COMPARATIVE EFFICIENCY OF SELECTED VOLUNTARY CONTROL PROGRAMS IN THE USE OF GOVERNMENT FUNDS

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Submitted to the Faculty of the Graduate College
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in partial fulfillment of the requirements
for the Degree of
DOCTOR OF PHILOSOPHY
May, 1971

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PREFACE

A large portion of the analyses of farm programs has heretofore been conducted by means of a theoretical analysis. Few programs have been analyzed on the basis of how farmers have actually participated or on the basis of their stated payment requirements. A comparison of the results based on theoretical analysis and farmers' stated payment requirements using the same programs and the same group of farms is rarer still.

This study is composed of two parts. The first part is concerned with a theoretical analysis of alternative farm programs. The second part deals with an analysis of the same programs using the stated payment requirements of farmers. The two analyses are compared and contrasted. It is hoped that sufficient generalizations have been drawn from the 12 programs studied to aid in the evaluation of many additional program alternatives.

Special acknowledgment is due to Dr. Luther G. Tweeten for his guidance and encouragement as chairman of my graduate advisory committee. Special appreciation is also expressed to Dr. Leo Strickland for valuable assistance given in his dual role as member of the advisory committee and also as my immediate supervisor during my assignment by the Economic Research Service in Stillwater. I wish to express my appreciation to Dr. Carl Marshall who served on the advisory committee during the formative stages of the study and to Dr. Leroy Folks who joined the committee upon the retirement of Dr. Marshall.

Indebtedness is acknowledged to the Farm Production Economics Division, Economic Research Service of the U. S. Department of Agriculture for the financial support which made this study and the remainder of my graduate study possible. Special acknowledgment is due James Vermeer for his many helpful comments throughout the course of the study.

A note of thanks is given to a small, but dedicated, band who helped in the many stages of data analysis and manuscript analysis. Particular reference is made to Mrs. Ida Rose and Mrs. Linda Hunter. In addition, I wish to thank Mrs. Linda Dalton for the excellence of the final copy.

CHAPTER I

INTRODUCTION

Despite the rapid urbanization and industrialization of the United States as it enters the 1970's, farm policy is an issue in which every citizen has at least some stake. Farm policy is of concern to the farmer because it affects his very livelihood; it is of concern to the businessman because it affects his profit and loss statement; it is of concern to the consumer because it affects the costs of what he wears and eats; and it is of concern to the taxpayer as he looks for ways to reduce Government costs.

After three and a half decades of extensive Government supply control programs, agriculture still has the capacity to overproduce and is still faced with painful and costly adjustments in resource use. Federal expenditures for supply control and income maintenance amount to over three billion dollars annually. There is an additional social cost resulting from the overcommitment of sources to farm production.

In 1966, nearly 63 million acres of cropland were diverted from production under Government agricultural programs. It has been estimated that if the present control programs ended, 40 to 50 million acres of this land would return to production of crops presently being controlled. In addition there are up to 300 million additional acres of potential cropland that could be brought into production, if it were not for present acreage restrictions and if commodity prices were

favorable.[1] It has also been estimated that diverted cropland has an average productivity per acre between 85 to 90 percent of that cropland actually used for the production of wheat and grain sorghum.[2]

One alternative is to terminate Government supply control programs and allow resource adjustments to take place under free market conditions. One set of estimates are that without Government programs, prices received by farmers in the short run would be ten to 20 percent lower, gross receipts would be five to 15 percent less and net farm income would fall by 25 to 50 percent.[3] One set of specific estimates for wheat indicate a long term free market price of $1.22 per bushel, compared with a 1961-65 average price of $1.67. Grain sorghum would fall to $0.84 per bushel from $1.00. Net farm income would stabilize at a level of 11.3 billion dollars from a 1961-65 average of 13.2 billion dollars.[4]

The other alternative of continuing Government control programs (primarily land diversion) also implies a continuing high Treasury cost. Pressures to reduce, or at least not raise, the cost of farm programs are great. Mandatory control programs minimize Government costs and can maintain farm income. In general, farmers have, however, objected to mandatory control programs because of restrictions on production and marketing decisions. Consequently, production control in agriculture are now for the most part obtained by voluntary programs.

The number of possible voluntary programs is large, and they are not equally efficient in use of public funds to reduce production and raise farm income. An important question is "What voluntary control programs are most efficient in use of Government funds?"

