FACTORS AFFECTING THE ECONOMICS OF SOIL CONSERVATION

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Economic returns from conservation farming are influenced by many factors. Some are associated with the direct application of recommended practices. Others are associated with changes that occur in farm organization as a result of adopting conservation rotations. The purpose of this discussion is to consider how costs and returns from conservation practices depend upon (1) different levels of conservation, (2) soil type, (3) crop disposition, (4) price relationships, and (5) period of time considered.

COMPARISON OF DIFFERENT LEVELS OF CONSERVATION

Returns from soil conservation practices depend upon the comparative levels because many degrees of intensity exist in actual practice. Different levels are possible in many areas because of the number of practices recommended. For example, some farmers follow a good rotation, but fail to adopt the mechanical practices recommended for their farms. Other farmers apply an adequate amount of lime and fertilizer on the cropland, but continue to follow a soil depleting rotation. In other cases, farmers lime and fertilize the cropland, but the amounts applied are lower than recommended applications.

Since most farmers follow some soil conservation recommendations, farms cannot be divided into conservation and non-conservation groups for purposes of analysis. A certain amount of soil conservation is accomplished whenever a farmer applies lime or fertilizer, or raises a meadow crop. However, many farmers may not be following adequate soil conservation practices to maintain their farms as producing units. Greatest returns from conservation farming should occur when comparisons are made between low and high levels. Smaller returns might result when comparisons are made between medium and high levels. Costs and benefits might still be different when comparisons are made between low and medium levels.

In calculating potential returns from adopting conservation practices, comparisons must be made with some ideal program. Potential returns for a specific farm will depend upon the objectives to be accomplished. For example, conservation farming might be based purely upon physical objectives. In this case, the goal might be to increase the productivity of the soil and maintain it near the original level. In rough areas, this objective may require using the land only for permanent pasture or woods. In level areas, rotations with a high percentage of meadow crops may be necessary to more nearly meet this goal. Other conservation objectives might be based upon economic considerations. In this case, the goal would be to apply conservation measures as long as the additional costs did not exceed the additional returns. Costs and returns from soil conservation practices might be calculated from the standpoint of the individual farmer or society. In some cases, these calculations may not coincide inasmuch as different periods of time are considered. Many farmers are interested only in economic benefits for the period they plan to operate the farm, but society must be concerned for a much longer period of time. Different conservation objectives will require different expenditures of labor and capital for establishment and maintenance. Returns also will vary according to the amount of conservation practices applied. Therefore, the economics of conservation farming will depend upon the goals to be achieved and the levels compared.

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SOIL TYPE

Economic benefits from adopting needed conservation practices will vary according to soil type. Some soils may be depleted of their productivity and brought back without any permanent damage. In this case, costs of soil depletion are actually the costs of restoring the productivity to a previous level. In addition to these temporary losses, other costs must be considered when permanent damage occurs from erosion. These costs will vary according to soil type and amount of erosion that has occurred. The economics of soil conservation is affected also by the rate of soil erosion and fertility depletion. Some soils may be depleted to unprofitable levels in a shorter period of time than others.

Costs of establishing soil conservation practices will vary according to soil type and topography. These expenses are often small in level areas where recommendations include only conservation rotations supplemented by adequate amounts of lime and fertilizer. Where drainage is needed expenses are considerably higher, the amount depending upon whether complete or random tiling systems are established. In rolling areas where erosion is serious, expenditures are often made to establish mechanical as well as agronomic practices. When terraces are established, costs are increased at the time they are constructed. Field arrangement may be improved on some farms by fencing on the contour. On other farms, additional lanes and watering facilities may be needed for livestock because new fields do not connect with the barnlot. Contour cultivation may produce longer rows on some farms, but on others point and crooked rows may interfere with the use of modern farm machinery.

In areas where the land is too irregular to apply mechanical practices, conservation recommendations usually include less grain and more meadow crops in the rotation. This often results in additional expenditures for livestock and buildings to utilize more hay and pasture. The kind of hay raised is often influenced by the type of soil. On some soils legume hay is difficult to raise in second and third year meadows because alfalfa winterkills. In this case, high quality hay is not available to offset reductions in grain acreage.

DISPOSITION OF CROPS

Returns from adopting conservation rotations will depend upon the disposition of crops raised. For most soils, some meadow crops are needed in the rotation for maximum grain production. Under certain conditions, raising more meadow crops not only increases forage production, but also total grain production. This relationship exists as long as reductions in the acreage of grain are offset by sufficient increases in the yields per acre. Meadow crops increase grain yields by improving soil structure, adding nitrogen and controlling erosion. As long as total grain production increases when more meadows are raised, additional forage presents no problem. In this case hay can be turned under and income will still be higher than it would be if less acres of hay were raised. This is due to the fact that a reduction in the acreage of meadows would decrease the production of both grain and forage.

