

THE SPACE AGE OF AGRICULTURE

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Last October at a research farm near Minneapolis, I watched one man push buttons to feed, water and gather eggs from about 8,000 laying hens in a huge windowless air conditioned building. In Illinois I saw a demonstration of the latest device for milking cows, with everything automatic from washing and rinsing the clear plastic pipelines to pumping the cooled fluid into a refrigerated tank truck that would take it to the bottling plant. In northern Oklahoma a young man sits at a desk with a calculating machine, a pencil and a pushbutton panel to mix feed according to a variety of rations and feed it to different herds of cattle and hogs in several pens.

At the 1959 international livestock exposition and dairy show in Chicago, pushbutton farming was demonstrated in the form of a completely mechanized hog-feeding system, and devices to lift and distribute bales of hay and to clean barns.

Those are glimpses of the future, but not so far in the future, either, because pushbutton feed mixing is found at a number of feedlots right in The Farmer-Stockman territory, and the day is near when milk will move to market exclusively through sanitary bulk tank systems. And at least two mechanized poultry units, one to house 50,000 hens and another to house 120,000, are being built within 50 miles of Oklahoma City right now. They will produce as many eggs of uniformly

high quality as used to come from thousands of Oklahoma farms. That is why poultrymen with only 200-300 hens are going out of business -- or expanding their operations to meet the new challenge.

Agriculture will continue to be an expanding industry in every respect except in the number of people required to run our farms. Size of farms, output per man-hour and capital used per man are expected to increase in the next decade.

A large number of farms will go out of business in the next 10 years. One observer estimates the number surviving by 1975 to be less than half the number existing at the time of World War II.

Just how many farms and ranches are there in Oklahoma and Texas? Until the census figures are released in March and April, we won't know. But we can expect the total to be somewhat lower than in 1955. It is quite possible that Oklahoma's total will drop below 100,000, while Texas may go down to near the 200,000 mark under the new definition of a farm. If we take out the sideline farmers and the low-producers, we probably can divide those totals in half.

The change in definition of farms by the Census Bureau will, in itself, result in a marked decrease in number of farms. The minimum size has been increased from 3-acres to 10 acres, except where gross farm sales may qualify smaller tracts. There is no reason to expect a change from the long-time trends of steady declines in number of farm units under

260 acres and an increase in number of units larger than 260 acres. In other words, expect more big farms and fewer small farms when the reports are made.

The question might then well be asked whether we should broaden our coverage for a larger mass circulation to blanket all rural dwellers, or to seek some way to control circulation so that it might be limited to the type of operators who can truly be called farmers and stockmen. The answer is not yet available, but it must recognize the high probability that today's farmers and ranchers will take one of three courses during the next five years:

1. They will go out of agriculture;
2. They will increase their size of operation or improve their efficiency by more intensive operation;
3. They will become part-time farmers, depending largely upon non-farm income for their livelihood.

The loss of farmers does not mean a decline of farming, nor does it imply a decrease in buying power of those who produce our food. The farmers and stockmen who are left will produce more and spend more. Those who go out of farming or whose production drops below the minimum for supporting a family will obtain income from other sources to keep their buying power high enough to exist.

In 1958, American farms produced almost 50% more farm products

than in 1940. This record level of production was achieved with slightly less cropland and a third less labor than was used in 1940. Output per unit of labor increased by almost 120%, a record that can be matched by no other major segment of the American economy. This efficiency will continue to gain.

American farm people are less than 1 percent of the world people, yet we produce one-fifth of world's output of red meat, and over half of this was sold by the top 12 farming states.

Commercial farms of the future will increasingly assume the characteristics of a manufacturing plant. As much as three-fourths of its supplies will be bought from a growing number of businesses supplying materials and services to farmers. Businesses handling, processing and distributing farm products also will increase.

The term "Agri-business", coined by Prof John H. Davis of Harvard, is defined as: "The sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing and distribution of farm commodities and the items made from them."

