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## *Adjusting Land Inputs and Use Toward Production Control and Increased Returns to Farmers*

**T**WENTY CHAPTERS have been presented on various technological and economic aspects of land use and its relation to the problem of disequilibrium in the farm industry. In the aggregate, they represent a prodigious volume of ideas, hypotheses, facts and projections. My assignment is to summarize and comment on this mass of material.

### FARM PROBLEM

The farm industry is in serious economic difficulty. On this there seems to be general agreement among the authors. It is characterized by surpluses, low prices and disparities in income-earning opportunities. These, however, are but the outward manifestation of a more basic problem — an excess supply of resources. The amount of disequilibrium created by such forces as rapid technical progress, changing input prices, growth in per capita income and a decline in export demand has been more than the industry could digest. While adjustments have been taking place at a fast pace, the rate of resource adaptation has lagged far behind the rate of disequilibrium creation. As a result, we have an industry that is producing too much output at too high a total resource cost.

The level of output is excessive in the sense that it cannot clear markets at a level of prices that will permit comparable returns to labor and capital on well-organized farms. If markets were allowed to clear, returns on such farms would fall substantially below opportunity cost levels. In producing a more optimum level of output, fewer resources will be needed.

Because of outmoded technology and inefficient resource combinations, resource costs per unit of output are extremely high on many farms. As a result, total farm output could be increased significantly, even with some reduction in total input and no new

technical knowledge. Fewer resources also will be needed if the present level of output is to be produced at a total resource cost approaching the feasible minimum. This condition is one of the chief obstacles to effective production control via a modest reduction in inputs. I am inclined to disagree with the view expressed by Tolley (Chapter 20) that this is a relatively unimportant kind of inefficiency in agriculture.

In brief, this seems to be the present situation. Without special programs, is it likely that the problem of excess resources will disappear with the passage of time? Several chapters have focused on future technological and economic developments. What impressions do they leave?

### LONG-RANGE OUTLOOK FOR THE GENERAL ECONOMY

Knowles (Chapter 2) presented a number of projections of gross national product. They suggest that the future rate of potential growth is high, appreciably higher than the historical rate. Real gross national product in 1975 could be nearly 90 percent greater than the level in 1959. In the year 2000 it could exceed the trillion dollar level.

The realization of these levels will require, among other things, a sufficient expansion in aggregate demand to maintain full employment, and a high capacity for resource adaptation. This kind of growth is likely to have a big impact on the structure of demand for resources.

The assumption of a maximum level of unemployment of 4 percent may be somewhat optimistic. Although the chances of a really serious depression are pretty small, the probabilities of some significant departures from full employment appear fairly high. Nevertheless, the long-range outlook for a high and reasonably steady rate of increase in per capita income is bright.

### OUTLOOK FOR FOOD AND FIBER

The demand for food and fiber in the years ahead will continue to expand with the growth in population and rising incomes. However, the upward trend in per capita income is likely to add a declining increment to demand because of the diminishing income elasticity for food.

The growth in per capita income also will modify the pattern of demand for farm products. Demands for the higher income elasticity products such as meat and poultry will expand faster

than the demands for the lower income elasticity products such as eggs and milk. Inasmuch as the income elasticity for cereals and potatoes is apparently negative, the demands for these products will increase only as long as population growth offsets the effect of rising income. Population growth is likely to be rapid enough to expand the total demand for these products, but the rate of expansion will be smaller than for most farm commodities. So much for the qualitative aspects.

The projections presented by Koffsky (Chapter 3) indicate that with a medium population increase, farm output in 1980 would need to be about 45 percent larger than in 1958 to meet projected requirements. This is equivalent to an annual rate of increase in total requirements of about 1.75 percent. In 1980 domestic use would be up 68 percent for meat animals, 49 percent for dairy products and only 33 percent for cereals and potatoes. Farm exports in 1980 are projected to be 27 percent higher than in 1958.

Two additional effects of rising incomes should be noted. As a result of the higher income elasticity for the services associated with food, the proportion of the consumer's food dollar spent on farm products is likely to continue its downward trend. Again because of differences in income elasticities, growth in per capita income will increase the demands for nonfarm products more than the demand for farm products. In the competition for resources, nonfarm industries will be in a position to outbid the farm industry. Unless offsetting factors come into play, this is likely to mean some continuous cost-price squeeze in farming.

