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LONG-RANGE LAND RETIREMENT AS A SOLUTION TO THE WHEAT SURPLUS PROBLEM

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Long-Range Land Retirement as a Solution to the Wheat Surplus Problem

by

Craig Jagger and Kenneth L. Robinson*

Introduction

American agriculture is once again confronted with the problem of excess capacity.[1] Surplus stocks of grain have continued to rise despite government efforts to limit supply and to encourage use. Government support costs also have risen dramatically since 1980. Annual set-aside programs have failed to eliminate the surpluses and the costs of attracting participation continue at high levels.

The 1985 farm bill contained various provisions designed to address problems of excess capacity. These included lowering support prices, introducing export subsidies, and initiating a new Conservation Reserve Program. Many observers believe that more emphasis over the next few years will have to be placed on long-range land retirement schemes to achieve the required adjustments in production at less cost. If these schemes are targeted to vulnerable land, such as with the current conservation reserve, they might also help to reduce soil erosion.

The pages which follow summarize the results of a study, completed in October, 1985 (before passage of the 1985 Farm Security Act), that assessed the economic consequences of implementing a long-range land retirement program designed to eliminate wheat surpluses [Jagger (a)]. The principal objectives of such a program would be to reduce support costs, to encourage more permanent adjustments in wheat production, and to reduce potential soil losses.

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[1] Jagger (a) provides a discussion of excess capacity concepts in the context of the U. S. wheat sector [pp. 17-40]. Robinson, 1986, discusses factors underlying current excess capacity in U. S. agriculture and alternative policy instruments for coping with it.

A feature which makes this study different from other studies of long range land retirement is that equity problems related to tenants are analyzed. A new system to partition benefits between landowners and tenants is proposed.

The paper is organized as follows: first, theoretical reasons why program costs could be reduced under a long range program are developed. Second, the elements of a proposed program are outlined. Third, the costs of retiring varying amounts of wheat land in the Great Plains region are estimated. Areas within the region where participation in the proposed program would most likely occur also are identified. Fourth, the profitability of participating in a long-range land retirement scheme is compared with returns from participating in current annual acreage diversion programs. The relative effects on owner-operators, landlords and tenants are assessed. Fifth, the feasibility and potential effects on production of targeting land retirement to achieve conservation objectives (i.e. a program similar to the adopted conservation reserve) are explored. Sixth, limitations of the analysis are discussed. In the concluding section, the problems and trade-offs inherent in implementing the proposed program are identified.

Why Program Costs Could Be Reduced Under A Long-Range Land Retirement Program

In theory, the cost of achieving a given level of adjustment in production will be less under a long-range land retirement scheme than under annual acreage diversion programs whose provisions or existence may change from year to year. Without guarantees that annual programs will be offered in the future or that provisions will be acceptable, farmers are reluctant to make the long-range adjustments in their capital and labor that would lead to lower levels of production. Thus, payments under a voluntary annual program must be sufficient to compensate them for what they would have earned if they had not temporarily idled their equipment and labor and if their diverted acres had been planted to the program crop [Robinson, 1966]. With the program guarantees of a long-range program, farmers can safely adjust their capital and labor to reduce production. This lowers farmers' costs of program participation which should then reduce government costs as well.

In practice, a long range land retirement program provides an opportunity to reduce program costs by modifying provisions relating to tenant compensation. Current annual programs partition benefits between landlords and tenants according to crop shares. This partitioning is appropriate for annual programs because part-owners and tenants under-employ their labor and capital, as do owner-operators. Under a long-term program,

there is less justification for compensating tenants on a continuing basis because they may have the option of renting other land or selling their equipment and accepting alternative employment. Tenants would be adversely affected by a long-range land retirement program, however, and for this reason, a compelling case can be made for offering them some compensation. Such compensation need not be for the full term of the contract or equivalent to that offered under current annual programs. Reducing the level of tenant compensation would reduce program costs. Ways to accomplish this in an equitable fashion are discussed below.

Conceptually, land compensation should be the major component of program costs if acreage targets are low enough to be met by participating non-operator landlords and owner-operators with alternative uses for their labor, buildings, and equipment. Given the large amount of cropland already rented in the United States, it should be possible to idle substantial areas of land under long-term contracts at a cost per acre not much above current land rental rates.

This point is illustrated for the Great Plains in Table 1. According to estimates from the 1982 Census of Agriculture, over 70 percent of the total area devoted to crops in the Great Plains is now farmed by part-owners or tenants.[2] Rented land accounts for 40 percent or more of all crop acres in five of the eight principal wheat producing states in the region.

Table 1. Proportion of Harvested Cropland Acres Rented or Farmed by Part-owners and Tenants, Eight Great Plains States, 1982

	Proportion of Crop Acres:	
	Farmed by Part-Owners and Tenants	Rented by Part-Owners and Tenants
Colorado	71	33
Kansas	80	49
Montana	73	27
Nebraska	76	27
North Dakota	80	48
Oklahoma	75	40
South Dakota	76	40
Texas	75	42

Source: Estimated from the 1982 Census of Agriculture by a procedure outlined in Jagger (a), p. 126.

[2] Part-owners own some land and rent additional land to make more effective use of their labor and equipment.

Guidelines for a Long-Range Land Retirement Program

The following program guidelines are designed to provide equitable treatment to tenants, to protect local communities and agribusiness firms from adverse impacts, and to reduce program costs relative to current annual programs.

1. Participation is voluntary. Rhetoric to the contrary, neither farmers nor Congress appear eager to return to the kinds of mandatory commodity programs that were in effect during the 1950s.[3] Mandatory programs did not restrict production sufficiently to solve overproduction problems [Paarlberg, pp. 213-217]. The programs did, however, restrict farmers sufficiently that farmers voted them down [Hadwiger and Talbot].

2. Landowners decide whether or not to enter the program. Despite the sizable proportion of land farmed by tenants, decisions on entry of land into the program should be based on negotiations between the landowner and the government. Inclusion of tenants in this decision would complicate the process. Tenants should be afforded all the protection that they normally receive in dealings with landowners and leases must be enforced but tenants should not have the power to withhold participation.

3. Contracts for retiring cropland are for a ten year period. Establishing the term length of long range contracts involves trade-offs. A longer term provides more stability for both participants and the government. It allows fixed costs of establishing cover and tenant compensation to be spread over more years. A shorter term allows policymakers to re-evaluate program performance more often--an advantage given uncertain commodity markets.

4. A participant can retire either all or part of the farm. No premiums will be paid for whole farm participation. Contrary to conclusions in much of the policy literature [Brandow], whole farm land retirement will probably not be cheaper nor incur less slippage than part-farm retirement. Some land will be retired at the land rental cost under either a whole farm or part farm long-term program; some land will require additional compensation--especially if rented land is allowed into a program and tenants

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[3] A survey by Guither et al. found that only a minority of wheat producers favored mandatory production controls. In the 1986 non-binding wheat referendum a small majority of wheat producers voted in favor of mandatory production controls. Only one-fourth of eligible producers voted in the referendum, however, a substantially lower proportion than voted on binding wheat referendums of the 1950s and 1960s.

are compensated. Slippage is a problem under either type of program. For a program targeted to certain crops, a whole farm program may cause greater slippage if payments are made for retiring all crop acres. Under both types of programs, production may be intensified on other farms [Jagger (b)].

5. Both tenants and landowners receive program benefits. Landowners receive annual payments for retiring cropland and for establishing and maintaining conservation practices. Tenants receive a one-time payment to compensate for the enterprise adjustments they are forced to make. Owner-operators putting land in the program receive both landlord and tenant payments.

To bring land into a voluntary land retirement program, sufficient incentives for the landowner must be provided. Tenants have an investment in the land they farm, though. Loss of part of that land may require farm reorganization; shifting to other land may increase costs. Current annual program benefits are shared between landowners and tenants according to their normal contribution to production. Because a tenant's contribution in a long-range program is negligible, a one-time payment to compensate tenants for adjustments they are forced to make is appropriate.

6. Program administrators solicit bids from landowners wanting to participate in the program. Bids are in the form of a payment rate per bushel of established yield for the land to be retired. It is assumed that land with the lowest bids will be accepted for the program subject to limits on the total amount of land to be retired in a given area.

Economists have argued that bid programs, where the government accepts or rejects bids from farmers, are more efficient than flat rate offer programs, where the government sets a rate and farmers choose whether or not to enter the program [Rudd, pp. 72-73]. This conclusion is based on the assumption that some farmers will be prepared to offer their land at lower prices than the offer rate. Theoretically, unearned rent would be eliminated under a bid program, thus lowering program costs.

7. Tenant compensation payments are calculated as a percentage of payments to landowners. This percentage would be specified by Congress. Setting tenant compensation at a percentage of landowner compensation would simplify program formulation and administration. Congress is the proper forum for determining this percentage because it routinely handles equity issues.

8. Annual commodity program crop bases for all farms of a landowner are fixed as of the reserve contract date. Participants in the reserve program are prohibited from increasing the area planted to program crops on all farms. Sodbuster provisions

would apply, thus limiting the conversion of fragile grasslands to cropland.

A land retirement program will be less effective in reducing output if the cropland base is expanded. Under a voluntary program, expansion by non-participants cannot be stopped but expansion on other farms of participants can be. Because the proposed program explicitly focuses program responsibility on landowners, this provision can be imposed on landowners with multiple tenants. Sodbuster provisions are designed to discourage planting on vulnerable land.

9. Grazing is permitted on program land. Haying would be allowed only under special circumstances as determined by the Secretary of Agriculture. Allowing the use of program land for grazing or alternative uses is justified for two reasons. First, farmers may reduce program bids to reflect earnings from alternative enterprises. This would reduce program costs. Second, farmers may keep land out of crop production after contracts expire because they have reorganized their operation around the alternative enterprises.

