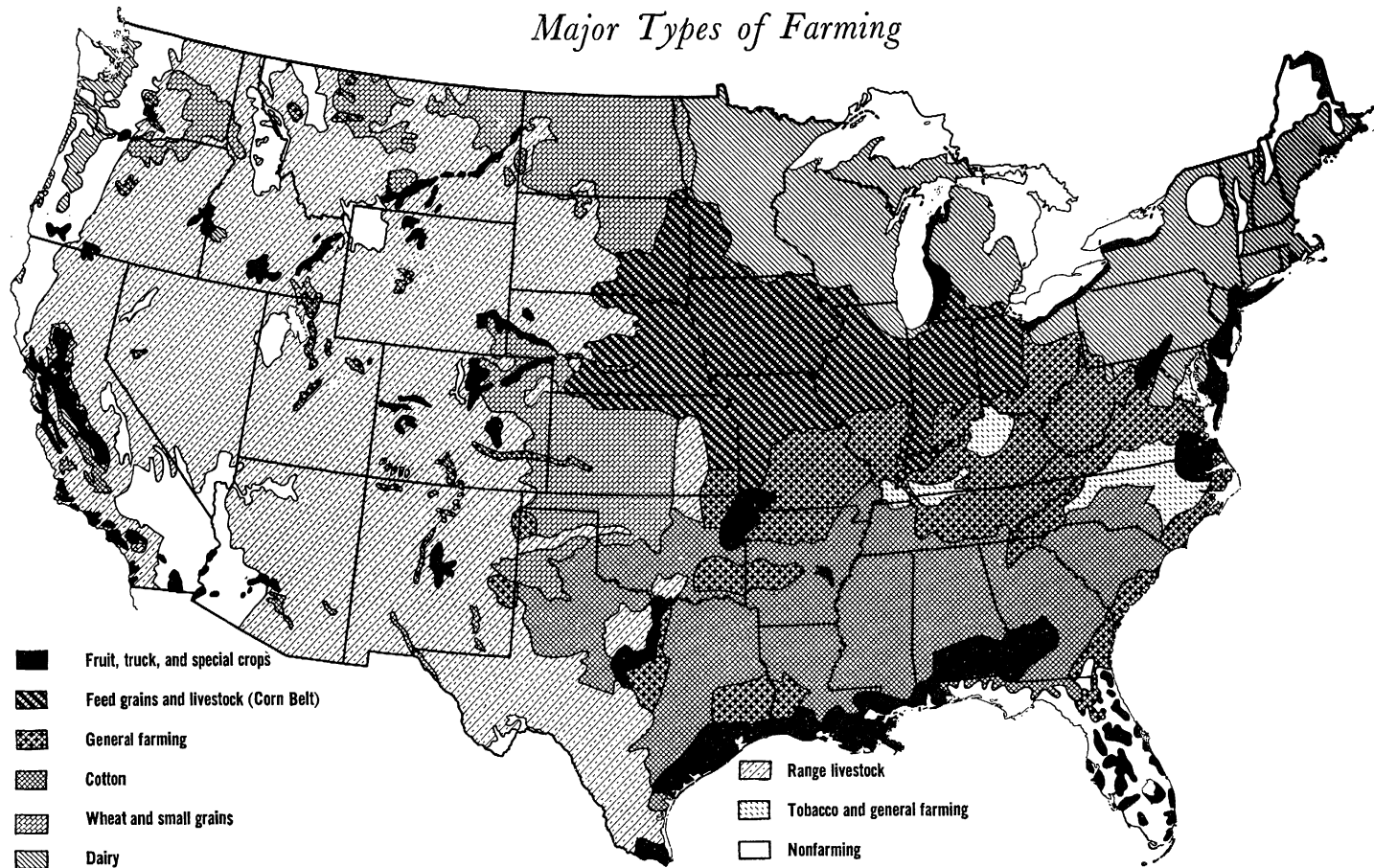
"A family farm or ranch is one which provides the main source of income for the farm family and on which the farm operator (owner or tenant) or members of his family make most of the managerial decisions, participate regularly in farmwork, and normally supply a substantial part of the labor needed to operate the farm."

This definition would include most family farm units except part-time, residential, and sharecropper units. About two-thirds of the farm production for sale comes from family farms.

The form of the farm operating unit may affect the choice of enterprises, the scale and efficiency of operation, and the comparative advantage of different farm commodities in an area. The status of the commercial broiler industry in 1958 is an example. Contracts between feed dealers or processors and farmer growers have so cushioned the risks and increased the efficiencies of operation that new specialized areas of broiler production have been built up rapidly.

Development of corresponding vertical integration in the production of fresh market eggs and in other kinds

Major Types of Farming



of farm commodities may have similar effects on the location of production and may change the comparative advantage of different areas. Bulk handling of milk and of feed grains and other farm supplies is a technological factor designed to reinforce other tendencies that may give differential advantages to some areas.

MAJOR TYPE-OF-FARMING REGIONS in the United States delineate some of the broad groupings of types of farming that characterize particular parts of the country. One should realize that these regions are only oversimplified and partial images of complex farming situations. Wide variations in type of farming occur in each region. Some of these variations have little in common with the type that appears to be most representative in a region.

The regions discussed in chapters that follow are the Northern Dairy region, the Corn Belt, the Cotton Belt, the wheat regions, the western grazing region, and the general farming region.

Of them, the Corn Belt is the most homogeneous in its agriculture, and Iowa is probably the most uniform part of the Corn Belt. Yet even in Iowa there are many contrasting types of farms. The Corn Belt probably contains within its elastic limits more highly productive land than any other area of equal size in the world.

The Northern Dairy region has rougher, less productive soils than the Corn Belt, but its cooler climate is better adapted to production of pasture and forage. That fact and the nearness of markets for fluid milk and other dairy products give it a comparative advantage in dairy production. A considerable amount of poultry and eggs is produced in the region, much of it on the specialized farms. Fruits and vegetables are grown in favorable locations.

The Cotton Belt has a long history, varied institutions, and a changing economy in which cotton has been migrating westward. In large part, the older eastern part of this belt has

shifted to other kinds of farming. Many significant changes are in progress there.

The wheat regions represent the result of a long evolution in application of modern technology to an ancient crop. Marginal costs of wheat production under full mechanization are so low as to challenge the traditional feed grains in many sections. Marked shifts in the use of land toward more permanent grass and livestock production are likely.

The western grazing region includes public and private land, much of which is suitable only for grazing beef cattle and sheep. Availability of water is frequently a limiting factor.

The general farming region includes a variety of general situations in addition to many small areas of specialized types of production like tobacco, peanuts, and fruits. Some of the general farming region lies between the two agricultural worlds of the Corn Belt and Cotton Belt.

Fruit, truck, and special-crop areas are shown on most generalized type-of-farming maps, but they are smaller areas of intensive specialization scattered so that they do not form a contiguous region. Areas along the Atlantic seaboard, on the shores of the Great Lakes, along the gulf coast, and in California offer special climatic and soil conditions that have comparative advantage for many fruits and vegetables. These areas formerly were too distant from markets, but the development of rapid transportation and refrigeration in transit has so reduced the cost and increased the feasibility of shipment as to give the more distant areas access to any of the largest markets.

The broad type-of-farming regions thus trace out the major effects of physical and economic forces. The distribution of physical resources is responsible for many of the boundaries indicated on the map—but command of modern technology and capital goods has given man control of the forces of Nature and has made agriculture more flexible.