An index of cost effectiveness or theoretical efficiency of programs is

$$E = \frac{1}{1 - \frac{C}{PY}} \qquad \begin{matrix} 1 < E < \infty \\ C < PY \end{matrix}$$

where E is the value of production removed per program dollar spent, C is variable costs per acre, P is product price, and Y is yield.[5] It is apparent that as variable costs approach the gross value of production, efficiency becomes large and approaches infinity. E becomes larger (the ratio C/PY becomes larger and approaches one) as land becomes more marginal in quality (lower Y), as product prices fall (lower P) and as variable costs become larger (higher C). On the best land, costs become small relative to returns, hence C/PY approaches zero and E approaches one.

A greater proportion of costs become variable costs when the time period is extended and when whole farms are retired, so that labor and machinery assets become variable costs. Thus, the theoretical efficiency of voluntary land retirement programs is highest with long-term, whole-farm programs that are concentrated on land of marginal quality.

Objectives

A need exists to determine the actual, as well as the theoretic, efficiency of alternate production withdrawal programs. Specifically, this study has the following major objectives:

1. To determine the theoretical efficiency of part and whole farm participation, with and without grazing, in various voluntary land withdrawal programs which include:

(a) Short-run acreage diversion orientated to wheat and feed grains.

(b) Long-term land retirement of ten-year duration.

(c) Land purchases by Government.

(d) Nonrecourse loans to remove land from production and for an unspecified period of years.

2. To estimate the efficiency of the above programs on the basis of the payment which farmers state they would require to participate.

3. To analyze some of the factors that determine participation in Government programs and the reasons for the difference between theoretical and actual participation.

Results of this study are intended to provide policymakers with guidelines useful in constructing a cost-effective supply control program for agriculture. The various programs will be ranked according to their computed or theoretical efficiency and ranked again according to the efficiency calculated from the responses given by the farmers interviewed. Results given by the two types of analyses will be compared and contrasted in an effort to determine better a priori methods of program evaluation. Knowledge of how farmers think and act in regard to farm programs should help those who design programs in selecting those provisions which are most acceptable to farmers.

Previous Studies

Previous studies on the subject of farm programs can be divided into two types. One type begins with the assumption that a farmer will retire a given category of cropland whenever the payment offered is

greater than his expected return over variable costs. The procedure is then to divide the cropland areas of the United States into numerous homogeneous units and to develop crop budgets for each unit. The cropland within each unit is then arrayed on a scale from the lowest return over variable costs to the highest profit acreage. It is then a simple matter to calculate the number of acres that theoretically would be retired for a given payment or to calculate the amount of money that would be required to retire a specified acreage. This first type of study is similar to the first objective of this study which provides for calculation of the theoretical efficiency of various programs.

In one such theoretical study, three programs were compared. A retirement program including only whole farms with grazing of retired land prohibited gave the best theoretic average efficiency -- a $2.85 reduction in crop production per dollar of program cost. When partial farm diversion and grazing was permitted, the theoretical efficiency fell to $2.04 per dollar of cost. If grazing was not allowed on the partial farm diversion program the efficiency ratio was $1.80 per dollar.[6]

The second type of research study has focused on what farmers have done under actual program situations. Since the variety of programs offered in the past has been quite large, these studies offer a valuable "check" on the theoretical studies. The second objective of this study lies between the theoretical and the actual in that it relates to what farmers <u>say</u> they would do when faced with a hypothetical program choice.

Short-term or yearly diversion programs are considered theoretically to have the lowest efficiency. A study of the Acreage Reserve

Program during the period 1956-58 showed a return of $1.70 in crop output reduction for each dollar payment.[7] The 1961 Feed Grain Program also involved yearly diversion. In a study of participants in the North Central Plains, it was found that corn production was reduced by $1.14 for each dollar of program payment.[8]

In a study by Christensen and Aines of longer term land retirement programs, with a theoretically higher efficiency, the Conservation Reserve between 1957 and 1960 diverted $2.92 in crop production per dollar of payment. The long-term Cropland Conversion Program in the period 1964-65 had an average output reduction by counties ranging from $0.67 to $3.87 per dollar of cost.[9]

Several studies have attacked the question of why some farmers participate in programs when others do not. This question relates to the third objective of this study concerning the gap between the theoretically indicated program response and what farmers say they would do.

When participants and nonparticipants in the Feed Grain Program in Minnesota were statistically compared, it was found that participants had more cropland and fewer livestock per acre than did nonparticipants.[10] There was no significant difference between participants and nonparticipants in factors such as age, off-farm employment or expected prices. A study of the 1961 Feed Grain Program and the Conservation Reserve Program in the North Central Plains also found that larger farms were more likely than small farms to participate in programs. The same study could find no correlation between farmers' attitudes toward government farm policy or programs and their participation in the same.[11] Another study of the 1962 Feed Grain Program in the Corn

Belt found the significant factors associated with participants to be a crop-share rent-tenure situation, a high ratio of crop sales to livestock sales and large farm size measured in cropland or crop bases. There were no differences in crop yields.[12]

When farmers were asked directly why they participated in control programs, in addition to the profit associated with the payment, they gave such reasons as: (a) to improve the land, (b) to help reduce surpluses, (c) to reduce risk, and (d) to reduce costs.[13] Reasons given by farmers to App and Sundquist for not participating in programs, other than an unprofitable payment level, included the need for feed for livestock and inequities in program payment rates among farmers.