As pointed out by Koffsky, the range of possibilities in projecting long-run demands for food and fiber is large. Different assumptions about the rate of growth of population can have a big effect on the level of requirements. Apparently some of the recent demographic developments are prompting some speculation about the continuation of the high rate of population growth.

What is the outlook on the supply side? Here the uncertainties are even greater, partly because less is known about the supply function than the demand function, and partly because there is less basis for predicting the future levels of the variables entering the supply function. Until we can do a better job of explaining past changes in farm output, there is little basis for projecting future output. This is a research job that will require the joint efforts of physical scientists and economists. A breakthrough is badly needed.

The consensus of the authors seems to be that farm output will continue its upward trend in the absence of a more vigorous public effort to restrain the forces of expansion. This is a reasonable expectation in view of (1) the size of the technological gap

and the possibilities of tightening internal efficiency in the farm industry, (2) the likelihood that more resources will be poured into research, (3) the high rate of transformation of research resources into improved production methods and (4) the continued improvement in the quality of the labor-management input.

On the crucial question of the rate of increase in output, one can find more diversity of opinion. Over the short run, say 5 to 10 years, the balance of professional judgement seems to support the view that farm output will continue to grow at a rate at least as high as that of the recent past. The studies of production, prices and incomes under conditions approximating free markets, conducted in the USDA and Iowa, gave results that are reasonably consistent with this view. The presentations by agronomists do not seem to contradict the belief.

For the longer run, the range of opinion widens considerably. Some argue that because of non-repetitive factors, the longer term rate of expansion is likely to be less than that of the recent past. I gather from Bressler (Chapter 13) that he is still inclined to this view. On the other hand, it is not hard to find other competent scientists who will argue that the rate of technical progress is rising, that we are on the verge of important new discoveries which will greatly expand our capacity to produce and that the technological gap is becoming smaller and smaller. Obviously, we need more research on which to base projections of future output if these conflicting beliefs are to be resolved.

With respect to comparative rates of growth of output and demand in the absence of effective control programs, the consensus seems to be that supply will continue to press heavily on demand for at least a decade. Present output capacity probably exceeds the current long-run equilibrium level by 6 to 8 percent. Thus, it would take several years for demand to catch up, on the assumption that output remained at recent levels. Even if output were to grow at a slower rate than in the past, this would add several more years. If at the same time stocks were to be reduced to more normal levels, the time at which supply and demand were brought into balance at a long-run equilibrium, prices would be pushed still farther into the future.

## OUTLOOK FOR OTHER LAND-USING ACTIVITIES

A growing population and rising per capita income also will expand future demands for recreational facilities, forest products, transportation service and space for living and conducting business. Apparently the income elasticity of demand for most of

these goods and services is moderately to substantially higher than for food and fiber. The income elasticity for recreation services is especially high. Thus, future demands for these things might be expected to grow more rapidly than the future demand for farm products.

The supplies of outdoor recreation facilities, forest products, transportation services and space for urban development are determined to a large extent by the actions of public bodies. It is undoubtedly true that our political machinery is less efficient than the price system in providing increased supplies to meet increased demands. The situation in education is perhaps a good example. Thus, the amount of resources devoted to the production of those public goods and services experiencing secular increases in demand may be substantially less than the economic optimum. This seems to be especially true with respect to outdoor recreational facilities.

Clawson (Chapter 4) presented projections of land needs for recreation, transportation and urban development for the year 2000. Adding these figures together gives a total land need of about 115 million acres. This is equivalent to an annual rate of increase of about 2 percent. If these requirements were to be met, it would mean that in the year 2000 the amount of land devoted to these activities would be more than double the level of recent years.

Held's figures (Chapter 14) are for 1985. He puts the total for that year at about 65 million acres. The amount of cropland involved is estimated at only 16 or 17 million acres, however.