10. Limits are imposed on the percentages of total cropland and tenant operated cropland that could be accepted in the program in each county. Such restrictions are designed to limit the impact on the local economy and to minimize potential adverse effects on tenants.

11. Reserve payments stop at the end of the contract period. Phased re-entry of land into production occurs whenever the ratio of ending wheat stocks to production falls below a target level specified by Congress. If stocks decline and prices rise, some long range "reserve" land may be needed to increase production before the end of the contract period. An early release mechanism should be specified in advance and based on an automatic formula not subject to discretionary administrative decisions. The release formula should be spelled out by Congress.

Phased re-entry prevents short run over-reaction to perceived market signals, reduces demand pressure on farm input markets, and preserves conservation investments. A stock related release mechanism avoids some of the problems associated with price related mechanisms. Problems of price-related mechanism are related to inflation and exchange rate fluctuations, price and income support programs, and data collection procedures [Jagger (a), pp. 110-116]

Estimated Cost of Retiring Wheat Land in the Great Plains

In this section, the costs of implementing a ten year land retirement program targeted to wheat acres in the Great Plains are estimated. These estimates are based on the preceding guidelines. There are two major types of program costs associated with program payments to farmers: land compensation and non-land compensation. Non-land compensation includes both tenant compensation and other program costs (see below). Tenant compensation is assumed to be a percentage of land costs.

Estimation Procedures

Program land costs are assumed to equal current cash rents. To reduce output at least cost, land should be retired in areas where the land rent per bushel of yield is the lowest. Average and marginal costs of retiring a given quantity of land can be estimated by constructing a cost curve showing the average cash rental rate per bushel of wheat as higher-cost land is brought into the program.

To identify the least-cost pattern of land retirement, annual rental rates per acre had to be converted into an average land cost per bushel by dividing prevailing rental rates by average yields. Ideally, one would like to know the yield and current rental rate for each region, grade or type of land, but, unfortunately, such data are not available even by counties. One has to rely on regional data and average yields for areas that encompass varying types or qualities of land.

Land Rental Rates. Estimates of average rental rates are available for NASS (National Agricultural Statistics Service, formerly, Statistical Research Service) crop reporting districts. Such districts consist of several adjacent counties. Unpublished data for 1984 on cash rental rates for two categories of cropland (irrigated and non-irrigated) were obtained for all crop reporting districts in the Great Plains region.

Although much of the wheat acreage is rented on shares, cash rent was used in the analysis of costs. This was done for two reasons. First, cash rental data are more readily available. The level of share rents is a function of input and output prices and yields. Data for all of these variables are not available for all districts. Second, cash renting rather than share renting is a strategy which likely appeals to risk averse landowners. A government land retirement program is likely to appeal also to risk averse landowners. Thus, cash rents may reflect more accurately the preferences of likely participants in a land retirement program.

One problem with the NASS cash rent data is that NASS statisticians in most states question the statistical reliability of data at the crop reporting district level. They consider the sample size within each district to be too small. Such data, however, appeared to be the best available and consequently were used to make the cost calculations.

Another problem is that NASS cash rent data reflect rates prevailing for all types of cropland and all crops. To determine the rental cost per bushel of wheat, it is necessary to convert yields from different crops for each district to equivalent wheat yields. The procedure used to adjust yields is described below.

Yield estimates. Separate yield data for summer fallow, continuously cropped and irrigated wheat production and harvested acreage for the crop years 1981 through 1983 were obtained from NASS. From these data, the three year average wheat yield was calculated for each cropping practice. The average yield probably is biased upward slightly as poorer continuously cropped land likely was retired from production under the 1982 and 1983 wheat diversion programs.

A weighting system for yields was devised to reflect current patterns of land use and land qualities. The weights attached to yield estimates were derived from reports of the harvested acres of important crops in each crop reporting district. Census data relative to irrigated land were used to supplement the information provided by NASS.

Average yields were calculated for four categories of land use: fallow, two types of continuously cropped dryland, and irrigated land. For fallow land, the yield estimate was based on average wheat yields reported for fallow wheat for 1981 through 1983. Dryland I yields were based on the same three year average yield for continuously cropped wheat. Dryland II yields (assumed to be those prevailing on more productive land) were estimated to be 115 percent of the average yields for Dryland I wheat. Irrigated wheat yields were based on the average yields reported for such land for 1981 through 1983. Weighted average yields for non-irrigated land in each district were obtained by multiplying average yields for each category of land by the proportion of dryland represented by each category in that district.

Land Cost per Bushel of Production. Average land costs per bushel were estimated separately for irrigated and non-irrigated land in each district. Prevailing cash rental rates were divided by the adjusted (weighted) wheat yield estimated for each district and for each type of land. For non-irrigated land, this calculation was based on the proportions of continuously cropped and summer fallow land.

Summer Fallow Acres. The treatment of fallow land in estimating rental costs presents special problems. To gain participation in the summer fallow areas, it may be necessary to compensate owners for fallow land as well as land that otherwise would be planted to wheat.[4] Costs per bushel of retired production will be higher than if no fallow compensation were paid. This increase in program costs may be offset by attracting more land in low cost areas where fallowing is common. Average land costs per bushel are lower in the western part of the Great Plains. By paying fallow compensation, more land may enter the program from these regions, thereby helping to hold down total program costs.

Costs were estimated under three sets of assumptions regarding rental rates paid for land in summer-fallow areas. Under the first set of assumptions, rental rates are based solely on the cost per bushel of land planted to wheat; no compensation is paid for summer fallow land. Under the second set of assumptions, bids are accepted on the basis of land cost per bushel of wheat on planted acres, but successful bidders are then compensated for fallow land. This increases total program costs relative to the first set of assumptions but does not change the geographical distribution of retired cropland. Under the third set of assumptions, farmers are assumed to add 25 percent to land rental rates per bushel (calculated on the basis of yields on planted acreage) to compensate for fallow land.

It is not clear what procedure farmers in wheat-fallow areas would use in calculating their bids. Most of the empirical results which follow are based on the first set of assumptions, namely that fallow compensation is not included in land rental costs. This undoubtedly biases cost estimates downward.

Constructing Program Cost Curves. Crop reporting district land rental rates adjusted for yield are assumed to represent the bids which landowners would submit to the government. It was also assumed that a fixed proportion of wheat acres (alternatively, 30, 50, or 100 percent) was retired from each district entering the program. With these assumptions, cost curves were constructed for program land. The 30 percent cost curve is used for most analytical purposes because 1) assumed program guidelines allow only 30 percent of district land to enter the program, and 2) it would be unrealistic to assume that all land from a district would enter a program at prevailing average land rental rates.

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[4] Wheat farmers now receive benefits equivalent to fallow compensation. Under annual acreage diversion programs, land which would normally be idled for summer fallowing purposes can be used to meet conserving use acreage requirements. With such a provision, wheat acres are reduced but acres of other crops may increase. The value of this program provision is equal to the returns from alternative crops grown on the "summer fallow" land [Jagger (b), pp. 122-124].

The 30 percent land rent cost curve (or program supply curve) is shown in Figure 1. Each step in the function represents the marginal cost of bringing in land from additional crop reporting districts. The incremental costs of bringing in additional land are small over the central range, but rise sharply thereafter.

Total costs obviously are a function of the magnitude of the adjustment required. As more land must be attracted into the program in order to achieve national goals, average costs per bushel of retired production will increase. Consequently, total costs at some point start to rise at an increasing rate.

Non-Land Costs. Land costs are only one element that must be considered. To such costs must be added tenant compensation and payments for establishing and maintaining cover on retired land. For completeness, administrative costs also should be included, but because there is little basis on which to estimate such costs, they have been omitted. Tenant compensation costs are based on an assumed one-time, first year payment equal to twice the land rental cost. Estimates of the costs of establishing permanent vegetative cover are based on those reported as paid by the U.S. Department of Agriculture in 1983 for land set aside under long-term Agricultural Conservation Program Agreements. An average per acre cost for the eight states was determined by weighting the per acre state cost by the proportion of total wheat acres in each state. The weighted average cost for the eight Great Plains states was $21.61 per acre [Jagger, 1986, pp. 127].

Program Magnitude. Because estimates of the amount of excess capacity in wheat production are highly variable, no single target for land retirement was assumed. Instead, four levels of national acreage reduction were hypothesized: 6, 11, 15 and 22 million acres. The 6 million acre program was chosen arbitrarily as a lower bound. The 11 and 15 million acre programs represent the size range that Jagger (a) concluded would be appropriate for a long range program initiated in the mid-1980s. He noted that annual acreage diversion programs could be used for additional production adjustment as needed [pp. 40-47]. The 22 million acre figure is based on a USDA estimate of excess capacity published in 1986 [USDA, 1986].[5] These figures were multiplied by 70