Outline of Following Chapters

The order of presentation for the remainder of this dissertation is as follows:

Chapter II - describes the sampling procedure, interview technique and methods of data analysis.

Chapter III - presents the calculation of the theoretical efficiency of the alternative program.

Chapter IV - estimates the efficiency of the various programs on the basis of farmers' actual response.

Chapter V - analyzes the gap between the theoretical and actual efficiency estimates.

Chapter VI - summarizes the results of the study and presents the conclusion and their implications.

FOOTNOTES

[1]James Vermeer and Rudie W. Slaughter, Jr., Analysis of a General Cropland Retirement Program, ERS Bulletin 377 (Washington, 1968), pp. 13-14.

[2]P. Weisgerber, Productivity of Diverted Cropland, ERS Bulletin 398 (Washington, 1969), p. 14.

[3]Luther G. Tweeten, Commodity Programs for Agriculture, National Advisory Commission on Food and Fiber (Washington, 1966), pp. 10-11.

[4]Leo V. Mayer, Earl O. Heady and Howard C. Madsen, Farm Programs for the 1970's, Center for Agricultural and Economic Development Report 32 (Ames, Iowa, 1968), pp. 31-34.

[5]Fred D. Sobering and Luther G. Tweeten, "A Simplified Approach to Adjustment Analysis Applied to Wheat Producing Areas in Western States," Journal of Farm Economics, Vol. 46 (1964), pp. 820-834.

[6]J. Carroll Bottum, et.al., Land Retirement and Farm Policy, Indiana Agricultural Experiment Station Bulletin 704 (Lafayette, 1961).

[7]Raymond P. Christensen and Ronald D. Aines, Economic Effects of Acreage Control Programs in the 1950's, USDA (Washington, 1962).

[8]Geoffrey Shepherd, et.al., Controlling Inputs, Missouri Agricultural Experiment Station Bulletin B-798 (Columbia, 1963).

[9]James Vermeer, The 1964-65 Cropland Conversion Program, USDA (Washington, 1967).

[10]J. L. App and B. Sundquist, The Feed Grain Program in Minnesota, Minnesota Agricultural Experiment Station Bulletin 464 (St. Paul, 1963).

[11]John Squibb and Jerry G. West, Participation in Government Land Retirement Programs in Missouri, Missouri Agricultural Experiment Station Bulletin SB-803 (Columbia, 1963).

[12]James Vermeer, Profitability of Participation in the 1962 Feed Grain Program in the Corn Belt, Economic Research Bulletin No. 362 (Washington, 1964).

[13]James Vermeer, An Economic Appraisal of the 1961 Feed Grain Program, USDA (Washington, 1963).

CHAPTER II

SURVEY PROCEDURE

Oklahoma has been divided into subregions for the purpose of analyzing crop resource requirements, costs and returns. These subregions are unique multicounty areas, delineated in such a manner that the area within each is fairly homogeneous with respect to soils, climate and cropping practices. There are alternative crop budgets prepared periodically for each subregion and published as a processed series bulletin of the Oklahoma Agricultural Experiment Station.

Four of these subregions, making up the western half of the state, were chosen as sample areas for this study. Figure 1 shows the boundaries of each subregion used -- the Panhandle, northwest Oklahoma, northcentral Oklahoma, and southwest Oklahoma. These four regions alone account for over 90 percent of the wheat production and over 75 percent of the grain sorghum production in Oklahoma.[1]

Sampling Procedure

One county was randomly selected from each of the four subregions described above. The sample contained a diversity of rainfall, soil types, competing farm enterprises, tenure arrangements, and availability of off-farm work such as is found in other commercial wheat and feed grain production areas of the state. Figure 1 shows the four sample