By this definition our agriculture has changed less in total in the last 20 years than it has within the industry. In 1940 about one-third of our population were producing farmers and ranchers, 4 percent were engaged in supplying farmers with goods and services, while 7 percent were occupied in processing and distributing farm commodities. Now

only about 12 percent of our population are farmers and ranchers, while the number working as suppliers has gone up to 10 percent and those in the processing and distributing end has increased to about 17 percent. In each case about 40 percent of our total population was in agriculture.

The key to the revolution which has taken place in agricultural production since 1940 has been the substitution of capital for labor, says Gov. R. B. Tootell of the Farm Credit Administration. He points out that since 12 percent of our people provide our food and fiber needs with considerable to spare, the other 88 per cent of our labor force is available to produce the goods and services that give us our high level of living and make us the world's industrial leader. A nation that needs most of its labor force to supply its food can never enjoy such high standards of living. Our successful agriculture will keep our standards of living high in the years ahead.

No shortage of food is in sight and there is a good chance that we may have "over-production" in the United States for at least 20 years, although our population is growing steadily.

A recent issue of Dun's Review and Modern Industry said: "A fairly conservative estimate is that in the 1960's our population will grow by about 34 million, roughly equivalent to the total present population of Canada, Cuba and Australia combined. This means a tremendous new market, not only for construction, but for nearly everything else."

Other Census projections indicate that we may have as many as 230 million people by 1975. So economists say farmers will have to produce an average of 35 to 45 percent more to meet the needs of 1975. Experts foresee an increase of 18 percent in total domestic consumption of food and nonfood products up to 1965 and of about 50 percent by 1975. The demand for cotton is expected to be 55 to 60 percent greater in 1975 than in 1958, despite competition from synthetic fibers. By 1975 demand for fruits and vegetables is expected to increase by more than 50 percent.

Farmers will have increased competition from industry-made substitutes for farm products and from foreign countries. Export markets will not likely develop to absorb all we could ship abroad, simply because no nation on earth wants to depend on another nation to produce its food.

Without new technology but using the same methods and techniques now in use, Dr. Byron T. Shaw, USDA agricultural research service, says that 714 million acres will be required to meet the food needs of this nation by 1975, an increase of 308 million acres. But by putting present unused new knowledge to work, increases equal to the production on 160 million acres can be obtained. He thinks the remainder of the increase can readily be met by bringing into use new cropland and new technology that can be developed through research laboratories by the time it is needed.

Farms may be expected to double in size and income within a few years.

Automation will be universal in the livestock and poultry business, where feeding, watering and cleaning chores will be handled by electricity. Hogs will be raised from herds of 100 or more sows; and steers will be fed in lots of 500 or more. The number of farms selling milk and cream may decline in another 10 years, as low as 1/2 million. At the present time, 260,000 2-man dairy farms averaging 50 cows and 10,000 pounds of milk per cow would supply more milk than is being used.

Meat animals will provide most of the increase expected in livestock production next year (1960). Cattlemen added 3 1/2 million head to their herds last year, probably are adding 5 to 6 million in 1960.

Larger equipment for growing row-crops is ahead. Some of it will be 6 to 10 row units. Other advancements will include machines to prepare the soil, plant, fertilize and treat for weeds in one operation. Machines are not far in the future for harvesting, drying and pelleting hay in the field.

Among crop improvements we look for dwarf corn that will be grown in narrow rows, setting 6 to 10 ears per stalk and harvested by combine. Shorter, stiffer strawed varieties of small grain are being developed that will permit heavier fertilization and yield as high as 100 bushels per acre.

Research will bring many changes in the scientific treatment of soils, crops, livestock and livestock rations, with industry-owned laboratories crowding the public institutions for leadership in these fields. Farmers and stockmen will be pushing both of them for new knowledge that may enable them to produce more at less cost.

The use of chemicals has greatly stimulated the increased per-acre yields of some crops for which government acreage control programs were in effect.

New techniques for drying, powdering, concentrating and refrigerating perishable foods will provide more stable markets for them.

