

# FARMING ON THE URBAN FRINGE

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CITIES have grown outward into the countryside throughout our history. The displacement of agriculture has long been a feature of urban industrial development in some sections—for example, the northeastern seaboard. Now, however, the effect of urban expansion on agriculture is regarded with a much greater degree of urgency because its nature has changed and because it has become a national phenomenon.

Urbanization takes a variety of forms. It used to be confined chiefly to a gradual expansion of cities, whose outward growth was limited by the prevailing means of transportation. Improved transportation has altered the pattern to include rapid urbanization of land along arterial highways, encirclement of agricultural land, and an uneven diffusion of the urban uses over the countryside.

Rural-urban fringe areas are characterized by a shift of rural land to urban uses. The economic force of city growth on farming is more important, however, than the actual loss of farmland. One sign of it is a rise in land values and real estate tax levels, so that farmers find it difficult to expand their operations through the purchase of additional land.

The growth of the nonfarm population in formerly rural sections leads to a

demand for more public facilities and services, like new schools, roads, and water and sewer mains. The sequel is higher tax rates on property, higher land values, and a greater tax burden.

Real estate taxes on farm property are higher near cities than in predominantly rural areas.

McGehee H. Spears, of the Department of Agriculture, indicated that farm real estate taxes per acre in metropolitan counties were twice as high as taxes on farms in counties next to metropolitan counties and five times the level of taxes in rural counties in 1960. Part of the higher real estate tax burden on farms in the rural-urban fringe is due to the higher value of farm real estate. The average value of farms in metropolitan counties was nearly 300 dollars an acre and in nonmetropolitan counties slightly more than 100 dollars in 1959.

The higher property taxloads mean higher fixed costs for the farm operation. Tax increases have led sometimes to more intensive use of the land remaining in agriculture, but they have also been partly responsible for forcing land out of agriculture before it is actually needed for urban development. The amount of land forced out of agriculture often exceeds the amount moving into nonagricultural uses. It is not uncommon therefore to find temporary increases in the amount of idle land near expanding urban centers.

Although urban encroachment has proceeded rapidly, farmlands still account for most of our land resources.

The surface land area of the United States (including 369 million acres in Alaska and Hawaii) totals approximately 2.3 billion acres. Hugh H. Wooten, Karl Gertel, and William C. Pendleton, of the Department of Agriculture, have indicated that 75 percent of the total land area of the 48 contiguous States was used for crops, pasture, and range in 1959.

Special-use areas—including urban and built-up areas; parks and other extensive facilities; and farmsteads and farm roads and lanes—accounted for 139 million acres in 1959. Some lands in nonagricultural uses are excluded from this classification. Not counted among special-use areas are rural lands used for industrial and commercial sites, mining areas, quarry sites, power-line rights-of-way, cemeteries, and golf courses. In addition, special-use areas exclude the area occupied by villages and towns with populations of less than a thousand and by nonfarm residences located in rural areas.

The amount of land used for nonagricultural purposes is small compared with our total land resources. Land in nonfarm uses and wasteland comprise only about 10 percent of the total land area of the Nation.

The amount of land in special uses has increased at a substantial rate in the past decade. Messrs. Wooten, Gertel, and Pendleton estimated that rural land was diverted to nonagri-

cultural uses at the rate of about 2 million acres a year between 1950 and 1960. Approximately one-half of the rural land taken for nonagricultural uses over this period went into residential, commercial, industrial, and transportation uses. The remaining land was diverted to use for parks, wildlife refuges, national defense areas, and other extensive, nonagricultural uses.

How much additional land will go into nonagricultural uses in the future?

Prof. Raleigh Barlowe, of Michigan State University, has suggested that approximately 205 million acres of nonagricultural land will be needed for a national population of 225 million, and 226 million acres for 300 million. These projections are equal to about 11 percent and 12 percent, respectively, of the total land area of the conterminous States.

The diversion of rural land to nonagricultural uses undoubtedly will continue as our urban population grows and standards of living rise.

But, as Dr. Barlowe and others have contended, the shift of agricultural lands to nonagricultural uses will have only a modest influence on total land use patterns in the United States over the next half century.

The loss of farmland to nonagricultural uses has created some concern about our ability to provide adequate supplies of agricultural products for future generations. Because of the relatively small effect of urban expansion on the overall supply of agricultural land and continued technological advances in American agriculture, it is unlikely that underproduction will be a problem in the near future. The present status of our productive capacity is reflected by a decline in the total land in farms, notwithstanding a sizable amount of tillable land that was not under cultivation in 1963.