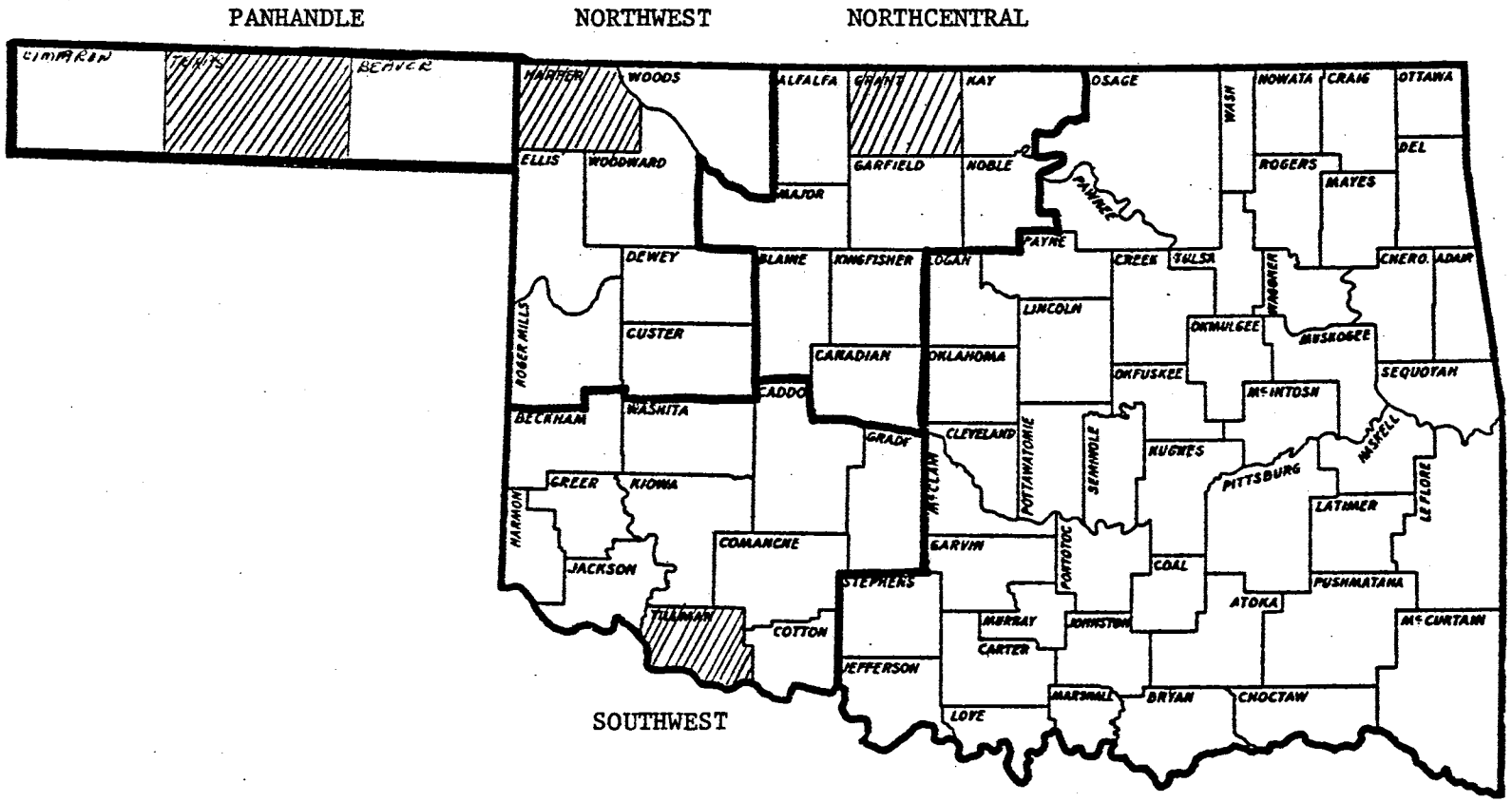

Figure 1. The Four Production Subregions and Four Counties from Which the Sample was Drawn

counties in which farmers were interviewed -- Texas, Harper, Grant, and Tillman.

Budgetary limitations restricted the number of personal interviews to approximately 200 dryland farm operators. The 200 potential interviews were divided among the four counties on the basis of the number of nonirrigated farms with harvested cropland as given by the 1964 Census of Agriculture.

The sample was stratified between present program participants and nonparticipants within each county by the percentage of the county's eligible farmers that participated in the 1967 Feed Grain Program. The present program participation varied from a low of 67 percent in the Texas County population to a high of 76 percent in the Tillman County population. Table I shows how the intended total county samples were divided between program participants and nonparticipants.

