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FARM *and* FOOD POLICY

BUNCE—

Using Our Soils For War Production

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FARM *and* FOOD POLICY

Pamphlet No. **7** *in the Series*

USING OUR SOILS FOR WAR PRODUCTION

by

ARTHUR C. BUNCE

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WARTIME FARM AND FOOD POLICY SERIES

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To mobilize our nation's giant strength for war necessarily means a drastic readjustment in our ways of producing, distributing, and consuming everything we make. A few laggards, and people working at cross purposes, can slow down the whole nation if government authority is not used to bring them into line. But authority is not a substitute for public understanding and acceptance. As a matter of democratic principle and of efficiency, the citizens must know what has to be done in economic mobilization—and why and how. This series of pamphlets, prepared by members of the Department of Economics and Sociology at Iowa State College, deals with the what, why, and how of agricultural policy and food management.

Previous pamphlets have outlined the broad relations of food to the war effort and sketched techniques of dividing food supplies and getting maximum production. The use of farm prices to obtain the kinds and amounts of food production needed, the mobilization of necessary farm labor and a food rationing program to maintain a high level of morale have been examined in detail.

This pamphlet, "Using Our Soils for War Production," deals with the problem of how we can get the most out of our soil resources and at the same time avoid serious losses through erosion. The dominant theme is the development of a unified production and conservation program in agriculture.

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USING OUR SOILS FOR WAR PRODUCTION

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SUMMARY*

Agriculture faces the necessity of cropping farm land more heavily in the years that lie ahead. To do this with a minimum increase in soil erosion means that we must plan now to use our soils according to their susceptibility to erosion. Our present production programs are not designed to do this, and a unified production and conservation program must be developed immediately if we are to meet present needs without wasting our soil. The basic elements of such a unified program are as follows:

1. To obtain the greatest production during the war we must now draw upon some of the reserves of soil fertility.
2. In order to avoid unnecessary destruction of our soil assets we must use most of our level nonerodible soils more fully for producing erosive crops such as corn and soybeans. To do this, all restrictions on soil-depleting feed crops should be removed. This has not been done by the AAA as yet.
3. In areas subject to erosion, production can be increased by feeding more livestock, by increasing yields of pasture and hay, and by expanding the acreage of erosive crops *under special erosion control practices*. Removing restrictions on soil-depleting crops without taking other steps may result in an overexpansion of these crops on sloping land and an unnecessary waste of soil resources. Feed should be shipped

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into these areas and made available to farmers on suitable credit terms, and the adoption of soil management and conservation practices that increase yields should be encouraged.

4. The level areas not subject to erosion and suitable for growing corn have the highest corn yields and the most power equipment. Thus, labor applied in expanding corn and other erosive crops in these areas is more efficient than an equal amount expended on these crops in the areas subject to erosion. Therefore, only after the level land is being used for maximum crop production should any remaining labor be used for increased livestock production in these areas. On the other hand, increased production of livestock should have the first call on labor in the areas subject to erosion.
5. Because erodible and nonerodible soils are mixed on many farms, and because labor and equipment vary, it is essential that farmers and government cooperate in developing production plans on an individual farm basis. Such plans must be flexible and related to the physical and human resources available. AAA policies should be directed to this end.
6. In order to relate crop production to the erodibility of the soil, a simple set of land classes and land use practices should be established. The Soil Conservation Service and the Experiment Stations are best equipped to determine these classes and standards and to suggest the erosion control practices that should be associated with increased acreages of intertilled crops on erosive soils.
7. In order to direct and stimulate production expansion into the most efficient channels, subsidies for specific increases of required crops, livestock, and erosion control practices should be further developed.
8. A wartime emergency program of this nature should lay the foundation for a permanent conservation and agricultural adjustment program for the future.

INTRODUCTION

The problem of using our soils fully in the war effort is similar to the problem of using our manpower and our factories. We have to decide which men will be most useful in the various branches of the armed forces, industry, and agriculture in order that our total manpower will be used most efficiently. So must we decide which soils can best bear the burden of production. We allocate our raw materials among industries producing the necessities of war and curtail the production of many civilian supplies. So must we direct the use of our soils to produce the food and raw materials most needed today.

The difficulty in directing the use of land lies in the fact that it is in the hands of millions of individual farmers, and decisions as to its best use cannot be centralized. For this reason the attitude and understanding of the farmers themselves are vitally important.

Two extreme points of view exist regarding the use of our soils. One is that we are now at war and our job is to produce regardless of its effect upon our soils; with soldiers dying by tens of thousands on the battlefronts, our war effort must not be impeded by practices to conserve our soil. People who feel this way believe that conservation is a peacetime luxury. The other point of view is that we have spent hundreds of millions of dollars to improve our soils and combat erosion, and we should not now abandon the gains of the past ten years by increasing our acreages of corn, soybeans, and other erosive crops. Both these points of view are misleading because they fail to recognize differences among soils. The first attitude may lead to a waste of resources because many conservation practices will increase production immediately. The second point of view may also result in too small a production of our needed food and raw materials because it fails to recognize the need for all-out war production.