A shortage of agricultural land over the next 50 years is not probable. Marion Clawson, R. Burnell Held, and Charles H. Stoddard, in their study of the future land requirements of the United States for Resources for the

Future, Inc. (published in *Land for the Future* by The Johns Hopkins Press, Baltimore, in 1960), concluded that a shortage of agricultural land is unlikely for the period up to the year 2000. Rather, they have suggested that a continued excess supply of cropland is likelier in the next few decades.

More important is the influence of urban industrial development on the rural communities near expanding metropolitan centers.

We all have seen how fertile farmland is being taken for residences, commercial and industrial purposes, and roadways. But only a part of the land going into nonagricultural uses each year comes from land that was used for crops or livestock. Of the land diverted from rural uses between 1950 and 1960, 40 percent was from cropland and grassland pasture, 40 percent from forest, and 20 percent from idle land.

Estimates of the amount of farmland moving into urban uses tend to underestimate, however, the effect of urban expansion on land use patterns.

Often there is a tendency toward less intensive use of some of the land that remains in agriculture. Moreover, urban dispersal often leads to an increase in the acreage of idle land. Considered over a longer period of time, changes in land use in the rural-urban fringe are likely to involve a shift from agricultural use to nonuse and a subsequent shift of idle land and forest land into urban uses. Part of the forest land and idle land going into nonagricultural uses was used at one time for farming.

In a study of landholdings in 1960 in the northern part of New Castle County, Del., William M. Crosswhite, of the University of Delaware, and Gerald F. Vaughn, of the Department of Agriculture, classified ownership units of 10 or more acres lying outside subdivisions and incorporated municipalities. They found that agricultural ownership units contained 48 percent of the land area included in the survey. Commercial farms, though, accounted

for only 61 percent of the land in agricultural property classes. The remaining 39 percent was in residential farms, farms in the process of being transferred to nonagricultural use, and farms on which more than one-half of the cropland had been placed in the Federal Conservation Reserve Program.

Ownership units being used primarily for purposes other than farming contained 35 percent of the total acreage of cropland and uncropped tillable land in the area. Nearly half of this land was in units used chiefly as rural residences and country estates. Much of the tillable land was not being farmed. Idle tillable land accounted for 14 percent of the total land area, and cropland represented only 38 percent.

THE PROXIMITY of urban markets has been important in the development of agriculture in the vicinity of metropolitan centers.

More than a century ago, J. H. von Thünen, a German economist, studied the impact of location on the pattern of agricultural land use. He developed a theoretical model based on distance to market and commodity characteristics as the major determinants of land use patterns around an isolated central city. Other factors—such as soil, climate, topography, and transportation facilities—were assumed to be uniform throughout the area.

Von Thünen concluded, on the basis of his simple model, that the intensity of land use would diminish as distance to the central market increased. Nearby areas would be devoted to the production of bulky and perishable commodities. The more distant areas would be used for raising products that were more easily transported and for grazing.

Economic models explaining the location of agricultural production have been modified subsequently to account for variations in some of the factors that Von Thünen assumed to be constant. These models recognize the importance of distance to market and transportation costs as well as differ-

ences in other factors in affecting the location of agricultural production. Specialized areas of farming have developed within the United States as a result of spatial, natural, and institutional factors. Economists have explained the tendency toward regional specialization by what is called the "principle of comparative advantage."

Comparative advantage refers to the relative profitability of producing various commodities in different geographic areas, given the existing differences in location with respect to markets, transportation costs, natural conditions, and other factors. The principle of comparative advantage is simply a concept that indicates that farmers in a particular section will tend to emphasize the production of commodities that give them the highest net returns.

Regional specialization in agriculture cannot be attributed entirely to differences in either natural or spatial factors. Some areas may have advantages with respect to various institutional factors, such as public subsidies and tax concessions, zoning ordinances, and legal regulation of production and marketing areas. Such factors affect production costs within regions and the cost of moving commodities between various regions.

Farms near cities have realized certain locational advantages. The influence of population growth on agriculture in the rural-urban fringe is reflected by changes in land use patterns. But it is difficult to ascertain the relative importance of nearness to urban markets because of the trend toward regional specialization in American agriculture. Part of the difference between farms in metropolitan counties and those in other counties is due to the fact that metropolitan centers and urban growth are concentrated in certain regions.