TABLE I

SAMPLE DISTRIBUTION AMONG COUNTIES AND PARTICIPATION CATEGORIES

	Intended Sample		Usable Schedules	
County	Participants	Non-participants	Participants	Non-participants
Grant	58	20	39	34
Harper	21	8	23	10
Texas	29	14	39	6
Tillman	38	12	42	5
Total	146	54	143	55

After the number of program participants and nonparticipants required for each county sample was determined, the names of farm owner-operators or farm operators were randomly drawn from the appropriate lists in each county ASCS office. To allow for interviewee refusals, those who had died or moved and other contingencies, a replacement list was drawn in each county equal in size to 25 percent of the original sample. Table I shows the number of usable dryland questionnaires that were completed in each.

Questionnaire Design and Data Gathering

The collection of sufficient information to allow the analyses outlined in the objectives resulted in a lengthy and difficult questionnaire. In addition, it was necessary to resolve the differences in the way data were organized in the county ASCS records and in the farmers' minds. The result was a 13 page questionnaire in two parts, with separate columns in the appropriate places for each individual ASCS farm under the control of the respondent.

To take the entire questionnaire by personal interview would have involved a visit of more than two hours per farmer. There were also some questions that the farmer might need time to consider before answering. For these reasons, the first four pages of the questionnaire were mailed to the operator along with a cover letter explaining the purpose of the study (see letter in Appendix A). The respondent was asked to fill out Part I on his own. Part I of the questionnaire is reproduced in Appendix A.

Shortly after the respondent received the first part of the questionnaire, the interviewer called and arranged an appointment to

complete Part II. At the time of the visit, Part I was checked for completeness and accuracy. Before the interview took place, all information required on the first page of Part II was obtained from the county ASCS files. This insured that the interviewer had the identifications and sizes of all farms, allotments and bases under the control of the operator before the interview took place. Part II of the questionnaire is displayed in Appendix A.

The interviews took place first in Grant and Harper counties beginning the fall of 1967, and concluded in Texas and Tillman counties in the early summer of 1968. A total of four interviewers were used, but over 75 percent of the total usable schedulates were completed by the author and one other interviewer.

Refusals and Biases

Schedules were completed on 79 percent of the names drawn in the sample. Percentages of completion for counties were: Grant, 75; Tillman, 75; Texas, 83; Harper, 92. The lower percentage of completion in Grant County was partly due to a considerable time lag that unavoidably developed between the mailing of the first part of the questionnaire and the time the interview was scheduled. Grant was also the first county surveyed, and the interviewers were still inexperienced. In Tillman County, the time of the interviewing, early summer, was a busy season for farmers.

A little over half of the noncompletions in each county were outright refusals by the farmer to cooperate. The remainder was due to sickness, death, quit farming, moved from county or other reasons.

It is difficult to estimate the characteristics and preferences of farmers who could not be interviewed. The results of the study may be biased slightly toward farmers who prefer Government programs. The small number of refusals was unlikely to affect significantly the conclusions of the study.

Profile of Sample

Table II presents data which describe the farms and farmers in each county. These data were summarized from information obtained from farmers interviewed.

TABLE II

DATA DESCRIPTIVE OF FARMS AND FARMERS IN SURVEY

Item	Grant	Harper	Texas	Tillman
Farmers interviewed	73	33	45	47
Average age	49.4	51.5	51.8	51.5
Average years of school	12.0	10.5	11.4	11.4
Average acres cropland	399	653	650	420
Average acres wheat allotment	279	430	390	221
Average acres feed grain base	29	87	110	28
Farm full time (percent)	79.5	84.8	75.0	72.4
Percent Farm Bureau member	45.2	57.6	33.3	25.9
Percent Farmers Union member	11.0	9.1	6.7	34.0

In subsequent chapters, various programs to control production will be compared at various levels of land diversion or value of production removed. For this reason Table III sets forth the land use pattern of the sample of 421 farm units as well as the allotments, bases and projected yields. The data in the first column are for the total sample. The second column gives average data per ASCS farm unit.

TABLE III

CROP AND LAND DATA FOR FARMS IN SURVEY

Item	Total of All Farms	Average Per Farm
Number of ASCS farms	421	1
Number of managerial units	197	
Use of land in 1967, acres		
Sorghum grain	4,627	11.0
Sorghum forage	2,645	6.3
Wheat	57,322	136.2
Barley	2,290	5.4
Hay and pasture	7,192	17.1
Cotton	2,090	5.0
Fallow	22,523	53.5
Total cropland	98,689	234.4
Allotments and bases in 1967, acres		
Feed grain	11,300	26.8
Wheat	61,620	146.4
Barley, oats, rye	6,366	15.1
Cotton	3,017	7.2
Projected yields in 1967		
Sorghum, bu.		32.1
Wheat, bu.		22.5
Cotton, lbs.		274
Total value production, dollars		
Wheat at $2.00 per bu.	3,520,523	8,362
Wheat at $1.25 per bu.	2,550,854	6,059

FOOTNOTES

[1]Oklahoma State Board of Agriculture, Annual Report for 1966 (Oklahoma City, 1966), pp. S32-S39.