Much of the confusion lies in the association of "conserva-

tion" with the reduction of acreages of the so-called "soil-depleting" crops such as cotton, corn, and wheat. In the AAA program these reductions were not directly related to soil erosion but to the acreage of such crops previously grown on the farm. *As a result "depleting" crops were curtailed on much nonerodible land.* At the same time a growing recognition of the seriousness of erosion made any so-called conservation practices "good" and any so-called exploitation practices "bad." No one will deny that we needed a change in our attitudes toward land use, but when reduced acreages of intertilled crops on level land become associated with conservation as always being good, a serious and dangerous handicap to war production is created. Because these ideas confuse the issues of land use and soil conservation, we must start with a brief definition of words which are commonly used but which have different meanings to different people.

WAYS OF USING OUR SOILS

Soil may be used in three distinct ways in agriculture, and the words conservation, exploitation, and improvement describe what happens to our soils as we use them differently.

Conservation means using our soils in such a way that the productivity of the soil is maintained from year to year. It is similar to the business man's idea of maintaining his factory and capital equipment by replacing one piece of machinery by a new one just as fast as the old one wears out. Conservation farming simply means we do not allow our land capital to be used up or destroyed in the process of production.

Improvement of soil means building up its productivity through the use of lime and fertilizers, the use of rotations including more legumes, or by drainage and irrigation projects. Just as the business man invests in more efficient machinery, so can the farmer invest in improving his land.

Exploitation of soil means using it in such a way that its productivity is reduced. This cannot be continued perma-

nently any more than a manufacturer can use his plant and machines without repairs or replacements for any long period of time. During a war, however, we are forced to curtail our expenditures on new machinery or on the upkeep of buildings and plant except where they are vital for war production. In many industries we are forced to use our accumulated capital of the past and expect to replace it after the war.[1] This policy can also be applied to our soils, but we have to make a distinction between capital goods (plant and equipment) and land, if we are to avoid serious problems in the future. In the case of capital goods, they can all be replaced after the war is over, and they will probably be replaced by more productive machines and buildings. This is not true of all land. Where land is subject to erosion and the soil is destroyed, its productivity cannot be restored after the war.[2] Where land is not subject to erosion, however, we can draw upon the fertility reserves during an emergency and then replace the fertility later.

The distinction between using up fertility and permitting erosion is of fundamental importance in determining production and conservation policies that should be followed during the war. Practices which would achieve the greatest production on lands where only fertility depletion occurs might reduce production and cause erosion if they were applied to other areas. Production policies must also consider the availability of labor and equipment if all our resources are to be used most efficiently. Land use, therefore, must be considered in relation to these other factors; it cannot be separated from them.

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[1] These definitions were adopted by the Iowa State Committee on Agricultural Programs. See *A Unified Agricultural Program for Iowa to Meet the Impacts of War and Peace*, C.P. 178, Iowa State College, Ames, May 20, 1941, pp. 43–58.

[2] This relationship is primarily economic in nature and depends upon the cost of restoring the productivity of the soil. For a more detailed discussion, see Arthur C. Bunce, *The Economics of Soil Conservation*, Iowa State College Press, Ames, 1942, pp. 13 and 89.

MAKING THE MOST OF OUR LAND, LABOR, AND CAPITAL

Farms vary in size, in the quality of soil, and in the amount of labor available. They also vary in buildings and machinery and in the particular abilities of the farmer. Each farm, therefore, must have its own production plan which will make the most efficient combination of all these factors. For this reason, policies which aim at increasing production must be flexible so that each manager uses his skill in organizing his particular combination of resources. Although a system of forward prices (related to the kinds and quantities of products needed) is probably the first basic requirement for directing and increasing production,[3] other programs must be developed to meet specific problems encountered by farmers and to speed up the adoption of changes in production. A previous pamphlet in this series has dealt with the type of program needed to make the best use of our labor force,[4] and before turning to the specific problems of using our land resources fully, we must see how these are related to labor and machinery.

Labor Efficiency and Land Quality

An analysis of 30 counties in Iowa showed that labor in the eroded areas of the state was producing less crop and livestock products per man hour than it was producing in the level areas not subject to erosion. For nine counties with little or no erosion hazard, the total man hours available were 24 per cent more than the estimated total labor required for all products according to an established standard of efficiency. For 11 counties with serious erosion hazards there was 50 per cent more labor available than was required. Ten counties with only moderate erosion were between these two

[3] See *Farm Prices for Food Production*, by T. W. Schultz, Pamphlet No. 2 in this series.

[4] See *Manpower in Agriculture*, by Rainer Schickele, Pamphlet No. 3 in this series.

extremes with 42 per cent more labor available than was estimated as required.[5]

These figures indicate that the output per man is 18 per cent less in the hilly areas most subject to erosion than in the level areas. This is due to two major factors: (1) The better areas have more tractors and machinery for crop production with high yields, and with abundant feed livestock production is high; (2) The poorer areas have a smaller feed production, and sufficient feed is not brought in to offset the lower crop production, so that there is less livestock raised per worker.

Other studies also indicate that on farms with smaller output per worker, there is a greater possibility of expanding livestock production beyond the 1942 level than on the more highly commercialized and efficient farms. If the differences in the output per worker largely result from tractor operated machinery and crop yields rather than differences in the efficiency of livestock production, it follows that an extra hour of labor will produce more feed if it is used on the most productive lands when these are not fully utilized.