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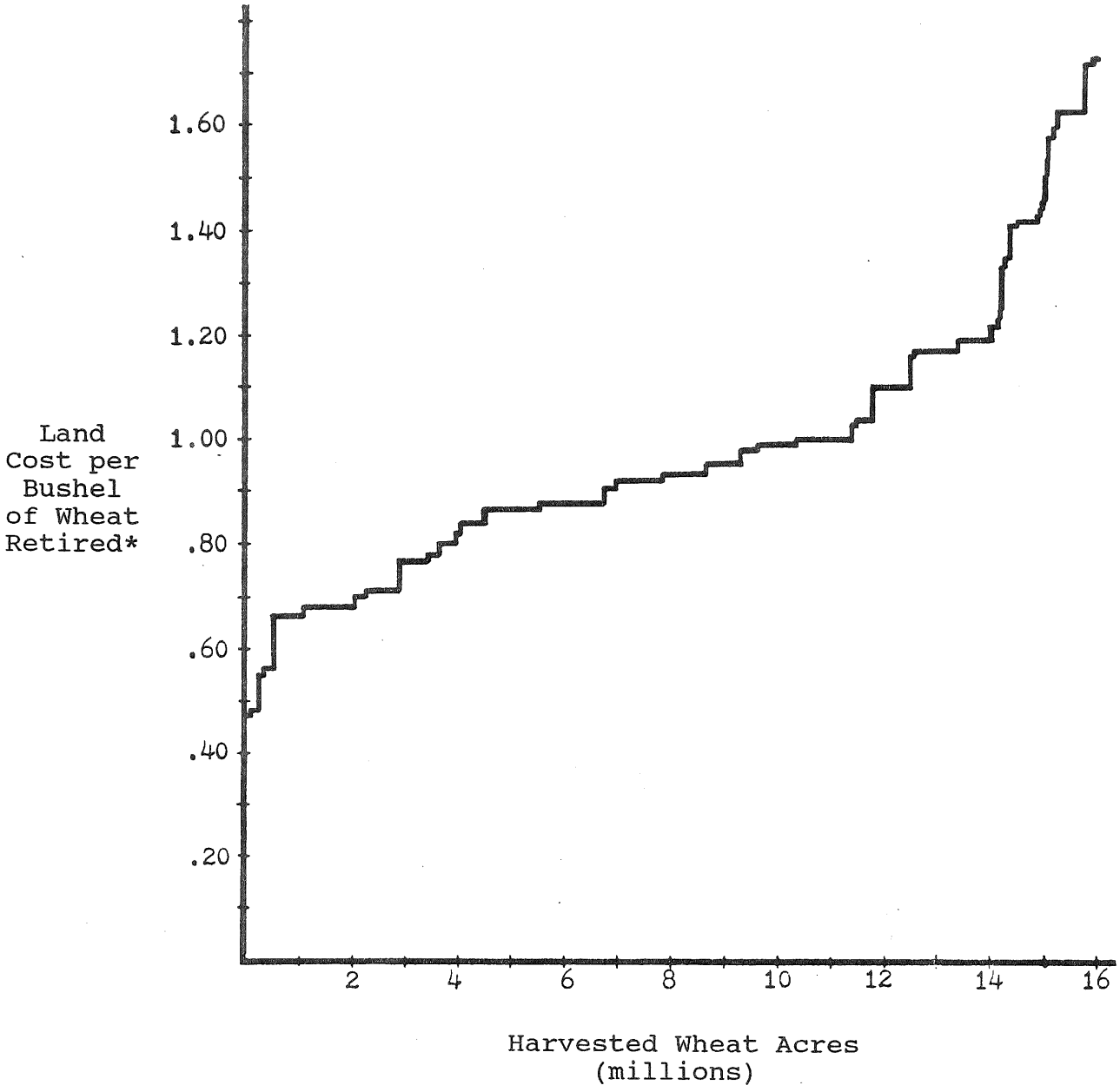
[5] A 22 million acre program is equivalent to setting aside 24 percent of the 1986 base acreage for wheat (91.7 mil. acres). In 1986, farmers were compelled to idle 25 percent of their base acreage in order to qualify for loans and price-support payments. For the 1987 crop, the acreage reduction requirement was raised to 27.5 percent. Thus, a 22 million acre longer-term land retirement program for wheat would not differ greatly in magnitude from recent annual set-aside programs.

Figure 1. Cost Per Bushel of Renting Wheat Land, Eight Great Plains Wheat Producing States.



* Land cost only--no tenant or fallow compensation. Assumes 30 percent of wheat acreage by cropping practice is retired from each district entering the program.

percent to establish goals for retired acreage in the Great Plains of 4.2, 7.7, 10.5, and 15.4 million acres.[6]

Results

District Land Costs. Average land costs per bushel on continuously cropped wheat land for all crop reporting districts in the Great Plains are shown in Figure 2. Costs are coded by 10 cent intervals. Districts coded with a 60 are those in which land costs are less than 70 cents per bushel; districts labeled with a 70 have costs ranging from 70 to 79 cents per bushel and so on. Calculated land costs ranged from 47 cents per bushel for dryland wheat in west central South Dakota to over $3 per bushel for some irrigated wheat land.

Estimated average land costs per bushel by crop reporting districts for summer fallow land, assuming fallow compensation, are shown in Figure 3. Several districts in Montana, South Dakota, Kansas and Colorado have calculated land costs of less than $1 per bushel even when the assumption is made that land owners will be compensated for fallow land.

Total Program Costs for Alternative Program Magnitudes. Estimated total program costs incorporating land rental costs, payments for establishing permanent cover and tenant compensation are summarized in Table 2. The underlying assumptions are that 30 percent of all wheat land in low-cost districts is placed in the program and that no fallow compensation is paid. Costs have been estimated for the Great Plains based on 4 levels of program size. First year costs include an allowance for tenant compensation and for establishing permanent cover; subsequent annual costs (years 2 to 10) are based solely on estimated land rental costs. Average annual costs over the 10 year period are indicated in the last column.

First year costs rival those incurred under current annual programs; however, costs for subsequent years are much lower. The average annual cost per acre for the 10 year period would amount to about $28 per acre for a 4 million acre program, a bit over $30 per acre for an 8 million acre program, and around $40 per acre for a 15 million acre program. Doubling the target acreage from 7.7 to 15.4 million acres more than doubles the total cost because per acre costs rise by 29 percent. If fallow compensation were to be paid, costs obviously would be somewhat higher.

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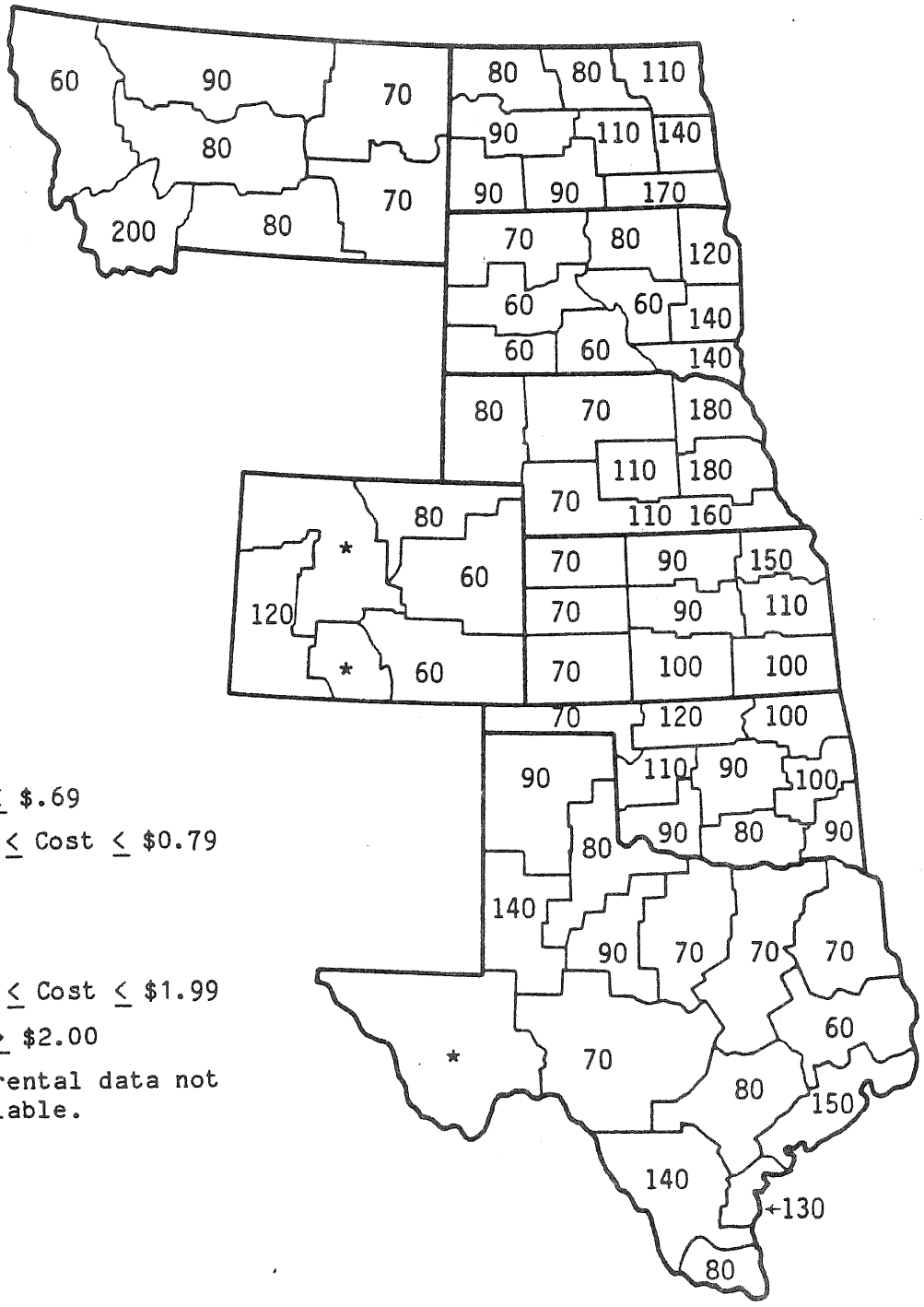
[6] In the early 1980s, wheat growers in the Great Plains accounted for approximately 65 percent of harvested wheat acreage and 60 percent of total production. If double-cropped wheat in the southeast is excluded on the assumption that it will be cheaper to purchase the required adjustments in other areas, the proportion of the national targeted acreage allocated to the Great Plains would amount to around 70 percent.

Figure 2. Land Rental Cost Per Bushel of Wheat Production. Continuously Cropped Land by District.