CHAPTER III

THEORETICAL EFFICIENCY

The key assumption in the calculation of theoretical efficiencies for various program alternatives is that the farmer will respond the way he "should". That is to say he will take part in a program whenever the payment received equals or exceeds the profit foregone. Behind this assumption lie the supporting assumptions of perfect knowledge, rationality, profit maximization, and flexibility. Without an objective method of specifying these assumptions, it is necessary to proceed as if each unit of land, allotment or base will be retired or diverted whenever the program payment is as large as the return over variable costs from using the unit in the usual manner.

The concept described in the preceding paragraph is embodied in an index of the value of production removed per program dollar spent:

$$E = \frac{1}{1 - \frac{C}{PY}}$$

where E is an efficiency index between one and infinity, C is the sum of variable costs per acre, P is product price and Y is yield.[1]

Variable Costs

The cost element of the index is subject to variation from a number of sources. As the time period of the program increases, the

farmer is able to sell or not replace some productive assets, such as owned machinery and regularly hired labor, thus converting these expenses from fixed to variable. By the same process whole farm retirement increases the proportion of variable costs while reducing fixed costs, when compared with programs that retire only part of a farm's crop acreage. The agronomic quality of the land itself can affect the variable cost of production and particularly the ratio of costs to returns. Thus on land of marginal quality the C/PY ratio becomes larger.

For each program analyzed theoretically, it is necessary to carefully define the items included as variable costs. For all programs the following costs are considered to be variable: chemicals, fertilizer, seed, hired machinery, and machinery operating expenses (repairs and fuel). As the time span of the program is extended from one year to tenyears, machinery ownership costs (depreciation and interest) are included as variable. For analysis of cropland easements, all labor costs are added to the variable component. In the case of the cropland purchase program it is logical to add landownership costs (taxes and interest) to variable costs. In practice this gives a total variable cost that nearly equals the value of crop production when wheat is priced at $2.00 per bushel, and which exceeds crop receipts with wheat at $1.25. For this reason the efficiency index given above is not used for the theoretical analysis of land purchase by the Government. In this case the land is priced at the prevailing level for its type and location. An annual cost of Government ownership, based on this price, is then calculated using a six and one half percent interest rate.

The cost data are derived from two sources. Each farmer interviewed estimated the yearly variable costs of producing wheat, grain sorghum, and pasture for his farm. Machinery ownership costs, labor costs, and costs for crops other than wheat, grain sorghum, and pasture were obtained from budgets prepared by the Oklahoma Experiment Station and the USDA for the areas sampled. Land ownership costs (taxes and interest) were calculated at seven and one half percent of the prevailing market value for the land.[2]

Yields

Yields also are an important variable in the efficiency index. They vary between farms as the quality of the soil, climate, and managerial ability vary. They also vary within a farm due to soil differences. The soil on each farm sampled was classified into from one to three quality categories. The farmer placed a normal yield for wheat, grain sorghum, and pasture on each category. The yields of other crops were obtained from the same publications used for the cost data. For analytical purposes it was assumed that high value crops, such as cotton, wheat, and grain sorghum were grown on the better quality land. Non-controlled crops, hay, pasture, diverted, and idle land were assumed to be on the least productive land.

Prices

Prices were fixed at one assumed value with the exception of wheat. On most questions the farmer was instructed to assume a wheat price of either $2.00 per bushel or $1.25 per bushel or to answer for both prices. Other prices were assumed to be: $8.00 per animal unit

month for hay and pasture, $1.12 per bushel for grain sorghum, $18.00 per ton for sorghum forage hay, $7.00 per ton for sorghum forage silage, $0.88 per bushel for barley, and 18.4 cents per pound for cotton. In all cases fallow land is given a zero value in calculating the value of crop production.

Program Alternatives

The alternative programs were selected to give a wide range of time periods. The diversion period ranged from one year to infinity in the case of Government land purchase. The programs also ranged from part farm situations, such as wheat allotments only, feed grain bases only or poorest land only, through to whole farm retirement. The ten-year, part-farm retirement program was studied with and without grazing. All other programs exclude the grazing privilege.

For each program alternative the following analytical procedure was used. The theoretical efficiency, value of the production removed per dollar of program cost, was calculated for each eligible farm in each program. Next farms were ranked from high to low on the basis of this theoretical efficiency within each of the study counties. Farms were added to the ranked but until 30 percent of the total cropland acreage for each county sample was reached. The 30 percent of the farms which could be retired most efficiently in each county were then merged into a master list for the entire study area which also was ranked on a high to low efficiency basis. Farms were then taken in order from this master list and accumulated into land retirement levels of three percent increments.