Water will assume greater importance, as irrigation spreads to diminish the risk of crop failure due to climatic fluctuations. Observers forecast the time when sea water will be de-salted for use by municipalities and industries, leaving more of the other water resources available for agricultural production.

Farmers will buy large amounts of items that were either unknown or very unimportant just 20 years ago, plus new ones not yet available. Included would be liquid fertilizers, DDT, 2,4-D, forage harvesters, pick-up balers, self-propelled combines, cotton pickers, lightweight irrigation pipe, sprinklers, antibiotics, hormones and a wide variety of mineral trace elements. Once farmers used to dole out fertilizer, thinking how much it cost them. Now they pour it on by the carload, confident of

getting bigger profits at harvest time.

Farmers will be more anxious than ever to adopt new techniques equipment and production materials to gain the temporary advantage that comes to early users of new efficiencies.

New technologies which permit the concentration of animal production into large units and increase our feed supplies are being adopted rapidly by farmers. No longer are farm operators satisfied with the rate of return which is possible today from the smaller units of yesterday.

The introduction of modern technology and automation to agriculture has been described by one observer as "complication"--- a system that enables us to do more things more easily, more comfortably and more safely than ever before." Our shifting balance of population shows that each year fewer and fewer people grow more and more agricultural products for more and more people---and it is complication that makes up this manpower difference.

New techniques that may increase production or reduce costs will be adopted more rapidly in the future. Failure to do so will drop the slow operator farther behind in the highly competitive markets.

Less than one-fourth of our total farm product going to market comes from the three-fourths of farmers at the lower end of the production scale. Many of these low-producers will go out of farming business and others will boost their production.

Output per man-hour is expected to increase by as much as 35 percent in the next 10 years, and the demand for capital by the individual farmer will more than double. It already takes five dollars to do what one dollar did for the farmer in 1940.

Capital requirements of a successful farming operation have been greatly increased because of the need for a variety of expensive, labor-saving equipment, from the use of more purchased materials, fuel, power, seed, feed, fertilizer and other things, and from the need for a larger investment in land and buildings.

Total agricultural assets are at an all-time high, \$203 billion. Total farm debt is only 11 percent of agricultural assets. Farm people will spend over \$40 billion a year on producers' and consumers' goods and services, 3 1/2 times as much as they spent two decades ago.

The average of all production assets per farm worker more than doubled in the last 10 years, from \$9,625 in 1950 to \$20,651 in 1960. The average per farm went to \$33,455, not quite double. Both will go higher.

Food production, processing and distribution are being integrated into a gigantic assembly line operation. To handle the huge increase in crops, farmers will have to mechanize almost every farm job. Farmers now own 12 times as many work-saving machines as they did in 1945, mostly with machines invented since 1938, and they will buy more.

Farmers will spend about \$1.2 billion on gasoline and oil each year.

Agriculture will continue to need large numbers of hired workers despite current trends toward larger farms and fewer farmers. This is due to a growing demand by an expanding population for farm-produced food and fiber; mechanical difficulties in adapting labor-saving equipment to certain crops and certain areas; and wage rates in some farming areas that compare favorably with the costs of buying and operating labor-saving equipment.

Tenant farmers who remain in business will have most of their capital invested in modern equipment, and that probably will amount to more than it took to buy and equip a small farm just a few years ago. They will be able to rent odd pieces of land, supplementing income by custom work on adjacent large farms. The number of "part-time farmers", people who work in town and farm on the side, may grow but they will not figure largely in production as compared to full size commercial units.

Although farmers maybe running a year or two behind on their marketing and two or three years behind on their profits, they have to plan this year's crops and next year's crops on the basis of what they think next year's supply may be like. Planning decisions now affect next year's market supplies.

The problem of what to grow on land not needed for production of wheat, cotton, rice, truck crops, peanuts and other surplus crops will plague Texas and Oklahoma operators for years to come. To date, the best answer appears to be livestock in most areas. The outlook for an expansion of livestock feeding to slaughter finish in the plains appears favorable. The grain sorghum-hog ratio in Texas was more favorable than the corn-hog ratio in Iowa in eight out of the 11 years, 1949-58.