Donald J. Bogue has attempted to measure changes in the amount of land used for urban purposes within standard metropolitan statistical areas between 1929 and 1955.

His findings, presented in *Metropolitan Growth and the Conversion of Land to Nonagricultural Uses* (Studies in Population Distribution, No. 11, Scripps Foundation, 1956), indicated that the land area in agricultural uses actually increased in 60 of 147 areas. The amount of increase in agricultural land in these areas exceeded the loss of agricultural land to other uses in the remaining 87 areas over the 20-year period. An increased demand for agricultural commodities because of growth of population in the metropolitan counties may have been partly responsible for the overall increase in agricultural lands.

Approximately 13 percent of all farms in the United States in 1959 were located within standard metropolitan statistical areas, which (with minor exceptions) include counties that have a central city of at least 50 thousand inhabitants and adjacent counties that are essentially metropolitan in nature and economically and socially integrated with the county of the central city. Farms in the 211 standard metropolitan statistical areas in the conterminous States in 1959 contained 9 percent of all land in farms and represented 23 percent of the aggregate value of farm real estate.

Commercial farms near cities have tended to emphasize the production of perishable products for direct human consumption. Agriculture on the rural-urban fringe has differed therefore from farming in other areas because of the disproportionately large number of farms that concentrate on the production of certain kinds of bulky and perishable products, such as milk for fluid consumption, fresh fruits and vegetables, poultry and eggs, and nursery products.

Distance to market at one time was a major factor in the competitive position of farms producing bulky and perishable commodities. New technologies in processing, handling, and storage of those products and the development of modern transportation have lessened the competitive advantage of farms near

cities. Many farms on the rural-urban fringe are still oriented, however, to local markets. And the local production of various perishable and specialty products is found on the periphery of most cities.

Comparison of commercial farms classified by major source of income indicates that 4 of the 11 major types of farms identified in the 1959 Census of Agriculture accounted for a disproportionately large number of farms in metropolitan counties. Only 12 percent of all commercial farms in the United States in 1959 were located in those counties. But metropolitan counties contained 44 percent of all vegetable farms, 36 percent of all fruit-and-nut farms, 22 percent of all poultry farms, and 17 percent of all dairy farms. Less important than in nonmetropolitan counties were livestock farms and ranches, general farms, and the various types of field-crop farms.

CERTAIN REGIONS have become noted as dairy areas because they are responsible for a significant part of our dairy production and because dairy products account for a major part of their agricultural production. The major concentrations of dairy farms are in the Northeast, the Lake States, and the Pacific Coast States. Dairy farming, however, is carried on in every part of the United States, and milk markets have developed around urban centers as a direct result of growth of the urban population.

The production of milk for fluid consumption is an enterprise on a large number of farms on the rural-urban fringes. Dairy farms accounted for 26 percent of all commercial farms in metropolitan counties in 1959. Producing milk for fresh use was restricted in earlier years to farms close to consuming centers because of the perishability of the product and the relatively high cost of transportation. The zone in which fresh milk is produced has widened over time as a result of improvements in transportation and marketing facilities. Nonetheless, farms specializ-

ing in the production of fresh milk have continued to be important in areas around urban centers. The locational advantages of dairy farms with nearby urban markets can be attributed partly to lower transportation costs and partly to the regulation of milk marketing areas.

Dairy farms in the United States range in size from small enterprises, sometimes associated with a system of diversified farming, to the large and highly specialized operations. They are characterized, in terms of the value of agricultural production, by a small proportion of very large farms and a small proportion of very small farms as compared with other types of commercial farms.

Farms producing fresh milk tend to be larger than dairy farms producing milk for manufacturing uses. This is partly a result of the sanitary requirements of the production of milk for fluid consumption, which make small-scale units relatively uneconomical.

There has been a significant trend toward larger dairy operations. The number of farms with milk cows declined by 39 percent between 1954 and 1960, but this drop was confined mostly to farms with relatively small herds. The number of farms with 50 or more cows actually increased by 41 percent.

Los Angeles County, Calif., is an example of a county that is highly urbanized and important from the standpoint of agricultural production. Most of the 6 million residents were classified as urban in 1960. Rural nonfarm and rural farm residents accounted for only 1.1 percent and 0.1 percent, respectively, of the county's total population. There were, however, 4,811 farms in the county in 1959. Around 479 thousand acres were included in farms—about 18 percent of the total land area of the county.