This procedure implies that price discrimination was practiced, in that each farm was paid only the amount theoretically required to gain its participation in each program. The procedure also results in farms with the highest ratio of cost of production to value of production being retired by the program. Thus application of the cost-effectiveness principle of removing the most production per dollar of program cost is also consistent with economic efficiency (retiring marginal land) if farm income is to be supported by land retirement.

Government Purchase of All Cropland

The total cost of USDA programs to stabilize farm prices and income from 1933 to 1968 has been over $40 billion. For less than half this expenditure the Government could have purchased 80 million acres at $225 per acre and leased it back for grazing or recreation. Would a land purchase program actually give a greater reduction of output per dollar of program cost than nonpurchase type programs? To answer this question the study included an option to purchase whole farms and an alternate option of purchasing only the poorest land on each farm.

As mentioned previously the assumed efficiency index, $E = \frac{1}{1 - \frac{C}{PY}}$ could not be used in the evaluation of this program. When land ownership costs were included in the C/PY ratio, costs exceeded returns on 28 percent of the farms. An alternative procedure was devised. The purchase price for all cropland on each farm was set at the prevailing market price for farms of similar quality and location. This cost was determined early in the questionnaire and is different from the farmers' asking price for actually selling his cropland to the Government, as used in the next chapter. It was then assumed that the Government

would experience an annual cost of six and one half percent of purchase cost for interest on investment.

In computing the efficiency ratio for the purchase of cropland, the value of crop production was determined using alternative wheat prices of $2.00 and $1.25 per bushel. With $2.00 wheat, 35 out of 421 farms had net returns to land less than six and one-half percent of the purchase price. Thus it would not be "profitable" for the Government to purchase these 8,204 acres. At $1.25 wheat, 44 farms comprising 10,841 acres were "unprofitable". Theoretically these farms were also unprofitable to the present owners in their present use.

Table IV depicts the effect of removing increasing acreages through Government purchase of all cropland on sample farms. Efficiencies are quite high, particularly at lower retirement levels. The size and value of production for farms included in the three percent level are considerably less than the sample averages. Above the three percent level farms tend to be slightly smaller than the sample average in acreage, but slightly larger than average in value of production.

Appendix B contains supplemental data for each program type by retirement level. These appendix data consist largely of crop acreages showing specific land use, as well as allotments, bases, and projected yields. The effect of the 30 percent limitations on land retired per county can be readily seen in the cotton acreage column of Table XXXI. Cotton acreage increases rapidly from the three percent to the 12 percent levels and then stabilizes when the limit for Tillman County -- the only county in the sample -- is reached. The projected yield data do not indicate any trend in sorghum or cotton yields from the lowest to the highest retirement levels. There is however a distinct tendency

TABLE IV

THEORETICAL RANKING OF GOVERNMENT PURCHASE OF ALL CROPLAND
BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Land Cost	Annual Ownership Cost	Production Retired Per Dollar of Cost
			Wheat $2.00				
3	3,042	18	$ 124,076	3.5	$ 335,458	$ 21,805	$5.69
6	6,032	28	255,631	7.3	750,685	48,795	5.24
9	8,901	40	391,939	11.1	1,236,415	80,367	4.88
12	12,006	59	541,717	15.4	1,807,679	117,499	4.61
15	14,780	73	696,110	19.8	2,429,232	157,900	4.41
18	17,649	84	842,045	23.9	3,061,832	199,019	4.23
21	21,308	94	1,010,400	28.7	3,850,143	250,259	4.04
24	23,717	108	1,122,738	31.9	4,399,899	285,993	3.93
			Wheat $1.25				
3	2,706	17	91,170	3.6	334,740	21,758	4.19
6	5,888	32	185,771	7.3	761,637	49,506	3.75
9	8,834	42	280,428	11.0	1,216,398	79,066	3.55
12	11,896	61	394,099	15.4	1,815,502	118,008	3.34
15	14,766	76	499,964	19.6	2,426,761	157,739	3.17
18	18,223	90	614,854	24.1	3,156,691	205,185	3.00
21	20,782	98	690,711	27.1	3,677,751	239,054	2.89
24	23,684	111	789,180	30.9	4,380,008	284,701	2.77

for farms in the lowest retirement levels to have lower wheat yields. At all retirement levels studied the percentage of land retired was less than the percentage of production retired. This indicates that the analytical techniques for maximizing program efficiency has resulted in the selection of farms of higher than average production per acre. Stated in another manner it appears the "good" farms are underpriced relative to "poor" farms.