The Corn Belt

In the Corn Belt this would mean increasing intertilled crops to the limit set by the soil resources on all the level land. On rolling and rough lands, on the other hand, greater relative efficiency will occur if the labor is used to produce increased livestock products. Historically, livestock production has been closely related to feed production on most farms with the exception of specialized beef feeding and poultry raising. The most efficient use of labor, land, and machinery during the war calls for greater specialization and the moving of feed from the areas of most productive land but scarce

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[5]Calculated from the 1940 census data. Labor available is the sum of farmers, farm managers, farm laborers (wage workers), farm foremen, and farm laborers (unpaid family workers). Labor requirements were the sum of the man hours per acre for all crops produced plus the man hours per head for all livestock. The same labor requirements were used for all counties.

labor to the areas of more abundant labor associated with a smaller feed production.

The Cotton Belt

In the Cotton Belt, a change from the production of cotton to other more productive crops and livestock products is urgently needed. To continue the production of short-staple cotton in excess of our requirements is equivalent to producing passenger cars when we need tanks. Because cotton is one of the most exploitive crops, substituting other crops will mean more conservation rather than less. The major difficulties lie in training the labor to produce other crops and livestock products and in developing farm units of sufficient size to maintain or increase income. This movement to a more diversified agriculture in the South not only means greater conservation in that region, but the production of more feed in that area relieves the pressure upon the land in other areas. The migration of labor from agriculture to war industries will make more land available to those remaining; both labor and land can be used more efficiently for the production of war supplies.

The Wheat Belt

In the Wheat Belt, erosion control has short-run and long-run aspects. Short-run adjustments involve contour strip farming with fallow and crops alternating; this should be applied extensively over those areas subject to wind and water erosion. Long-run adjustments involve strip cropping together with a five- to ten-year pasture rotation and an increase in roughage-consuming livestock; this program means that the farm size has to be greatly increased in some areas, and to the extent that families move from farms to war industries, the speed of this adjustment will be increased.

Increasing the acreage of crops on the arable land will not cause more erosion because the most serious erosion occurs on the fallow lands. An increase in crops, therefore, associated

with strip cropping will tend to reduce erosion. It will not overcome climatic hazards of drought and crop failure; those can best be counteracted through reserves of feed and livestock associated with the long-run program. Restricting the acreage of wheat, in those areas where wheat produces more feed than other crops, means a smaller production of feed; such controls have no relationship to the problem of erosion. If the land is left fallow, erosion may be increased rather than diminished.

Prices and Production

Apart from direct acreage controls, price controls may also operate to reduce the production of required commodities. This occurs when prices are maintained at such levels that a less desirable crop, or one producing less feed per acre, will yield the highest income per acre. For example, high wheat prices relative to barley mean that wheat will be grown in preference to barley in some areas although barley may yield more feed per acre; similarly, high cotton prices relative to peanuts encourage the production of cotton although peanuts might yield much more oil and feed than the cotton seed.

In general, any set of prices or production programs that in some areas curtail the output of urgently needed feed supplies or maintain the production of less essential products, increases the necessity of exploiting the soils in other areas. This exploitation, important as it is, however, is not as serious as the fact that such policies restrict our total physical output of needed war supplies and may seriously handicap the prosecution of the war.

These general relationships are presented here only to show their bearing upon land use, and to emphasize that conservation and land use problems cannot be separated from price and production policies affecting agriculture as a whole. With this background, however, we can now turn to the specific steps necessary to mobilize our land resources.

USING OUR LEVEL LANDS FOR FULL PRODUCTION DURING WAR

Production Goals for 1943

The 1943 production goals call for large increases over 1942 in hogs and chickens, a slight increase in beef and veal, and a slight decrease in mutton and lamb. The increase in livestock goals is reflected in an increase in the acreage of corn from 91 million in 1942 to about 100 million for 1943. Barley also has been increased, together with potatoes, peanuts, and flaxseed. The acreage of oats has been reduced. It is essential that the real nature of production goals be recognized. They do not represent *the maximum quantities* we can or should produce. Only in the case of a few crops, such as those that are now being produced in excess of war requirements, are there limits beyond which it would be unwise to go. In feed crops in general our aim should be to produce the maximum quantity possible in 1943. The need for action has been recognized by the Department of Agriculture; penalties for excess planting of corn over acreage allotments have been abolished and restrictions over the acreage of spring wheat have now been removed. These are important steps in the right direction and will result in an expansion of both our corn and wheat acres.

Land Use Policies During the War

In broad terms our war policy should be to use our level land, labor, and capital resources to expand the production of grain feeds to the limit if necessary at the expense of roughage feeds. In order to achieve these results, it is essential that erosive crops (largely those that are intertilled, such as corn and soybeans) be expanded on those soils not subject to serious erosion and replace other crops which yield fewer feed units per acre (such as oats) or produce crops (such as cotton) less essential to the war program. This will involve expending some of the reserves of fertility that exist and which can be built up after the present emergency is over.

By using forward prices, production of the desired crops can be stimulated, and farmers over the emergency period will be able to increase their incomes by shortening their rotation to include more corn or soybeans. Yields should be maintained as far as possible by the use of fertilizers. As long as the more exploitive system does not reduce yields so as to lower the total output of feed and other required commodities, this system will yield the greatest output and give farmers the greatest possible income.