The projections for forest products given by Hopkins (Chapter 10) are for the year 2000 and are based on a Forest Service study. For the medium level of consumption they show a 45 percent deficit in total growing stock and a 76 percent deficit in saw timber. While I have some reservations about these figures, they are suggestive. These gaps were not translated into land requirements. However, I gained the impression that a large part of the projected deficits might be met most economically by additional investment in and better management of existing forest lands. This view seems to be reasonably consistent with that expressed by Held (Chapter 14).

#### LAND REQUIREMENTS PER UNIT OF OUTPUT

A number of the authors have recognized that the amount and quality of land used per unit of output varies widely among the principal land using activities. In order to gauge the future

structure of demand for land, one needs to know, among other things, both the future structure of demand for the products of land and the future production coefficients — how much of what quality land will be used per unit of each kind of product.

Heady (Chapter 1) stressed the point that the amount of land used per unit of farm production has been declining over the years. Advances in farm technology have raised the marginal productivity of capital relative to that of land and encouraged a substitution effect. Since 1940 the substitution of capital for land has also been stimulated by a relative decline in the price of capital. These developments have tended to reduce the relative demand for land in farm production.

I am not aware of any comparable changes in the production of other important land-using products. Undoubtedly, there have been some, but none perhaps as dramatic as the developments in farm production. However, there have been some improvements in other land-using activities that have had the opposite effect. For example, the development of bigger and faster airplanes has required larger landing fields.

## LAND POLICY GOALS

In part, this volume has been concerned with the specification of needed land use adjustments. Such an activity implies some image of an optimum, or at least a more optimum, allocation and use of land resources. This requires, among other things, the identification and ordering of policy goals. In view of this, it is somewhat surprising that more attention has not been given to the goals of land use adjustment. Tolley (Chapter 20) does the best job on this score.

What is society trying to accomplish in land policy? Are the goals competitive and/or complementary? What are the relations between the goals of land policy and other policy goals? What are the marginal rates of substitution? The answers to these questions are necessary for the rational programming of land resources.

It is reasonably clear that recent land policies have involved a number of goals, including regional development, higher farm income, conservation, economic efficiency, distributive justice and family farming. It is equally clear that the effort to achieve all these goals via land policy has produced some serious inefficiencies. For example, the policy of encouraging short-run output-increasing capital investment in land on grounds of conservation and regional development has been working at cross

purposes with the policy of reducing farm output through land retirement.

There seem to be two goals especially relevant to the subject matter of this volume: (1) the social goal of achieving a maximum real national product and (2) the farm policy goal of achieving a solution to the imbalance problems of the farm industry. These goals are implicitly or explicitly recognized in a number of the chapters dealing with land use adjustments. However, it makes some difference whether one approaches the problem of land use adjustment from the viewpoint of national income or from the viewpoint of surplus farm production.

If the approach is from the standpoint of national income, the critical questions are: (1) what adjustments in land use will contribute most to increasing the national income and (2) to what extent will these adjustments contribute to the solution of the output imbalance problem of the farm industry?

In approaching the problem from the viewpoint of farm surpluses, the principal question concerns the amounts and qualities of land that need to be removed from farm production to balance supply and demand at "satisfactory" prices. By and large, this is the approach of the Soil Bank and other proposals for land retirement. A secondary question sometimes raised in connection with these proposals is how the land retired from farm production can best be used to enhance the national income.

### NEEDED LAND USE ADJUSTMENTS

Both approaches are likely to give some of the same land use adjustment answers. Given the technological and economic outlook for the 1960's, it seems clear that the amount of land devoted to farm production should be reduced. Likewise, the proportion of farm land devoted to labor and capital intensive crops should be decreased, whereas the proportion devoted to hay and pasture should be increased.

From the viewpoint of national income, the land withdrawn from agricultural uses should be employed in other land-using activities which have a greater value productivity. Most of it probably should go into recreational uses, much smaller quantities into urban development and forestry and a very small amount to transportation. However, most of the proposals to reduce farm production through land retirement make no provision for getting land withdrawn from agriculture into more productive nonfarm uses.

When it comes to the matter of quantities, the two approaches

are likely to give quite different results. If one starts with the question — how much land should be taken out of farm production to solve the output imbalance problem — the answer will involve an amount of land withdrawn from farm production which is almost certain to be larger than the amount that would be withdrawn to maximize the real national product. The reason is clear. More of the output-reducing effect will be induced by the decrease in land input and less by the decrease in other inputs.