The introduction of new crops to Texas and Oklahoma, crops such as sesame, guar, safflower and others, is helping to meet the demand for increased income. However, the gross and net return from these crops generally is somewhat less than the per acre yield of wheat, cotton, grain sorghum and peanuts. Farmers will grow the new crops to fill out but will return to the staple commodities at the earliest opportunities. The Farmer-Stockman is undertaking to help farmers find ways to build up income from these sources.

One way we are doing this is by encouraging the establishment of market outlets in an area. One obstacle is the fact that dependable markets require large volume of production, year after year, while a market must be assured before the production can be obtained. We are co-operating with industrial development groups in various regions to help bring the two requirements to a focal point that will benefit producers and build an industry at the same time. We feel that we are

making some progress in this direction. Certainly, the marketing of agricultural commodities is one of the most vital topics that we are now writing about in *The Farmer-Stockman*.

"Management now is the key to successful farming and ranching," says John E. Hutchison, director of extension at Texas A & M College. "The rewards for good management have never been greater nor the penalties for mistakes more severe than they are today."

The need for a higher order of management skills to direct the planning and operation of the typical modern farm business is obvious. Well-thought out programs will be needed to use available manpower and equipment effectively, formulate a financial budget, keep necessary records for programming and tax purposes.

Pricing of agricultural commodities will be less competitive in the future, as market levels will be increasingly negotiated in advance, either by contracts, marketing orders or by government influences, such as price supports.

Agriculture will get a smaller percentage of the much larger national income but individual farm incomes and standards of living in relation to other occupations will be higher than they are now.

A large part of the drudgery type of farm work has been eliminated from farms by extensive substitution of equipment and mechanical power for manpower.

Consumer preferences will become more direct influences on the output of farm commodities in the future than now. Competition among different commodities for consumer dollars will be intensified, with a larger part of the food expenditure going for processing, cooking, preparation and packaging, and a smaller percentage going to pay for the raw materials as they come from the farm.

Although expenditures of farm families have normally run less for personal consumption than comparable urban families, the trend will be toward larger expenditures.

The farm family today is mobile and accessible to the most modern distribution outlets. The farm wife will buy more and more in supermarkets and be a prospect for the same modern household conveniences as are found in urban homes. The homemaker of the future will handle more money, operate more home appliances, follow new developments in nutrition, housing, furnishing and clothing more closely and have more time for cultural and social activities than in the past.

Urban families generally buy only for their own personal use, because goods and services used in production usually are bought by their employers. Farm families represent a major market for producer goods as well as for consumer goods, with purchases of both types being made by the same families.

For many years, the farmer-stockman advocated that farm families make their farms as nearly self-sufficient as possible. They relied upon the cow, sow and hen to supplement their gardens and orchards rather than upon the supermarket to supply their tastes. It succeeded for years but the subsistence farms that provided their own living are rapidly disappearing. If all farmers grew their own food, it would be less than 12 percent of our total and experts predict that by 1970, only 2 or 3 percent of the food eaten by American households will be homegrown. Bottled milk and fresh egg delivery on rural routes near cities is now common, while the ancient art of canning and preserving is becoming an obsolete skill of farm homemakers.

Dean Earl Butz of Purdue says: "Agriculture is changing from a way of life to a way of making a living, from a business of arts and crafts to a business of science, technology and management. Farms of the future will be operated by managers smart enough to make money in spite of the government's efforts to save them."

The inheritance tax will force agriculture into corporate structures of ownership. A "landed class" of people may develop, because of the difficulty of going into farming. Inheritance will become the most important factor in determining whether a young man will have a career as a farmer. Sons don't always inherit the vocational preferences or managerial skills that their fathers had.

Since the pressure to expand individual farms will be continuous,

farmers will find more use for purchase agreements, family partnerships and corporations, with part-owners becoming more common.