In this country we have, fortunately, a large area of land that can be used in this manner without serious damage to the soil. These areas are located in the Corn Belt extending from the eastern sections of the Dakotas and Nebraska and sweeping eastward across the southern part of Minnesota, the northern half of Iowa, Illinois, Indiana, and into Ohio. The area is characterized by fertile soils, rainfall ranging from 20 to 40 inches, and a growing season from 120 to 180 days. It is not uniformly level, but slopes are gentle except where the terrain is broken by rivers. The greater part of the area is not subject to such severe erosion that its intensive use for intertilled crops for a few years will permanently impair its productivity.

Present AAA Policies Must Be Changed

In order to obtain the maximum use of these level soils, present AAA policies must be changed. While it is true that penalties for excess plantings of corn have been abolished, some control over corn acreage is maintained by including oats (as a nurse crop), hay and pasture land in the list of war crops for which AAA payments may be made. Failure to meet the quotas established for these crops means penalties in respect to AAA payments. Because acreages of various crops are based upon historical[6] production, and because

[6] The acreage allotments of the AAA program were based upon the past production of specific crops, and acreage adjustments were made in terms of percentage reductions of this historical base.

increases in intertilled crops usually have to come at the expense of acreages in oats, legumes, and pasture, the program still operates to prevent the maximum use of level soils in the production of intertilled crops. It is essential, therefore, that (1) all acreage control over intertilled crops be abolished, and (2) that no payments be made or quotas be established for oats, seeded or unseeded, hay crops, or permanent pasture.

Where, in addition to prices, quotas and incentive payments are necessary to encourage the production of special war crops (such as soybeans or peanuts) that are not used locally for feed, preference should be given to surplus grain areas over areas where there is a shortage of feed. Other factors, such as the location of processing plants, yields, and experience, must also be considered, but where such quotas (as are being made for soybeans, for example) are allocated on a purely historical base, it may mean that we are adding an unnecessary burden to our transportation system. Where deficit grain areas receive quotas for crops that cannot be fed locally, *the quantity of feed crops is reduced*; more feed has to be shipped in, and in addition the other crop has to be shipped out.

In 1942 Iowa produced about 12 million acres of intertilled crops. These can be expanded to 14 or 15 million acres[7] without seriously increasing erosion, provided that the increases occur on the level lands and simple conservation practices such as contour cultivation are adopted on the rolling lands. Apart from the AAA program, there are other factors which tend to prevent this expansion: (1) Most farmers have some livestock requiring pasture and hay. (2) Many farmers have a heavy hog feeding program and in some cases are raising as many as 75 to 100 head per man, so that livestock feeding competes with corn production for labor. To offset these factors farmers should be encouraged to reduce their

[7] For an analysis of where such increases should occur, see *Upper Limits of Intertilled Crop Acreages by Counties in Iowa*, by A. J. Englehorn and A. C. Bunce, Mimeo., June, 1942, Iowa State College, Economics Department.

roughage-consuming livestock (particularly horses and cattle) rather than expand them. Where expanded hog production would curtail the labor available for the production of feed grains, seasonal workers should be made available to meet the peak requirements, or farmers should be discouraged from expanding their hogs any further so that they can handle a maximum acreage of feed crops with their present labor force.

Save Now for Soil Improvement Later

This increase in intertilled crops cannot, in most cases, be maintained indefinitely because the fertility of the land would gradually be reduced. The exploitive nature of this procedure, and the fact that it cannot be permanently maintained, must be recognized, and *part of the resulting high income should be saved for the period when income is reduced and fertility is restored by including more legumes in the rotation.* In other words, part of the current income represents disinvestment or liquidation of capital assets, and this should be placed in a fund for reinvestment after the war. If this is done, much of the danger of inflated land values due to abnormally high present incomes would be removed and a cushion provided to offset the lower incomes which must inevitably result during the rebuilding period. To encourage this saving, part of the increased current income should be classed as depreciation and deducted from net income in calculating income tax. At the same time widespread publicity should be given to the temporary nature of the income resulting from this expenditure of soil fertility.

For example, a farmer who has 200 acres of crop land and usually plants 100 acres of it in corn might grow 150 acres of corn each year for a five-year period. The larger acreage of corn would tend to reduce the fertility of the soil, and yields would gradually fall so that at the end of the five-year period he might have to cut his corn acreage to 75 acres for four years in order to build up the fertility again. During the five-year period he would probably have to work longer hours, reduce

his roughage-consuming livestock and raise more hogs or sell the grain for cash. He would, however, increase his average annual income $500 a year.[8] Half of this saved over the five-year period would amount to $1,250 and provide about $300 a year for the four years when the corn acreage was cut in order to rebuild the fertility. The other half of the increased income would represent increased labor returns. At the same time income from the liquidation of roughage-consuming livestock should be held over for reinvestment when roughage crops have to be expanded.

Conclusions

In the level areas suitable to corn production, increased acreages of intertilled crops should have priority claims on the farmer's resources over livestock. We will see in the following section that in the rolling areas the priorities are reversed. This is necessary because the areas not subject to erosion are much more limited than are the areas in which livestock production can be increased. Also, to the extent that increased production of erosive crops can be attained in the level areas, an expansion of these crops in the areas subject to erosion can be avoided.