KEY:

60: Cost $\leq$ \$.69

70: \$0.70 $\leq$ Cost $\leq$ \$0.79

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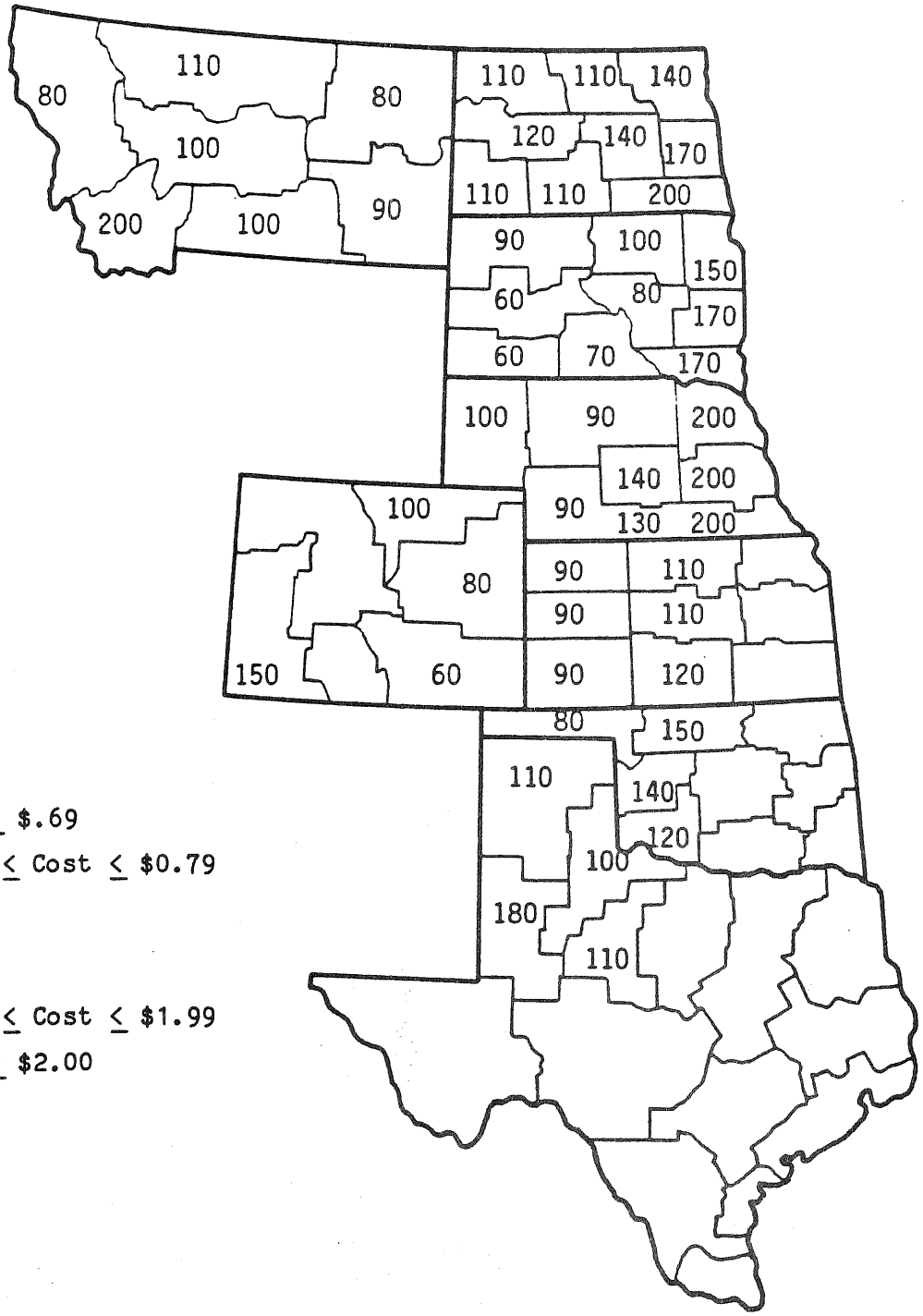
190: \$1.90 $\leq$ Cost $\leq$ \$1.99

200: Cost $\geq$ \$2.00

* : Land rental data not available.

Figure 3. Land Rental Cost Per Bushel of Wheat Production. Summer Fallowed Land by District. Fallow Compensation Incorporated into Bids.



KEY:

60: Cost $\leq$ \$.69

70: \$0.70 $\leq$ Cost $\leq$ \$0.79

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190: \$1.90 $\leq$ Cost $\leq$ \$1.99

200: Cost $\geq$ \$2.00

Table 2. Annual Program Costs Incorporating Land Rental Costs, Payments for Establishing Permanent Cover, and Tenant Compensation*

Program Size	Production Adjustment	Annual Cost		
		Year 1	Year 2-10	Average, Year 1-10
(mil.acres)	(mil. bu.)	----------million dollars----------		
4.2	126	364	91	118
7.7	227	709	181	234
10.5	317	1034	269	346
15.4	485	1758	475	603

* Assumes 30 percent of wheat acreage by cropping practice is retired from each district entering the program and that no fallow compensation is paid. Costs of establishing permanent cover are based on the eight state weighted average.

Costs of a 15.4 million Acre Program Under Alternative Assumptions. The magnitude of changes in total program and per acre costs that might be anticipated under different assumptions regarding fallow and tenant compensation and the proportion of acreage retired from each district entering the program are indicated in Table 3. The figures are based on a 15.4 million acre program.

If fallow and tenant compensation payments were made, for example, total program costs would exceed land rental costs by $100 million, i.e. total program costs would rise from $339 million to $438 million for a 15.4 million acre program. This assumes that 100 percent of wheat-related land is retired from each low cost district entering the program. When it is assumed that only 30 percent of the land is retired from each district entering the program, total program costs would rise by more than $100 million if payments for tenants and fallow compensation were added to land rental costs. Comparable figures for a 7.7 million acre program are shown in Appendix A.

Table 3. Total Program Cost and Per Acre Costs of a 15.4 Million Acre Program Under Alternative Assumptions Regarding Acreage Restrictions, Fallow and Tenant Compensation*

Average Annual Program Cost		Production Adjustment	Percent of District Acres Retired**	25% Fallow Compensation	Tenant Compensation
Total	Per Acre				
(mil.$)	($/A)	(mil. bu.)			
339	22.04	463	100	no	no
365	23.71	435	100	yes	no
380	24.70	460	50	no	no
407	26.45	464	100	no	yes
438	28.45	435	100	yes	yes
439	28.53	473	50	yes	no
456	29.64	460	50	no	yes
475	30.83	485	30	no	no
516	33.53	484	30	yes	no
527	34.23	473	50	yes	yes
570	36.99	485	30	no	yes
620	40.24	484	30	yes	yes

* Total program cost excludes costs of establishing and maintaining cover crops and administrative costs.

** Percentage of wheat acreage by cropping practice assumed retired from each district entering the program.

An Offer vs. a Bid System. The conventional analysis of the difference in costs between a flat rate offer system and a bid system is based on a program supply curve similar to Figure 1 (except the vertical axis represents per acre rather than per bushel costs). Program land costs under a flat rate offer system are assumed to equal the area under a horizontal line drawn from the marginal acre on the supply curve to the vertical axis (the average cost per acre of retiring land is equal to the marginal cost of the last acre retired). Program land costs under a bid system are assumed to equal the area under the program supply curve between the marginal acre and the origin (the incremental cost rises as more acres are retired, but the average cost for all acres retired is less than the marginal cost). The area below the horizontal line and above the program supply curve is assumed to represent the difference in costs between the bid system and the offer system for the same size program.

Based on these principles, program costs were compared under a bid and offer system for a 10.5 million acre program. Assuming 30 percent of wheat acres are retired in each district entering the program and no fallow compensation is paid, total costs would amount to $317 million under an offer system and $269 million under a bid system. The marginal cost per acre would be $30.19 under both systems. The average cost per acre would also be $30.19 for the offer system but would be $25.58 for the bid system.

The difference between costs of a bid system and an offer system will change according to the program size and program assumptions. Percent increases in total program costs associated with shifting to an offer rather than a bid system (assuming tenant compensation) are shown in Table 4.

Table 4. Percent Increase in Cost Under an Offer Rather Than a Bid System*

Size	Percent Increase Over Bid System With Tenant Compensation
(mil. acres)	
4.2	8
7.7	17
10.5	18
15.4	66

* Assumes 30 percent of wheat acreage by cropping practice is retired from each district entering the program and that no fallow compensation is paid.

Geographical Distribution of Retired Land

The foregoing average district land costs per bushel were used to determine where land might be retired under successively larger programs, assuming land in low-cost districts is retired first. Figure 4 shows the geographical distribution of retired land that is continuously cropped when 30 percent of the land is retired from each district entering the program and no fallow compensation is paid.[7] Continuously cropped wheat land in western South Dakota and eastern Colorado would enter a program first. Irrigated land in northwest Nebraska would be the last to enter a program.

The geographical distribution of idle land changes when fallow compensation is incorporated into bids (Figure 5); continuously cropped land from other areas is relatively cheaper and fallow acres are ranked lower in the sequence of bids. For example, when no fallow compensation is paid, continuously cropped land in the north-central and south-central Kansas districts would not enter a program targeting 7.7 million acres of wheat land. Land from these districts would enter a 7.7 million acre program when fallow compensation is paid.

When an upper limit of 30 percent of all crop land is imposed, land from almost all crop reporting districts in the Great Plains would enter a 15.4 million acre program. Large areas of wheat land are idled in Colorado, South Dakota and Texas even with a modest 4.2 million acre program.