As more acreage of meadows is added to the rotation, a point is reached where total production of grain declines. This occurs whenever yields per acre fail to increase fast enough to offset reductions in grain acreage. When total grain production declines as a result of adding more hay crops in the rotation, net receipts also will decline unless some income is obtained from forage crops. Under certain conditions, income per acre from hay may be less than the income from grain. Hay is often more difficult to sell than grain because of variation in quality. Unfavorable weather during the harvesting season will reduce the quality of hay more than corn. In wet seasons farmers may lose a whole cutting of hay, but they seldom lose a crop of corn. In some areas, the price of hay varies considerably

more than the price of grain. On some farms more hired labor is needed to harvest hay than grain.

When forage is fed to livestock, farm income will depend upon the type and efficiency of the livestock kept, and the price of livestock and its products. In many cases the dairy farmer will find it much easier to adopt conservation rotations than the hog farmer. Dairy farmers can use large quantities of hay and pasture, but hog farmers want only enough meadow crops to maintain corn yields at a profitable level. Some farmers object to keeping dairy cows because they do not want to work seven days a week. Others object to buying feeder cattle to consume additional roughage because of the risk involved. Potenial returns from conservation rotations will vary according to the livestock and marketing programs found on various farms. Returns from rotations with more meadow crops will be low if large amounts of hay and pasture are fed to inefficient livestock. On the other hand, additional meadow crops may increase net farm income on some farms when fed to high producing animals. Returns from feeding more forage to dairy cows will be less in areas where the price of milk is low, and more in areas where the price is higher.

PRICE RELATIONSHIPS

Economic returns from recommended conservation practices depend upon price relationships. Whenever price relationships change, new calculations are necessary to determine the amount of conservation measures a farmer can afford to follow. For example, if the cost of lime, fertilizer or tiling increases in relation to other farm costs, profits will be maximized or greatest by using less of these factors of production. Likewise, if costs of these three factors decline relative to other expenses, profits will be maximized by using more of these factors and less of others. On some farms the amount of grain and meadow crops that will give maximum profits will depend upon the price relationship between hogs and milk. If the price of hogs should increase relative to milk, profits may be made greater by raising more grain and less hay provided enough meadow crops are kept in the rotation to maintain grain yields at a profitable level. If the price of milk should increase relative to that of hogs, profits might be maximized by raising more meadow crops than actually needed for conservation purposes.

Returns from conservation farming will vary according to price relationships. Prices of farm products and costs of production for specific years may vary considerably from the average over a period of time. In some cases, profits might be maximized by raising more grain when prices are high and less when prices are low. Theoretically, this procedure would be sound as long as no permanent damage was done to the soil. However, it might be more practical to follow a good conservation program each year because future prices are difficult to determine accurately.

SHORT TIME VS. LONG TIME RETURNS

The economics of soil conservation depends upon the period of time considered. Net income will increase on many farms after sufficient time has elasped to recover the costs of conservation practices and changes in farm organization. However, during the transition period net income may actually decline for several years because expenses increase more than reciepts. For example, costs of liming cropland are not recovered on many farms until a meadow crop can be produced and marketed through livestock. Similar situations exist when expenditures are made for liming and fertilizing permanent pastures.

Higher crop yields from conservation rotations cannot be expected until better meadow crops are raised and larger residues plowed under. In the meantime total grain production may decline considerably during the transition period because of reductions in grain acreage. Several years may be required before

economic gains from terracing equal cost of construction. Fencing woods against livestock and planting trees will have little effect on increasing immediate farm income. Concrete structures may greatly increase cash outlays the year they are made. Expenditures for housing additional livestock cannot be recovered as quickly when new buildings are constructed as they can when present ones need only minor changes.

Economic benefits from soil conservation practices will vary according to the rate of application. Some farmers adopt all needed conservation measures in a few years. Others use a longer period of time. The rate at which some farmers apply conservation recommendations depends upon their financial resources. At certain times farmers may not have enough available cash to educate their children, modernize the home, make payments on the farm and apply needed conservation practices. In this case, some farmers may prefer to educate their children and modernize their homes at the expense of the soil even though a smaller income results later from this procedure. To some farmers heavily in debt, losses in soil productivity are not as serious as losing the whole farm by foreclosure in the near future.

Many farmers apply conservation recommendations to the point where they think income will be maximized as long as they are interested in the farm. If they plan to retire or sell the farm soon, they often apply only those practices that will pay off in a relatively short period of time. Many tenants are not interested in making expenditures for conservation farming because they have no assurance they will remain on the farm long enough to recover their additional costs.

SUMMARY

1. Many factors influence the economics of soil conservation.
2. Costs and returns are influenced directly by such practices as liming, fertilizing, terracing and drainage.
3. Costs and benefits are influenced indirectly when changes are made in buildings and livestock to utilize more hay and pasture.
4. Inefficient livestock and poor markets for hay and milk reduce potential gains from soil conservation rotations on some farms.
5. Economic returns from soil conservation programs depend upon the period of time considered. During the transition period, net income may decline because certain expenditures are not completely recovered for several years.
6. On some farms, the benefits from conservation farming will depend upon whether the goal is based purely on physical or economic considerations.
7. Since the economics of conservation farming depends upon many factors, most farmers are interested in knowing how these factors influence the amount of conservation practices they can afford to adopt on their farms.

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