USING OUR ERODIBLE SOILS FOR FULL PRODUCTION DURING WAR

The Alternatives Available

The level fertile plains of the Corn Belt shade into the Wheat Belt in the West, the dairy area in the North, and generally less highly commercialized farming in the South and East. Except to the West, where moisture becomes the limiting factor, the topography changes to rolling and steeply sloping land with poorer soils subject to severe erosion when

[8]An average increase of 2,500 bushels of corn at 80 cents would yield an additional gross income of $2,000 a year, while hay yielding 3 tons per acre valued as high as $10 a ton would yield only $1,500.

planted in intertilled crops without special conservation practices. Except in the specialized milk-producing areas, it is on the less commercialized farms that there is the greatest possibility of using the family labor more fully. In the broad belt of lands extending east and west below the Corn Belt and extending southwards to the cotton areas we have more labor available, less tractor and specialized row crop machinery, and more erodible soils than in the level area.

Many farms can make a great contribution to total production by doing one of the following: (1) using the land to produce more intertilled crops by expanding their acreage or adopting conservation practices that increase yields; (2) keeping feed production at its present level, purchasing more concentrate feeds, and feeding more livestock; (3) improving the yields of hay and pasture and raising larger numbers of roughage-consuming livestock. In some areas improved roughage production may be a more effective method of increasing feed production than an expansion of the acreage in intertilled crops. A study in southern Iowa and northern Missouri where erosion is a serious problem showed that farmers following a conservation system produced more hay and pasture as well as more total feed than did others; also, their livestock production was greater. They also fed more roughage-consuming and total animal units than did the others. Thus, in spite of a smaller production of feed grains, more total feed was raised and more livestock fed.[9] The maximum production would call for a combination of all these three alternatives among farmers as a whole.

The Danger of Increased Erosion

On erodible soils, however, we cannot achieve the best balance of farm production by the simple policy of removing

[9] For detailed figures, see the author's article, "War and Soil Conservation," *Journal of Land and Public Utility Economics*, Vol. XVIII, No. 2, May, 1942, pp. 132 and 133.

all acreage controls and incentive payments, and directing production through forward prices. Such a program would lead to: (1) an over-expansion of erosive crops; (2) serious soil erosion because of poor soil management; (3) under-expansion of livestock feeding in these areas; and (4) under-expansion of roughage crops and the related livestock.

1. Over-expansion of erosive crops would occur because many farmers make no allowance for the depreciation of their soil that may result from increasing intertilled crops; they ignore the fact that higher temporary production and income now may mean permanently lower production and income in the future. Moreover, expanding the acreage of erosive crops requires very little extra expense and involves no additional risks. As we learned, to our regret, during the first World War, it is easy to expand production this way. Hay and pasture lands were plowed up for corn, and serious erosion developed. In many cases, liming and seeding to legumes would have yielded more feed and permanently increased production.

2. Serious soil erosion may follow the removal of restrictions on intertilled crops grown on sloping lands because the necessary conservation and soil management practices may not be adopted when the acreage of these crops is expanded. Contour farming and strip cropping involve changes in the customary methods of cultivation; these practices may also involve cash expenses for moving fences so that fields conform to the contour of the land. Without some controls or incentive programs, these practices, which are also needed on much of the land at present in intertilled crops, are not likely to be adopted on the scale necessary to combat erosion in these areas. Thus an expansion of intertilled crops may be followed by a rapid and permanent decline in productivity.

3. The expansion of livestock feeding in areas subject to erosion may be held in check by one or more of several conditions. Credit may not be available on satisfactory terms,

and extra credit may be essential. For increased livestock production, funds may be needed to purchase more stock or to enable the farmer to hold existing stock for breeding rather than to sell it. Housing facilities may require additional expenditures, and additional feed may have to be purchased. Uncertainty as to feed supplies increases the element of risk even if the major uncertainty due to price changes is removed by a forward pricing system. Insecurity of tenure also acts as a barrier to an expansion of the livestock enterprise. In the fall, when crop share rents fall due, the farmer may deliver half the corn to the landlord because he lacks the cash to buy it for later feeding on the farm. Even though their credit is good, many farmers do not like to borrow the funds necessary to expand livestock feeding because it has been looked upon, in the past, as a highly speculative venture. All these factors operate to retard the expansion of livestock feeding and need to be offset by special programs to decrease risks and make credit and feed supplies available on satisfactory terms.

4. A desirable expansion of roughage production may fail to occur because this involves the production of higher yielding legumes through reseeding, liming, and fertilizing of hay and pasture lands. This involves cash outlays for the necessary materials and must be associated with an expansion of roughage-consuming livestock. As was indicated above, this also calls for an increase in investment and may involve additional risks that the farmer is unwilling to assume.

Conclusions

The above conditions indicate that simply withdrawing government controls over acreages of intertilled crops in areas subject to erosion may result in an increase of such crops, a decline in roughage production, and little or no increase in livestock production. This increase in intertilled crops is undesirable in those cases where labor could be more efficiently utilized in livestock production and where improved

hay and pasture production would yield more feed; it may also cause a permanent impairment of productive resources and create serious post-war problems which cannot be solved by the simple process of reinvestment.