The foregoing analysis is based on average rental rates and yields for each crop reporting district. Obviously there are substantial differences within districts as well as between districts in both yields and rental rates. For this reason, one would likely find some land owners willing to enter into a longer-term land retirement scheme at relatively low payment rates even in districts where average land costs per bushel of wheat yield are relatively high.

In the absence of restrictions on the proportion of land that can be idled in any one county or district, one might expect a higher proportion of land to be retired in districts with low average costs per bushel of wheat. The 30 percent limit not only simplifies the analysis but reflects similar restrictions adopted for the 1986 conservation reserve. Under a 30 percent limit, the regional impact of a long range program would differ little from that recently experienced under annual acreage diversion programs. Local communities and agribusiness firms in areas of high participation in annual programs have had to contend with annual acreage diversion or set-aside requirements for wheat of nearly this order of magnitude since 1983.

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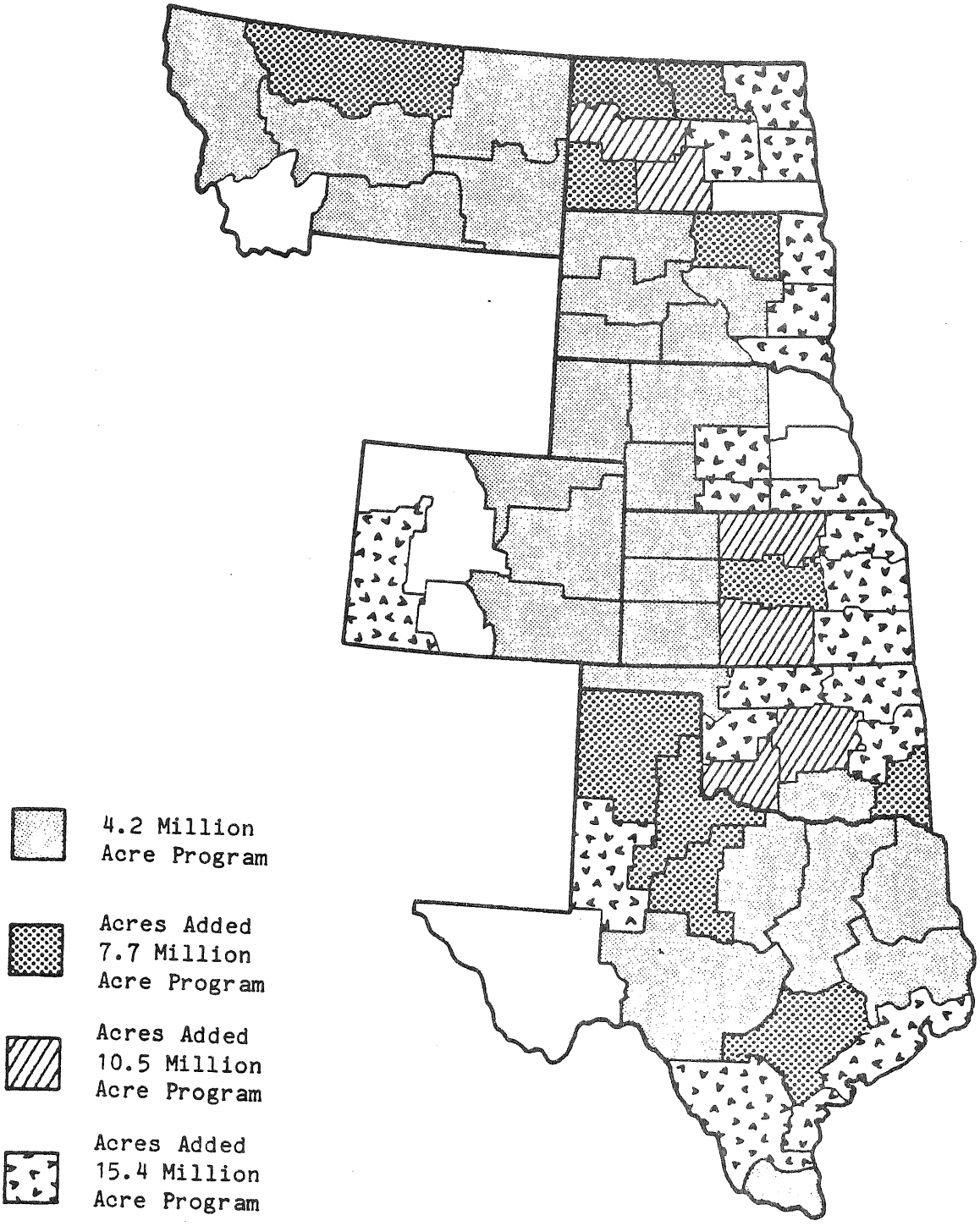
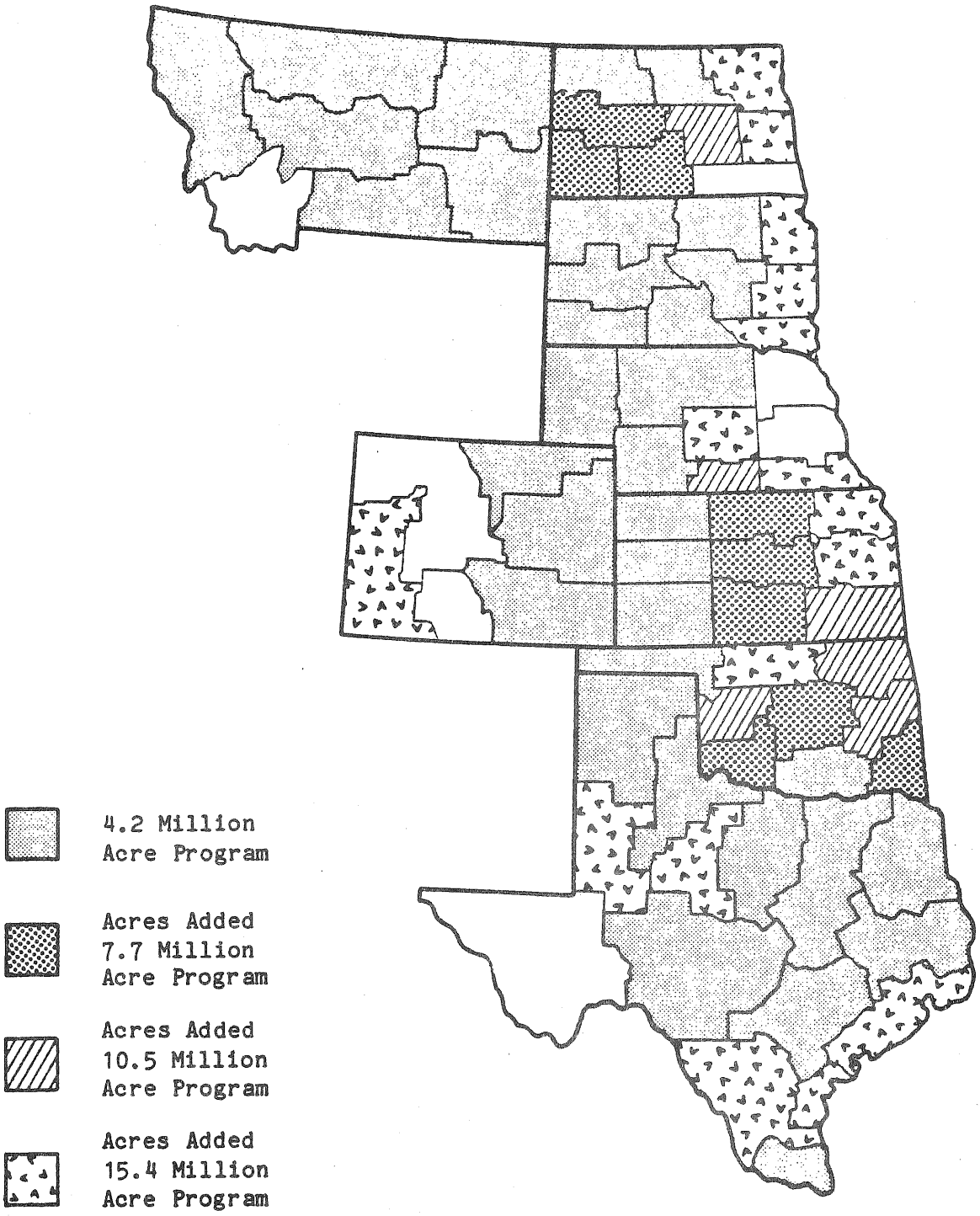
[7] Maps showing the geographical distribution of retired fallow and irrigated land can be found in Jagger (a), pp. 140-145.

Figure 4. Geographical Distribution of Continuously Cropped Wheat Acres Idled, Assuming Varying Program Levels and No Fallow Compensation.*



* Also assumes that 30 percent of land is idled in each district.

Figure 5. Geographical Distribution of Continuously Cropped Wheat Acres Idled, Assuming Varying Program Levels and Fallow Compensation.*



* Also assumes that 30 percent of land is idled in each district.

Relative Returns from Participating in a Long-Range Land Retirement Scheme vs. Current Annual Set-Aside Programs

Farm operators not wanting to retire will have little incentive to participate in a long range land retirement scheme if returns from signing up under such a program are less than they would earn if they continue to grow wheat and participate in annual acreage reduction programs. With low participation, much of the saving that could be accomplished by a long-range land retirement program will not be realized. In order to assess the profitability of a ten year land retirement scheme relative to annual support programs, typical farm budgets for owner-operators, tenants, and landowners were constructed based on farm management data for continuously cropped wheat in north central Kansas.

The benefits of participation for tenants and owner-operators depend on annual program benefits and provisions, the type of participation, machinery salvage values, and off-farm employment opportunities. Those with land to rent are indifferent to program participation because program payments from the government are assumed to be equivalent to their cash returns from renting to tenants.