Although urban land pressures have resulted in the loss of farmland to urban uses, Los Angeles County is the center of the highly specialized dairy area of southern California.

It ranked first among all counties in the United States in 1954 and 1959 in volume of whole milk sold and in value of dairy products sold. The total value of dairy products sold in 1959 was 55 million dollars—about 1.4 percent of the total value of all dairy sales in the Nation.

Dairy farms in Los Angeles County are among the largest and most specialized in the United States. The value of dairy production per farm on 418 farms reporting sales of dairy products in 1959 averaged 132 thousand dollars. Most dairy farms in the county have adopted the practice of drylot dairy farming. Nearly all feed and replacement stock are purchased, and the farms are typically small in terms of acreage.

High land values are chiefly responsible for the intensive land use practices followed by dairy producers in Los Angeles County. Urban encroachment upon agricultural land has been an important factor leading to high land values and corresponding increases in real estate taxes. In addition, dairy farms have had to compete with high-value vegetable and fruit crops for the land remaining in agriculture. As a result, most of the forage fed on dairy farms in the county is produced in other counties of the State where the competition for land is less severe.

Dairy farms in Los Angeles County are not typical operations. They are much larger in terms of gross sales and more specialized than most dairy farms found in other metropolitan counties.

Dairy farms on the periphery of other urban centers exhibit similar but less extreme characteristics, however. Dairy producers on the rural-urban fringe tend to make intensive use of land as a consequence of increasing urban land pressures. This has led in some instances to the adoption of land-saving, drylot dairy farming and the purchase of most of the feed required for the herd. In other areas, where land pressures have not been so great, at least part of the feed requirement is raised on the farm.

An important characteristic of dairy farms is their relatively high labor re-

quirement. Many dairy farms depend almost exclusively on family labor, but labor from outside the family is required on the larger farms. The major labor requirement on drylot dairy farms is for the milking operation. Labor is required for both milking and the production of feed on other farms.

A study of 30 large dairy farms in Massachusetts in 1960, by Deane Lee, of the University of Massachusetts, indicated that hired labor represented more than two-thirds of the total labor force required by the farms. The average labor force on the 30 farms, each of which had dairy herds of 100 or more cows, was 6 man-equivalents. These farms had an average of 197 owned tillable acres, and 25 farms rented some additional cropland.

Another characteristic of dairy farms should be noted. A large share of the financial investment on dairy farms is in capital items other than land.

Dairy producers cannot easily shift from milk production to other agricultural enterprises because of their large investment in the herd and in specialized buildings and equipment. Moreover, increases in the size of the operation usually involve substantial increases in nonland investment. Rising land values around urban centers offer to some farmers a chance of large capital gains. But farmers forced to sell farms because of urban land pressures also may suffer capital losses on that part of their investment which is in nonland items. Dairy producers are particularly liable to those capital losses because of their large nonland investment.

POULTRY FARMS accounted for 8 percent of all commercial farms in metropolitan counties in 1959.

Farms specializing in poultry production are generally most numerous in the Northeastern States. Areas with a high concentration of poultry farms are in Massachusetts, Connecticut, Rhode Island, Pennsylvania, and the Delaware-Maryland-Virginia peninsula.

Significant changes have occurred with respect to poultry enterprises. Small flocks of chickens traditionally have been a sideline. Small enterprises, however, are becoming less common.

Vegetable farms and fruit-and-nut farms accounted for a total of 11 percent of all commercial farms in metropolitan counties in 1959. Prominent among areas in which vegetable production is highly concentrated are such diverse areas as Long Island, Florida, the lower Rio Grande Valley in Texas, southwestern Arizona, and the area near San Francisco Bay.

The production of fruit and vegetables for local markets is important on the fringe of a number of metropolitan areas. But large quantities of fruit and vegetables are produced at considerable distances from large centers.

Thus farming on the rural-urban

fringe is a complex mixture of farms ranging from small, part-time operations to large, highly specialized units. Because they tend to concentrate on the production of perishable products for direct human consumption, farms near urban markets tend to differ in some respects from farms in other areas.

The advantage of proximity to urban markets has tended, however, to decline with the development of our modern transportation system and technical advances in the processing, handling, and storage of agricultural commodities. Meanwhile, urban land pressures have increased.

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### Agricultural Employment