More specific measures for directing land use are needed in the areas subject to erosion, and the measures must be related to the quality of the soil resources. This means that we must establish a simple guide to land use if war production is to be maximized and a waste of resources avoided.

PLANNING LAND USE ON THE INDIVIDUAL FARM

The Problem of Planning

So far we have discussed the relationship of conservation to maximizing production in terms of broad areas of erodible and nonerodible soils. While such areas do exist it is more common to find these two types of land on the same farm. If the farmer is to maximize his production from nonerodible lands by growing all the intertilled crops he can, no farm quotas for erosive or "soil-depleting" crops can be established on a historical base. For soils subject to erosion various alternatives may be available, and the acreage of intertilled crops should be related both to erodibility and the conservation practices employed. Whether a farmer uses all possible conservation practices and grows a large acreage of intertilled crops or uses a long rotation with large acreages of grass will depend upon the size of the farm, the equipment, the livestock system, and the farmer's preference and ability. *All these factors, together with the quality of the land, must be considered if the most efficient use of all resources is to be attained.*

In planning to use his land to maximize production, therefore, the farmer must consider the erodibility of the soil, livestock production, farm size, family labor, machinery, and buildings. To facilitate such planning, and avoid unnecessary increases in erosion, it is desirable that the farmer use a simple land guide to determine the acreage of intertilled crops.

A Simple Land Classification

Any simple classification of land for the purpose of indicating the erodibility of the soil must be based upon factors easily observed by farmers without detailed technical assistance. It will of necessity be less accurate than one based on all the factors affecting erosion. The erodibility of soils under a given cropping system, and in an area of similar climatic conditions, depends upon soil type, degree of past erosion, and steepness and length of slope. The most important single factor from the point of view of erosion, however, is the steepness of the slope.[10] Using this factor as a basis of classification, four classes might be defined with the class divisions depending upon the area involved, for example:

Class 1. Lands subject to slight or no erosion. Nearly level land (under 3 per cent slope).

Class 2. Lands subject to moderate erosion. Slightly sloping land (3 to 8 per cent slope).

Class 3. Lands subject to severe erosion. Rolling land (8 to 12 per cent slope).

Class 4. Lands not suitable for cultivation because of extreme erosion or other factors. Strongly sloping land (over 12 per cent slope).

For each class simple standards of land use can be established to act as a guide for the farmer and other planning agencies designed to cooperate with him in developing his production plans. Standards for these classes are easy to define. Class 1 land should be used as intensively as possible for the production of intertilled crops, while class 4 land should be kept in permanent pasture or hay. For classes 2 and 3, upper limits for intertilled crops, related to the erosion control practices used, need to be established for each county or major soil area; class 2 land might have 25 per cent in intertilled crops if no conservation practices were used, 33 per cent

[10] For a statistical analysis of the importance of this factor, see "War and Soil Conservation," *Ibid.*, pp. 126–29.

if planted on the contour, and 50 per cent if strip cropping and terraces were used. Class 3 land might have 20 per cent in intertilled crops if no conservation practices were used, 25 per cent if contoured, and 33 per cent if strip cropped and terraced. These standards should become guides for individual farm planning so that the intertilled crop acreages would be directly related to the erodibility of the soil and the conservation practices used.

Applying the Standards

The use of such a simple classification and standard of land use corresponds to the general rule of thumb planning by farmers; it provides an objective measure against which farmers' plans can be checked and modifications suggested. The AAA already has each field measured and it would be a simple matter to add a class number to these acreages. Where a field contained several classes of land, a temporary classification based upon the percentage of each class present could be made. Where more detailed maps have been prepared, as in the case of many soil conservation districts, these could be used instead of the simpler classification suggested here. In all cases the standards should be used as guides indicating the upper limits of intertilled crops, the relationship of conservation practices to land use, and the areas in which expansion should be directed in order to least damage our soil resources. They do not determine what is the most desirable land use because this will depend upon the total resources available to the farmer.

ESSENTIALS OF A UNIFIED PRODUCTION AND CONSERVATION PROGRAM

Forward Prices Are Not Enough

If flexible production plans that will combine land, labor, and capital resources most efficiently are to be developed on individual farms, limits on acreages of feed crops should be

removed and production of the required quantities of crop and livestock products directed by prices guaranteed over the production period.[11] The use of forward prices alone, however, will not achieve the most efficient use of resources in all cases. Price incentives are powerful forces, but they do not overcome many of the social forces that oppose change.

Lowering the price of cotton relative to feed and livestock prices would not rapidly reduce the acreage of cotton and increase the quantity of feed crops unless the price change were extremely large. The farm size pattern, the land tenure system, the experience and ability of labor are all related to cotton production, and these cannot be changed rapidly. In addition to price adjustment, therefore, it may be necessary to reduce the acreage of cotton by making smaller acreage allotments. If this is done, the allotments should not be made on an historical base but on the basis of the soil resources and the comparative productivity of alternative crops. Only the nonerodible cotton lands where cotton is the most productive crop should continue to produce cotton, while the relatively less efficient and more erodible lands should be used to produce livestock and the less erosive food and feed crops required for war purposes. To stimulate this shift in production special subsidies for needed crops, education, and measures giving security of tenure are all needed to get the job done rapidly. To the extent that small farm units can be consolidated, this program will be made easier, and the moving of surplus labor to areas of labor shortage complements this general movement to a more diversified southern agriculture.