Estimation Procedures

For those choosing to place part of their land in the program, the annual gain or loss from program participation can be measured by subtracting returns above non-land cash costs under an annual program from payments under a long-run program. The net present value (NPV) of program gains and losses over the ten year contract period measures the benefits to farmers of participating in a long run program. These benefits were calculated with and without returns from alternative off-farm employment. For those choosing to quit farming and to place all of their land in the program, salvage value from sale of machinery must be added to first year program payments in the NPV determination.

Costs. Cost estimates were based on 1984 production costs. All production costs except one-third of the fertilizer cost were assumed to be borne by tenants. Owner-operators were assumed to pay all production costs.

Returns. Several different scenarios for returns were examined. The baseline scenario incorporated price and diversion provisions from the 1985 wheat program. A second scenario reduced the loan rate and diversion payment by ten percent while maintaining the 1985 target price and diversion requirements. A

third scenario eliminated the loan rate, target price, and diversion requirement and hypothesized a lower market price. Returns are sensitive to variations in yields. The first three scenarios assumed a 32 bushel yield. A fourth scenario used price and diversion provisions from the 1985 wheat program but assumed a 25 bushel yield.

Program payments. The program land payment was set equal to land rent. Land rent was assumed to be one-third of gross receipts less one third of the fertilizer cost. Tenant compensation was assumed to be a one-time payment of twice the land rent. Owner-operators were assumed to receive both landowner and tenant payments.

Discount Rate. A discount rate of 6 percent was used for the net present value determination. The 6 percent rate represents the real interest rate for land used in the Kansas crop budgets.

Machinery Salvage Value. For a farmer placing all of his land into a long-run program, a machinery salvage value of $100 per acre was added to the first year program payment--a 20 percent reduction from the $125 per acre depreciation expense used in the Kansas budgets. This deduction was made to reflect weak used machinery markets.

Off-farm employment. Returns from off-farm alternative employment were assumed to be equivalent to the implicit per acre value of farm labor from the Kansas budgets. Off-farm employment is not always available. Farmers who quit farming because they are of retirement age would probably not seek off-farm employment.

Results

The most important conclusion from this budget analysis is that owner-operators not wanting to retire would have little incentive to participate in the proposed long range program given annual program provisions close to those mandated for 1986 and 1987 by the Food Security Act of 1985. If landlords entered land into the long range program, tenants would be worse off unless they retired or found other land to rent. One way to increase program participation and reduce program costs would be to reduce annual commodity program benefits.

These conclusions are based on the assumptions and results presented in Tables 5, 6, and 7. Table 5 shows the price, yield, and acreage diversion assumptions used to establish alternative scenarios. All scenarios apply to continuously cropped wheat in central Kansas. Costs are for the 1984 crop year. Price and acreage diversion assumptions are based on those prevailing in 1985. Scenarios A and D represent provisions under the 1985 annual wheat program.

Table 5. Alternative Support Price, Market Price, Acreage Diversion, and Yield Assumptions for the Relative Returns Analysis.

Scenario:	A	B	C	D
Market Price ($/bu.)	3.25	2.92	2.92	3.25
Loan Rate ($/bu.)	3.30	2.97	0	3.30
Target Price ($/bu.)	4.38	4.38	0	4.38
Diversion Rate ($/bu.)	2.70	2.43	0	2.70
Yield (bu./acre)	32	32	32	25
Acres Paid Diversion (%)	10	10	0	10
Acres Unpaid Diversion (%)	20	20	0	20

Relative returns per acre of wheat land from participation in a long range program vs. annual programs are reported in Table 6. The analysis is based on the alternative scenarios outlined in Table 5. Returns under alternative assumptions regarding annual programs are indicated in the third column. Comparable estimates of returns under a 10-year program are shown in the next two columns. Differences in returns between the proposed long-term program and alternative annual programs are shown in the last two columns. The negative figures indicate that benefits from participating in a 10-year land retirement program would be less than those earned by continuing to grow wheat and signing up under annual programs. For example, under Scenario A (1985 program provisions), a typical owner-operator would earn $56 per acre over non-land cash costs by continuing to grow wheat. Under a 10-year program, first year compensation (including the equivalent value of tenant compensation) would amount to $96 per acre. Payments in subsequent years would amount to only $32 per acre. Thus, while first-year payments would be greater than the budgeted return under recent annual programs, those in the remaining 9 years would be less. Landlords would be indifferent because it is assumed their long-term rental bid would equal the returns they now obtain from tenants. Results based on Scenarios B and C indicate how participation might be affected by a reduction in annual program benefits. Less attractive annual programs would narrow the difference in returns for owner-operators and also would lead to lower bids by land owners, thus reducing overall program costs.[8]

[8] Lowering support prices would eventually reduce the magnitude of excess capacity by stimulating demand and reducing production. A smaller long range program would then be appropriate. This, too, would reduce program costs.

Table 6. Relative Returns from a 10 Year Land Retirement Program and An Annual Program Under Different Program, Tenure, and Yield Assumptions*

	Scenario (a)	Return Over Non-Land Cash Cost (b)	Long Run Program Annual Payment Year 1 (c)	Long Run Program Annual Payment Year 2-10 (d)	Annual Gain From Long Run Program Year 1 (b-c)	Annual Gain From Long Run Program Year 2-10 (b-d)
		(dollars per acre)				
Landowner	A	32	32	32	0	0
Landowner	B	31	31	31	0	0
Landowner	C	26	26	26	0	0
Landowner	D	24	24	24	0	0
Owner-oper.	A	56	96	32	39	-24
Owner-oper.	B	55	95	32	39	-24
Owner-oper.	C	26	77	26	52	0
Owner-oper.	D	33	72	24	40	-9
Tenant	A	23	64	0	41	-23
Tenant	B	22	63	0	41	-22
Tenant	C	-3	52	0	54	3
Tenant	D	7	48	0	41	-7

* See Table 5 and text for assumptions. Components may not sum due to rounding.

Source: Calculated from Kenneth L. McReynolds and John R. Schlender, "Continuous Cropped Winter Wheat in Central Kansas," KSU Farm Management Guide MF-574. (Manhattan, Kansas: Kansas State University Cooperative Extension Service), August, 1984.

The figures presented in Table 6 were used to calculate the total net present value of gains over the entire 10 year life of the contract. The gains (positive or negative) are based on the difference in returns from participating in a long range program vs. annual programs under four different scenarios or sets of assumptions regarding market prices, loan rates, yields and diversion requirements (Table 5). Negative values indicate a net loss from shifting to a long-range program. The results of these

calculations are shown in Table 7. Note that both owner-operators and tenants would be worse off, assuming no alternative employment opportunities are available, under three of the four scenarios. Only if program benefits under annual programs are substantially reduced (alternative C) would owner-operators find participation in a part-farm retirement program attractive. Whole-farm participation would be attractive under both Scenario C and Scenario D. With alternative employment opportunities available, long-term land retirement becomes even more attractive for both owner-operators and tenants.

Table 7. The Net Present Value of Gains from Participating in A 10 Year Land Retirement Program under Alternative Assumptions*

	Scenario	Part farm Participation		Whole farm Participation	
		(dollars per acre)			
Off-farm employment		no	yes	no	yes
Owner-operator	A	-123	-40	-23	60
Owner-operator	B	-121	-38	-21	62
Owner-operator	C	52	135	152	235
Owner-operator	D	-20	63	80	163
Tenant	A	-111	-28	-11	72
Tenant	B	-108	-24	-8	76
Tenant	C	71	154	171	254
Tenant	D	-7	76	93	176

* See Tables 5 and 6 and text for assumptions and source. The value of off-farm employment is calculated as 1.8 hours x $6 per hour. The gain from part farm participation is calculated as the net present value of the difference between annual returns above non-land cash crops and the program payment over a ten year term. A discount rate of 6 percent is used. The gain from whole-farm participation is calculated in the same way except a salvage value for machinery of $100 per acre is added to the first year program payment.

The results summarized in Table 7 also suggest that a 10 year land retirement program would likely appeal to operators on marginal land where yields are lower. Both owner-operators and

tenants with a yield of 25 bushels to the acre (Scenario D) rather than 32 would gain from placing all of their land in the 10-year program regardless of off-farm employment opportunities. If off-farm employment opportunities were available, both groups would benefit from part-farm participation.

Targeting Long-Range Land Retirement to Meet Conservation Objectives

Most of the program guidelines outlined earlier would be appropriate for a program targeted to soil conservation. The principal change needed is to establish conservation criteria for eligible land. While the program provisions assumed are somewhat different from those of the 1986 Conservation Reserve, results from this part of the study provide a basis for comparing programs targeted to conservation and those targeted to least-cost production adjustment.

Estimation Procedures

Data from the 1982 National Resources Inventory (NRI) were used for the analysis. These data were used to determine the proportion of wheat-related land in each district that would be eligible for the program based on the two criteria discussed below. These proportions were applied to the number of wheat-related acres used in the rest of the analysis. Program costs were the product of eligible wheat acres, yield levels, and district land costs per bushel.

The 2-T Criterion. One possible criterion is to limit eligibility for participation in the program to land on which estimated erosion exceeds twice the "T" value. T values are defined as the "maximum rate of annual soil erosion that may occur and still permit a high level of crop productivity to be obtained economically and indefinitely" (Wischmier and Smith). Acceptable rates of erosion (T-values) vary by soil type and area. According to the 1982 NRI, the national average value is about 5 tons per acre per year.

Projected erosion rates for individual fields or farms can be calculated using equations designed for this purpose, namely the Universal Soil Loss Equation (USLE) and the Wind Loss Equation (WLE). These equations take into account soil properties, the slope of the land, cropping practices and the presence or absence of erosion control measures. The 2 times T (2-T) value has been widely discussed as a threshold for targeting conservation programs. The 2-T criterion will be referred to as criterion #1.