Heady (Chapter 1) and Chryst and Timmons (Chapter 17) made the point that land use adjustments cannot be specified independently of adjustments in labor and capital inputs. If we reduce farm output to the equilibrium level by withdrawing land, there is a range of possible effects on the input of labor. If whole farms are withdrawn, the reduction in labor input per unit of land withdrawn will be equal to the average ratio of labor to land on the farms taken out of production. This method is likely to induce the largest reduction in labor input. Toward the other extreme would be a land withdrawal program that distributed the reduction in land input among all farms. This type of program is likely to have little effect on labor input.

But even in the most favorable case — that of withdrawing whole farms — the reduction in the amount of labor is likely to be too small in relation to the reduction in land input for the most efficient residual combination of resources. The farms withdrawn from production are likely to be units with too high a ratio of labor-to-land for low-cost production, partly because of selectivity effects and partly because there are many more of these farms.

For years, farm management specialists have emphasized the importance of having an adequate land base in achieving a well-organized unit. However, if farm size is to be increased, it means that the ratio of the reduction in labor input to the reduction in land input must be greater than the ratio of labor-to-land on the average farm. Only then will more land be available per unit of labor. What seems to be needed from the standpoint of national income is a relatively large reduction in labor input and a small reduction in land input with heavy emphasis on more extensive use of agricultural land.

A land withdrawal program may affect national income in another way. If land is simply retired from all productive use, it makes no contribution to the national product. From the standpoint of national income, it is better to produce food that has some value than to produce nothing. Of course, if people attach a lower value to the increment in food than they attached to the increment of other products that could be produced with the resources, it is even better to produce the increment of other products.



During the 1960's a land withdrawal program of the size needed to reduce output to an equilibrium level is likely to involve more land than can be efficiently employed in other major land-using activities. Undoubtedly, some land needs to be re-allocated from farm production to these activities on the ground of increasing the national income. However, this amount is probably small in relation to the quantity that would need to be withdrawn from farming to achieve an equilibrium level of output. If more than this amount were allocated to these uses, the marginal social cost would exceed the marginal social benefit. In terms of national income, too many resources in these employments can be just as bad as too few.

While land retirement might rate as only a "third or fourth best solution" from the standpoint of national income and its distribution, it undoubtedly rates higher in terms of political acceptability. Moreover, if properly designed, it could make some positive contribution to needed long-run adjustments in resource use in the farm industry. Egbert and Dumenil (Chapter 11) present some useful ideas and information along this line.

If a land retirement program is to make its maximum contribution to needed resource adjustment, land should be withdrawn as whole farms in areas at the extensive margin. However, such a program is likely to magnify the secondary adjustment problems in areas of heavy land withdrawal. These problems have been pointed up by Ottoson (Chapter 19). For this reason, many people in these areas are likely to oppose this kind of land retirement program. It now appears that if Congress does provide for a big increase in the Conservation Reserve, it is likely to emphasize land retirement on all farms. While this might be more acceptable at the moment than other variations, it is also likely to be the least efficient alternative and the most difficult to make effective.

Raup and Learn (Chapter 16) presented an interesting analysis of the land use effects of a generalized marketing quota program with salable marketing certificates. This type of program is likely to give more effective control over market supplies than a land retirement program. However, the output-reducing effect is achieved in the same way — by unemploying or underemploying resources. The big difference is that the input of land is likely to be cut back less, and the input of labor and capital more, with a generalized marketing quota program. Within the farm industry, the forces of competition would still determine the allocation of output and input among producers.

From the standpoint of national income, its chief weakness is its failure to provide any effective mechanism for getting unneeded

land, labor and capital in agriculture re-employed in more productive nonfarm employments and for easing the stresses and strains associated with such an adjustment. Moreover, it is likely to provide the most benefits for those who already have the highest incomes. On this score, it falls in the same class as other programs, including land retirement, which distribute the increase in farm income among individual producers in almost direct proportion to the amount of resources owned and controlled.