As was indicated earlier, there are also many resistances to the expansion of livestock in the areas subject to erosion surrounding the Corn Belt, and additional measures are needed in order to obtain the best use of both labor and land resources. All these various needs can be brought together in a series of

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[11] See T. W. Schultz, *Redirecting Farm Policy*, Macmillan Co., N. Y., 1943

programs designed to increase production and reduce the wasteful destruction of resources through increased erosion. These may be summarized as follows:

1. The Use of Allotments

Quotas or allotments for specific crops should be made when prices will not effectively induce the desired shift from one crop to another. In making such allotments two basic principles should be followed.

a. All erosive crops should be allocated in relation to the erodibility of the soil and the conservation practices employed and not on a historical base.
b. All nonfeed crops should be allocated to counties producing a surplus of feed in preference to counties which have to ship in feed. When other factors such as labor, yields, and processing facilities are the most significant in determining the areas of production, this generalization does not hold. However, it is particularly important in the case of soybeans in the Corn Belt where allotments on a historical base have meant that feed-deficit counties have planted soybeans instead of corn; where they have not been used for feed this has increased the need to ship in more feed. The present AAA program actually discourages farmers from growing feed in feed-deficit areas and encourages them to produce soybeans to be shipped out for processing.

2. The Use of Subsidies

In order to stimulate better use of our more erodible lands, special subsidies for the following practices should be continued.

a. Seeding of highly productive nonerosive crops, such as legume hay and the renovation of poor pastures. This could include the cost of lime, fertilizer, and seed.
b. Contour planting and strip cropping on sloping lands in

order to increase the acreages of erosive crops, maintain or increase yields, and reduce erosion. Payments might also cover terracing where it is desirable, but because of labor and machinery shortages, the expansion of terracing should be confined to areas where it is most essential to increase production and where serious erosion would occur without it. Where contouring necessitates moving fences, special payments may be desirable.

Such subsidies should be made only for nonerosive crops and conservation practices, and should be limited to lands subject to erosion. The present AAA program includes oats (seeded with legumes), hay, and pasture as war crops; and the allocation of quotas of these crops to level areas means, in many cases, that we curtail our maximum output of feed and do nothing to reduce erosion. Where high-yielding roughage crops yield higher returns on level lands, they will be continued, and no incentive payments are necessary. Where they do not yield higher returns they should be replaced by more productive crops.

3. Encouraging Livestock Production

In order to expand our livestock production in the areas where labor is available, and indirectly offset any tendency to use this labor to expand intertilled crops on erodible lands, it is essential that feed be made available on simple credit terms. Many farmers do not like to borrow money and purchase feed when there is uncertainty as to future prices. Even though favorable prices were assured, the reluctance of farmers to go into debt may seriously retard livestock expansion. A simple arrangement would be to have the AAA sign up farmers in the erodible areas to raise a specified number of hogs and purchase the necessary quantity of feed. The AAA could then purchase the feed from the nearest grain surplus area and deliver it to a central point. The contract might also stipulate that the hogs were to be maintained on clean

ground, vaccinated, and fed an adequate quantity of protein supplement. Specific farrowing and marketing dates might also be agreed upon in order to spread the marketing over longer periods so that packing facilities might be more efficiently utilized. Profitability to the farmers could be assured either by guaranteed prices of corn and hogs or by a guaranteed return per hundred pounds of live hogs produced. The feed loans would be repayable at the time the livestock was marketed. The same plan could be used to purchase the landlord's share of feed crops so that the tenant could feed them on the farm. Where livestock facilities were inadequate, small loans for equipment and breeding stock might also be necessary, and these could be handled through federal credit agencies including the Farm Security Administration.

Because insecurity of tenure is a serious handicap to expanding livestock production and the improvement of hay and pasture lands, methods of giving greater security of occupancy and investment should be devised. Techniques that have proved useful are (1) longer notice of the cancellation of the lease or longer lease periods; (2) compensation for unexhausted improvements, such as legume seedings, liming, etc.; (3) permission for the tenant to move small fixtures, such as poultry and hog houses, or agreement by the landlord to purchase them at specified prices; and (4) arbitration of disputes in order to solve conflicts that may arise.

4. Appeals to Patriotism

Patriotic appeals to farmers to cooperate in the war effort are an increasingly important method of furthering better wartime farming and management of wartime incomes.

In 1942 farm income reached an all-time high. At the same time there were less consumers' goods such as refrigerators, plumbing fixtures, electric equipment, machinery, etc., for the farmer to buy. The incentive to produce more in order to raise the level of living or buy capital goods is weakened.

Increased income, therefore, may lead farmers to reduce their indebtedness or to increase it by buying more land. To the extent that the latter occurs, the danger of inflated land values is increased, and the stability of agriculture threatened. To offset these tendencies farmers must be urged to increase production, not only to obtain more income, but to contribute to the more rapid conclusion of the war and maintain food rations at as high a level as possible. At the same time farmers must recognize that part of the increased income is due to a dis-investment of soil resources and should be placed in a sinking fund to cover the reinvestment period that will inevitably follow. This might well be achieved by the purchase of government bonds, by debt retirement, and by paying up insurance policies.