The LCC Criterion. An alternative criterion is to limit eligibility to certain land capability classes. The Soil Conservation Service classifies land into eight different

capability classes. Land Class I has few limitations while Land Class VIII is not suitable for cropping and therefore should be planted to grass or trees. Subcategory designations are used to represent the dominant production hazard: "e" for susceptibility to erosion; "w" for excess moisture; and "s" for stony soil. While potentially usable as a basis for targeting eligibility, land capability classes do not enable one to estimate soil loss directly.

Using land class as a criterion could exclude some land which has a high potential for erosion. For example, erosion rates as high as 25 tons per acre have been calculated (based on the Universal Soil Loss Equation) for some land falling in categories II and III [Ogg, Webb and Huang]. Such categories are not considered to be land with the most serious erosion problem and therefore are not always targeted by conservation programs with limited budgets. Typically, eligibility for conservation programs targeted to the most erosive land has been limited to some combination of land in Capability Classes IIIe, IVe, VI, VII, and VIII. The analysis which follows is based on the assumption that only the last four categories would be targeted for inclusion in a long-range conservation program. The LCC Criterion will be referred to as criterion #2.

Targeting Procedure. Wheat-related sampling points from the NRI were examined to see if they met either of the two criteria for program eligibility.[9] For each sampling point meeting a criterion, an expansion factor was used to estimate the number of acres represented by the targeted point. Estimated acreage for targeted points was aggregated for each crop reporting district based on the two criteria described above. This made it possible to estimate the proportion of total wheat-related acres eligible for participation in the program based on the two criteria.[10] These proportions were multiplied by the district wheat acres used in the rest of the analysis to obtain consistent estimates.

Program Costs. District costs were calculated as the product of per bushel land rental costs, yield, and targeted acres. There is some question as to how much, if any, yields differ on more erosive land compared to other land. Two yield estimates were used to estimate the levels of program costs and production adjustment: 100 percent of yields estimated earlier and 90 percent of those yields.

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[9] The term "wheat related acres" is used to designate acres that either are growing wheat or are in the fallow portion of a wheat-fallow rotation.

[10] Estimates were based on other criteria as well, including one suggested by Heimlich and Bills, but since the administrative feasibility of these other criteria was even more open to question, the results are not reported here. For a more complete discussion of alternative criteria and their limitations, see Jagger (a), pp. 207-211.

Fallow Acres. The number of acres in the fallow portion of a wheat-fallow rotation (related fallow acres) also was estimated because these acres would also need to be included in a conservation reserve. Possible compensation for these acres was discussed earlier. Even if no land rent were to be paid for these acres, payments to cover maintenance costs might be necessary.

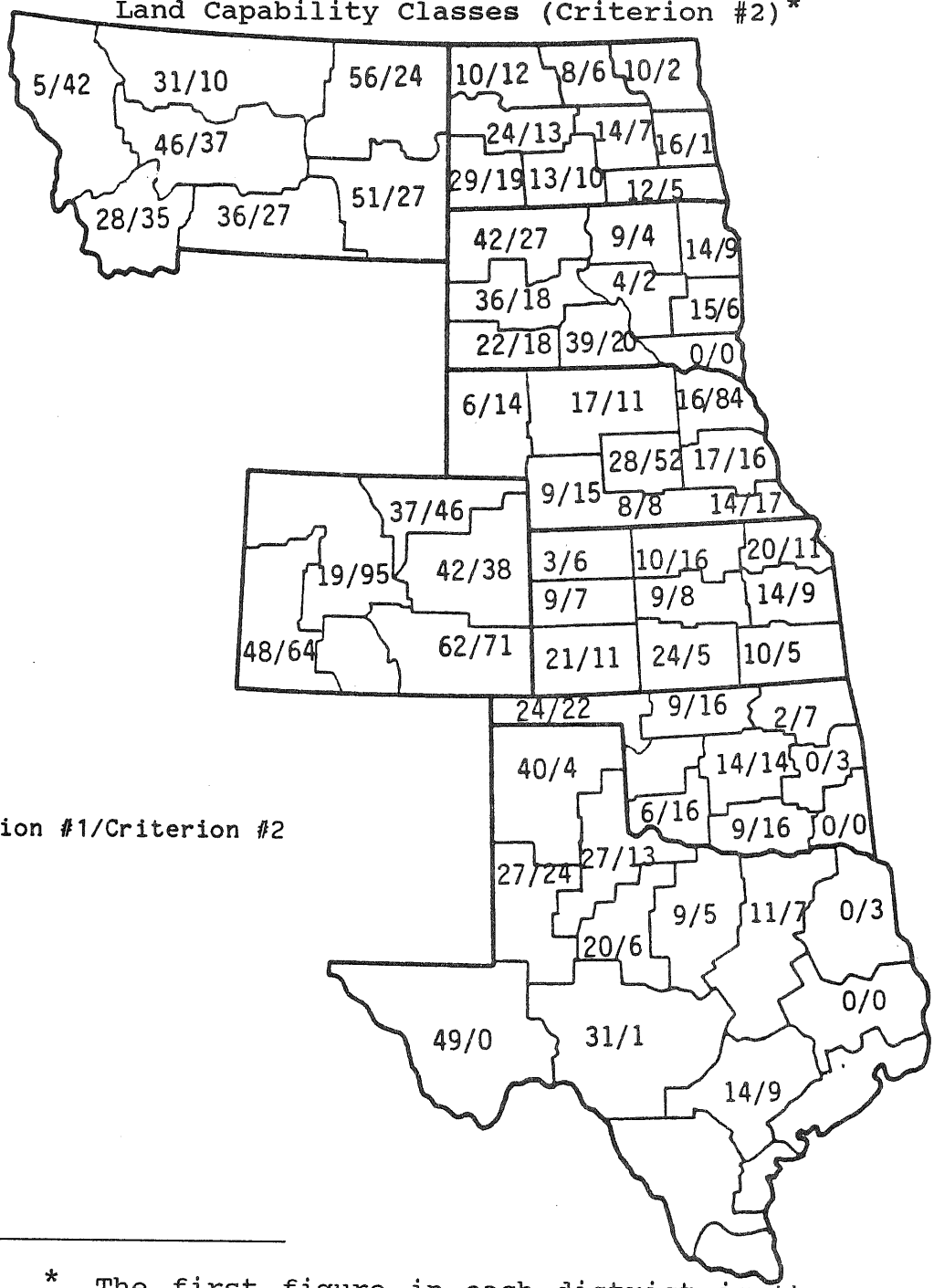
Results

Targeted Acres. The proportion of harvested wheat acres in each district that meets each of the two criteria is shown in Figure 6. The first figure in each district is the proportion of wheat land that would be eligible based on criterion #1; the second figure is the proportion that would be eligible based on criterion #2. For many districts, there is a substantial difference between the two figures, thus indicating that the criteria are not internally consistent. For example, in the most western district of Montana, only 5 percent of wheat land would be eligible under the soil loss criterion, while 42 percent would be eligible under the land capability class criterion. The ranking is reversed in the two districts just to the east. This illustrates the importance of eligibility criterion in determining where and how much land would be idled under a program targeted to conserving soil.

Acres, Costs, and Production Adjustment. Estimates of the total acreage of wheat in the Great Plains area that might be kept idle, the effect on total wheat production, and the annual cost for each of the two criteria are summarized in Table 8. Production adjustments were calculated under two sets of assumptions: first, the effect on production was estimated assuming yields on idle acres were the same as the district average; second, the effects were estimated on the assumption that yields on the retired acreage were 10 percent less than the district average. Under criterion #1, a total of around 12 million acres would be eligible for participation in the program. Related fallow acres would add another 5 million acres to the total. Under criterion #2, a much smaller proportion of all wheat land would be eligible and for this reason both the cost and the effect on production would be less.

The adjustment in production based on criterion #1, assuming yields on targeted acres were 90 percent of the district average, would be around 290 million bushels. The annual public cost (assuming no tenant or fallow compensation) would amount to about $270 million which means that the cost per bushel of retired production would average just under a dollar.

Figure 6. Percentage of Harvested Wheat Acres Eligible for Participation in a Long Range Conservation Reserve Program Based on Soil Loss Equations (Criterion #1) and Land Capability Classes (Criterion #2)*



Key:

Criterion #1/Criterion #2

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* The first figure in each district is the proportion of wheat acreage eligible for the program based on an estimate of combined losses due to water and wind erosion (USLE + WLE); the second figure is the proportion of eligible wheat acreage based on SCS Land Capability Classes IVe, VIe, VII, and VIII.

Table 8. Program Size and Program Cost of Two Alternative Criteria for Retiring Land

Program Characteristics Size and Cost	Criteria for Retiring Land* Soil Loss Equations (#1)*	Land Class (#2)**
Eligible land (percent of total acreage)		
Wheat Acres	21.5	14.0
Related Fallow Land	28.0	18.6
Acreage retired (million acres)		
Wheat Land	11.6	7.6
Related Fallow Land	5.2	3.4
Average annual cost*** (million dollars)		
1.0 x District Yield:	297	188
0.9 x District Yield:	267	170
Production adjustment (million bushels)		
1.0 x District Yield:	320	207
0.9 x District Yield:	288	186

* Eligibility for inclusion in the program is based on land with potential erosion exceeding 2-T; erosion rates are calculated using a combination of the universal soil loss and wind loss equations (USLE + WLE).