Diversification will give way to specialization as farmers concentrate their capital and resources on a few products to meet demands for graded quality, large volume and precise delivery dates. Margins of profit will be narrow and small producers will have trouble selling to advantage. Buyers will be fewer, too.

Producers of perishable commodities and perhaps certain others will be part of an integrated industry where many of the important decisions regarding technology and marketing will be made by persons providing the capital and marketing services rather than by the producer. Commodities grown under contract will be produced to market specification.

Contract farming will continue to expand, with experts anticipating greatest increase in the south. Vertical diversification, meaning simply the extension of operations in producing and marketing a commodity, will also be spread over a wider area. More producers, processors, marketers and suppliers will expand their narrow-profit operations to try to grow a little more of the consumers' food dollars.

Although contract farming may never become a part of most farms, its operation on others will affect the management and marketing decisions of all farmers.

The absorption of more than a million acres of farm land annually into superhighways, airports, shopping centers and suburban housing

developments will continue. More cities will grow together along the main roads as the American countryside disappears. This may lead to more extensive zoning of land uses to protect rural property owners from encroachment of undesirable developments, but placing agriculture under additional regulation.

Farming is no longer to be regarded as a politically-convenient sociological institution upon which all the ills of our economy may be blamed. Farming in the future will be regarded as a business; not just a way of life, except where politics and vested interests may be concerned.

The loss of political power because of the decreased number of farm operators cannot be overlooked. The oratorical interest of public officials in agriculture may follow the path of more controls and regulation of the larger units rather than the time-worn path of trying to keep everybody on the farm who wanted to farm.

Farming and farm life are becoming more fully integrated into our basically urban economy, resulting in a synthesis of cultures, often with no distinct boundaries. Farm homemaker and city housewife shop in the same stores, their children attend the same schools, and the families attend the same churches and often the same clubs as they become increasingly interdependent upon one another.

This will tend more and more to separate the business of farming and family living on commercial family farms, while more and more

members of the farm families will be employed in urban occupations. Many farmers already belong to labor unions as a result of city employment, and unions are trying again to organize farm labor.

Because farm population is still increasing steadily, we must expect at least half of the young men and women to move from the farms into the cities for employment.

Off-farm income will become increasingly important even to commercial farm families and essential to smaller operators.

The low-income families of rural areas have not been and probably will not be greatly helped by the so-called farm price stabilization programs. They simply do not have enough production to sell for any price, no matter how high, to return them enough dollars for adequate livelihood. Underemployment and underutilization of farm resources are basic problems that apparently can be solved only by industrial development to provide non-farm employment opportunities.

A recent report on ownership of land in the Great Plains, which includes a substantial part of The Farmer-Stockman territory, shows that 99 percent of the privately owned agricultural land is in some agricultural use. Corporations make up less than 1 percent of the owners and hold about 8 percent of the farm and ranch land. Husbands and wives own 49 percent of the land, while other types of partnerships own another 10 percent.

More significant is the fact that 30 percent of the owners are

past 65 years old and that 45 percent of the owners do not live on any of their farm or ranch land and less than half are active farmers. This and other ownership or operational patterns that may be revealed by the agricultural census now being taken will have considerable bearing upon the type of readership that we may expect to obtain and offer to our advertisers as an audience for their messages.

Summing up, in the future there will be

Fewer farms but bigger farms,

Fewer farmers but larger operators,

Less work and more automation,

Less subsistence and more expansion,

Less diversification and more specialization,

Broader scale production and narrower profit margins.

We have come now to the **SPACE AGE OF AGRICULTURE**. The population explosion that is occurring in the cities is demanding more space to expand and people, houses and stores are spilling out all over the countryside. Cities need and want more space. To acquire the needed space, land prices are being bid up to new high levels. This affects farmers and ranchers who also are looking for more space to expand. They must grow more and produce more if they are to stay in business. They need more space, too. They're in a fierce competitive battle with each other and with the cities for the space needed.