The Soil Conservation Service

To achieve the objective of a unified production and conservation program as outlined above, the functions of present federal administrative units would be somewhat changed. The Soil Conservation Service has a trained technical staff specialized in developing land use plans in relationship to erosion hazards. It is logical, therefore, that they, together with the State Experiment Stations, be given the immediate task of establishing county standards of desirable land use on a simple basis that can be applied immediately on all farms. These two organizations should also be largely responsible for determining the specific rates of payment for the adoption of conservation practices and the improvement of hay and pasture production. Essentially, we need a complete production and conservation program for each farm similar to those developed by the Soil Conservation Service on demonstration projects and in conservation districts. We have neither the time nor the personnel to do this completely, but methods of moving in this general direction on a broad scale must be developed.

The Agricultural Adjustment Administration

The Agricultural Adjustment Administration would have the task of assisting each farmer to develop a farm plan in harmony with the standards and criteria developed. It would obtain the production intentions of farmers and tabulate them in order to provide the necessary check of production against the national goals. With decentralized production plans, there must be methods of checking production against the goals established at the federal level. In the past total national production goals have been broken down and allotments made to states; state goals were distributed to counties and then to individual farms. The weakness of this method lies in the reliance that has to be placed upon historical production as a basis for determining farm production quotas. Increases in intertilled crops allocated on such a basis have no relationship to the physical resource pattern and may waste resources rather than conserve them. In order to develop flexible individual farm plans, each farmer must maximize production and income according to his labor supply, his equipment, and the quality of his soil resources. *Under these circumstances no individual farm goals can be derived from the national goals established.* The production of the desired types and quantities of crops and livestock must, therefore, be directed by a system of guaranteed prices adjusted from year to year as goals and production responses vary.

Under these circumstances, there is no direct relationship between the national production goals and individual farm plans; in order to check the effectiveness of the prices used to direct production, it is essential that production intentions be tabulated rapidly by counties, states, and for the nation as a whole. At the various levels these can be compared with previous production attainments.

Cooperating with farmers in the formulation of individual farm plans would be the major function of the AAA; it would

also be responsible for checking compliance by farmers in producing the acreages of crops for which allotments were considered desirable and for the attainment of conservation practices and crops for which subsidies were allotted in the general farm plan. The AAA could also sign up farmers for specific livestock increases and make feed available in the feed deficit areas.

Cooperative Actions

The Extension Service will face an additional task in training AAA committeemen to become efficient in assisting farmers to develop production plans; the staff of the Soil Conservation Service should be made available to cooperate in this educational program in areas where erosion is serious.

Whether we look at the problem of war production from the point of view of manpower, or conservation, or of maximizing production, we are forced to realize the interdependence of all these elements and the necessity of a unified program. In many ways such a program will simplify our problems because all elements will supplement each other and can be focussed in the local communities through the county war boards. We need only a brief glance at the present food shortages to realize that the need for action is urgent if we are to meet the needs of both the war and peace.

WAR PRODUCTION POLICIES AND POST-WAR ADJUSTMENTS

Preparing for Future Adjustments

One of the greatest advantages of developing individual farm plans is that the three basic factors of soil, operator, and prices are brought together, and these form a logical basis for any adjustments that may be needed after the emergency is ended. What these adjustments will be depends upon the post-war organization of Europe, particularly with respect to tariffs and international agricultural poli ies.

If interdependence, exchange of goods, and an expanding world market develop, we may again be exporters of grains, cotton, and lard. Part of the European grain area may turn to the production of dairy products, fresh meats, and fruits, and livestock production generally may expand. If economic nationalism again dominates the peoples of the world, we may face the necessity of curtailing our production of some products. Adjustments both in Europe and in this country are inevitable, and the unified program outlined above will give us a better basis for making more satisfactory adjustments because any necessary crop controls can be related to the physical resources involved.

Eliminating Conflicts

The policies suggested in this pamphlet would eliminate the conflict between conservation and production control that existed in the past AAA program. Any expansion of depleting crops on a percentage or historical basis is unsound from a conservation point of view because it is not related to the physical resources, and any percentage reduction of specific crops as a means of adjusting production fails to take into account the relative importance of that crop to the balance of the farm as a whole and its relationship to commercial production. Because it is necessary to harmonize production adjustments and conservation during the emergency, we can lay the foundations for a sounder adjustment program in the future. The production adjustment program of the future might include acreage payments for the production of new commercial crops, the ever-normal granary, and price guarantees over one crop year supported by loans. Conservation payments could then continue to be made for positive conservation action or, as may become desirable, for actual land improvements such as terracing, drainage, and irrigation.

The program outlined in this bulletin neither discards conservation as a peacetime luxury nor does it make it the

first aim of agricultural policy. The first objective is to increase production, the second is to do it in such a way that useless increases in erosion are avoided. If out of the urgency of the present need we develop programs and results that will be beneficial to our agriculture in the more distant future, that is all to the good. It does not mean sacrificing the present but only selecting the best means now with some knowledge of their implications to the future.

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