** Eligibility limited to land in SCS Capability Classes IVe, VIe, VII and VIII.

*** Annual program cost does not include compensation for related fallow land or payments to tenants.

Comparing Conservation and Least Cost Programs. A long range land retirement program targeted to achieve conservation objectives would cost slightly more per unit of reduced output than one based on retiring areas with the lowest land cost per bushel of wheat production. Assuming 11 million acres were retired (the area of land in the Great Plains with an estimated erosion rate exceeding the 2-T standard), land retirement costs per bushel of supply adjustment would be approximately 10 percent higher than for a least-cost supply adjustment program. While total costs are probably underestimated (owing to the omission of payments for fallow land), the comparative analysis suggests that the incremental cost of attempting to achieve dual objectives is not very high.

The effects within the region might be quite different, however. For example, under a least-cost program, up to 30 percent of the wheat land in western Montana might be idled, whereas under a targeted conservation program based on the 2-T criterion, only 5 percent of the wheat land in northwestern Montana would be idled. In contrast, up to 62 percent of the wheat land in southeastern Colorado might be retired from production based on the conservation criterion. This assumes that no limits would be imposed on retiring erodible land.

The foregoing analysis is based solely on wheat-related acres. It would be more realistic to assume that all erosive cropland would be eligible if a targeted conservation reserve program were introduced, not just that devoted to wheat. If so, costs would rise which could result in Congress imposing limits on either the size of the program or appropriations. Under such circumstances, targets for adjusting wheat production might not be achieved.

Factors Limiting the Analysis

Crop Reporting Districts as Units of Observation. NASS crop reporting districts are the smallest units for which data on yields and rental rates are available. For acreage and cost calculations, it was assumed that land quality and rental rates were uniform within districts at the average rate. Districts were then ranked on the basis of lowest average land cost per unit of output. A fixed proportion (30 percent) of land in each of the lowest-cost districts was assumed to enter the program.

The use of average district data is an obvious limitation because not all land in a district is of the same quality; rental rates also vary within districts. Undoubtedly there is some high-cost land and some low-cost land in every district. In practice, some land from every district would enter the program, whereas the analysis is based on the assumption that only land from the

lower cost districts is retired. Hence, the geographic distribution of retired land is likely to differ somewhat from that suggested by this analysis. One would expect more accurate results concerning the geographic distribution of retired land if data were available for units, such as counties, that are smaller than crop reporting districts.

Fixed Proportion of District Acres Retired. The geographic distribution of idle land also might differ in practice because the foregoing analysis assumes that a fixed proportion of land enters the program from each district. In the semi-arid regions of the Great Plains, wheat production is more risky and there is more marginal land. By assuming the same proportion of land enters the program from all low-ranked districts, participation may be underestimated for the semi-arid regions and overestimated for more favored regions. Restrictions on the acreage that can be retired from a local area would limit the underestimation problem. To the extent that underestimation exists, costs would also be affected because rental rates are lower in the semi-arid regions.

Estimates of Cash Rents to Represent Land Rental Rates. Another important assumption is that NASS estimates of cash rental rates are representative of actual land rental rates. It appears that for many districts the NASS estimates are lower than prevailing rates based on share rental arrangements. This could bias estimates of program costs downward, although the bias from using cash rental rates probably does not exceed 10 percent.

Kansas Crop Budgets to Represent Program Impacts. Crop budgets from only two areas in Kansas were used to estimate the differential impacts on landlords, tenants and owner-operators, and only one of them was reported because results were similar. Costs and returns may differ for other areas; however, the conclusion that tenants would be affected differently from landowners and owner-operators by changes in annual program provisions is unlikely to be invalidated by further analysis.

Step Functions to Compare Costs of Bid and Offer Systems. Estimated cost differentials between a bid and a flat rate offer system also need to be qualified. The program supply curves (e.g. Figure 1) are step functions. Estimated program costs under a flat rate system are sensitive to the vertical height of the steps. For a flat rate system, the cost per bushel needed to bring the last targeted acre into the program determines the cost of every acre brought into the program. Because steps at the extremes of the program supply curve are higher than at the mean, differences in costs between a bid and a flat rate system depend on the target level of adjustment to be achieved. Marginal changes in program size may cause large changes in relative costs of the two systems.

Levels of Non-Land Compensation. The level of non-land compensation needed to attract participation in a long range program depends on many institutional factors including annual commodity program provisions and equity for tenants. An annual land payment equal to prevailing cash rents plus a one-time payment of twice the annual land payment were assumed to be sufficient to attract the desired level of program participation as well as to compensate adequately tenants or participating owner-operators. True program costs may be higher or lower depending on the validity of these assumptions.

Conclusions

1. Benefits under annual commodity programs will have to be reduced before large numbers of owner-operators would elect to participate in the proposed long-range program.

One of the major deterrents to successful implementation of a low-cost, long-range land retirement scheme is the current deficiency payment program which encourages farmers to continue producing wheat in order to qualify for the substantial benefits now offered. Annual commodity programs will have to be modified if large numbers of owner-operators are to be induced to participate in the proposed long range program. Under the proposed program, landowners receive program land payments equivalent to land rental rates and operators (tenants or owner-operators) receive a one-time payment of twice the annual program land payment.[11]

Returns from participating in annual set-aside programs in recent years have exceeded substantially what farmers could earn by renting out their land. A long-range program providing payments to landowners equivalent to what they can receive by renting out their land would appeal mainly to non-operator landlords and to owner-operators who want to retire or restructure their farming operations.

A substantial reduction in the target price for wheat (assuming the 1986 loan rate is retained) would tip the scales in favor of participation in the proposed long range program. If land diversion and deficiency payments were eliminated entirely and the average market price for wheat remained below $3 per bushel, substantial numbers of farm operators would find it advantageous to rent land to the government under the proposed ten year contracts.

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[11] The proposed program is more generous than considered in a U.S. Department of Agriculture study that assumed only land rent would be paid [U.S.D.A., 1985].

An alternative to reducing annual commodity program benefits is to offer farmers payments higher than those under the proposed program. This, of course, would raise the cost of meeting whatever adjustment targets might be established. Potential cost savings associated with a long-range program probably cannot be achieved without some modification of existing support programs.

2. The availability of a long-range land retirement program will not solve the financial problems of those heavily in debt but might help those with less serious debt who quit farming. Reducing annual program benefits would increase the problems of those facing financial stress.

Many farmers with the most serious financial problems have land debt higher than can be supported by current returns to land. Benefits under the proposed program (which average only 20 percent higher than land rent over the ten year life of the program) would not be sufficient to solve these farmers' problems.

The program might help those owner-operators with less serious financial difficulties who have the opportunity to sell their equipment and work off the farm. Because the proposed program offers a one-time adjustment payment (i.e. tenant compensation), farmers who placed their land in the proposed program would be better off than those who rented their land to other farmers.[12]

The financial problems of farmers would increase if implementation of a long-range program were accompanied by a reduction in annual program benefits. Reducing the level of deficiency payments would place further stress on net farm incomes and might result in still lower land values.

3. A long-range land retirement program designed to retire wheat land in the Great Plains at minimum cost is not likely to have a major impact on soil losses.

Erosion on much of the land now planted to wheat is modest and not all of the land subject to severe erosion would be offered for rent under a voluntary land retirement scheme. If instead of seeking to rent land at least cost, the program were designed to retire vulnerable crop land, costs would rise, and

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[12] Obviously, those who are forced to sell or forfeit their land would not have this opportunity. A program might allow institutions such as the Farmers Home Administration to enter land in the program. Tenant compensation payments could then be paid to the previous owners or operators, thereby easing the transition. Such institutional participation might also help prop up land values by withdrawing some land from the market.

production adjustments would be less for a given expenditure of public funds. The marginal cost of incorporating conservation objectives may not be very high, but the regional impact of a targeted conservation program would differ substantially from that aimed at achieving supply adjustments at minimum cost.

4. It will be difficult to design a long-range land retirement scheme in such a way as to avoid creating inequities between regions and tenure groups.

The regional impact of taking land out of production under voluntary contracts can, of course, be minimized by restricting the acreage idled to a given percentage of the cropland in each county. But inevitably there will be different effects on owner-operators, tenants and landlords.

Landlords are more likely to participate than owner-operators, thus creating fewer opportunities for those seeking to rent land. Potential losses to tenants can be reduced by incorporating provisions for tenant compensation and restricting the amount of rented land entering the program from each district. Even with payment of tenant compensation, at 1986 and 1987 annual program support levels, many tenants would suffer losses under the proposed long-range program unless they could find other land to rent. Inequities could be avoided but only at the cost of increasing tenant compensation.

5. Cost reductions that in theory might be achieved by shifting from an annual to a longer-range land retirement program may be difficult to realize given political pressures on Congress and USDA administrators.

In designing or modifying future long-run supply management programs, policy makers will be under pressure to distribute benefits widely, minimize program impact on local businesses, and permit marginal land to qualify for payments. This will make it difficult to achieve the cost savings theoretically attainable by retiring more land under long-term contracts.

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APPENDIX A

Total Program Cost and Per Acre Costs of a 7.7 Million Acre Program Under Alternative Assumptions Regarding Acreage Restrictions, Fallow and Tenant Compensation*

Average Annual Program Cost		Production Adjustment	Percent of District Acres Retired**	25% Fallow Compensation	Tenant Compensation
Total	Per Acre				
(mil.$)	($/A)	(mil. bu.)			
148	19.16	222	100	no	no
170	22.04	232	50	no	no
177	22.99	222	100	no	yes
178	23.11	225	100	yes	no
181	23.51	227	30	no	no
183	23.71	218	50	yes	no
204	26.45	232	50	no	yes
207	26.85	230	30	yes	no
214	27.73	225	100	yes	yes
217	28.21	227	30	no	yes
219	28.45	218	50	yes	yes
248	32.22	230	30	yes	yes

* Total program cost excludes costs of establishing and maintaining cover crops and administrative costs.

** Percentage of wheat acreage by cropping practice assumed retired from each district entering the program.