There are some differences between farms drawn into the program when wheat is supported at $1.25 per bushel rather than $2.00. At the lower wheat support price the farms on which the program could be more efficient tended to be smaller in total cropland acreage, but higher in the acreage of grain sorghum and forage sorghum. Farms with a high percentage of land in wheat experienced a considerable lowering in total value of production when wheat was supported at $1.25. This caused predominantly wheat farms to have a much lower efficiency value of production removed per dollar of program cost.

Government Purchase of Poorest Cropland

Contrasted with a proposal that the Government offer to purchase the entire cropland unit of selected farms, an alternative was proposed wherein only the poorest segment of cropland on selected farms be purchased.

The purchase price for the poorest cropland category may not be as reliable as the whole farm data. The appraisals given by farmers were for "similar farms in your community" and were not broken down on a part-farm basis. The purchase price of the poor land segment of each farm was estimated by capitalizing the net return from this land, using

the same capitalization ratio that prevailed for all cropland. These price estimates for poor land, while seeming to be theoretically fair, were lower in comparison to the whole farm price than the ratio of poor land prices to whole farm prices given by farmers as their actual selling price.

Only 279 of the 421 farms sampled designated some land as poor. For these 279 farms the poorest land category averaged 59 acres, with a value of production of $873 when wheat was $2.00 and $714 when wheat was $1.25. Since on the average half of the poorest land was fallow acres, many farms had little or no production in this category. With wheat at $2.00, 7,532 acres on 150 farms did not have sufficient value of production to equal the annual cost of purchasing the poorest acreage. At $1.25 wheat the number of "unprofitable" poor land segments climbed to 175 and the acreage to 9,012. Because of this the purchase of poorest cropland, where advantageous to the Government, would only remove a maximum of between six and nine percent of the total cropland.

Tables V and XXXII give aggregate data for all farms which could enter the program on at least a dollar of production per dollar of annual ownership cost basis. At both prices for wheat, the first farms to enter the program -- at the three percent retirement level -- had a larger than average segment of poor land and had a higher proportion of their poor land in crop production. For example, the average sample farm had $873 in production from poor land with wheat at $2.00. The 37 farms in the three percent retirement level averaged $1,945 in crop production. In contrast with the program to purchase all cropland, the percentage of production removed with poor land retirement lagged behind the percentage of cropland retired at all levels. In general,

TABLE V

THEORETICAL RANKING OF GOVERNMENT PURCHASE OF POOREST CROPLAND
BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Land Cost	Annual Ownership Cost	Production Retired Per Dollar of Cost
				Wheat $2.00			
3	2,953	35	$ 88,900	2.5	$ 460,097	$ 29,906	$2.97
6	5,901	78	158,453	4.5	1,018,725	66,217	2.39
9	8,875	129	225,025	6.4	1,749,048	113,688	1.98
				Wheat $1.25			
3	2,960	37	71,983	2.8	473,649	30,787	2.34
6	5,893	84	130,761	5.1	1,116,003	72,540	1.80

the theoretical efficiencies computed for this program are about one-half those featuring the purchase of all cropland.

Cropping Easement on All Cropland

In an attempt to overcome widespread objection to Government purchase and ownership of cropland, a cropping easement program was presented. In this alternative the participant would receive a non-interest, non-recourse loan from the Government in exchange for the permanent cropping rights on his land. As long as the participant enjoyed the interest free use of the loan he could not crop the land in any way. He could repay the loan at any time and restore the cropping status of the land. In effect the participant's annual payment was the opportunity cost of the loan to him. The Government's annual cost was the cost of providing the loan (assumed for purposes of analysis) to be six and one half percent per annum. As no time limit was specified, the loan and program could continue in perpetuity at the discretion of the participant.

The theoretical efficiencies were computed using the standard formula described at the beginning of the chapter. All costs were considered variable except land ownership costs. There were 13 farms comprising 1,956 acres where variable costs exceeded value of production when wheat was priced at $2.00 per bushel. The number of unprofitable farms was 14 and the acreage 2,125 when wheat was priced at $1.25.

By the nature of the efficiency formula a negative theoretical efficiency is computed whenever costs exceed value of production. Since there are no returns over variable costs in these cases, it is impossible to compute a payment rate which might induce program

participation. If unprofitable farms were included as participants the production on these farms would be included in the value of production retired, but no appropriate program payment would be added to program costs. While their inclusion would increase program efficiencies modestly, there is no reason to believe that these farms would actually participate in a voluntary program. Therefore the procedure in this study has been to exclude from program participation these farms where variable costs exceed value of production.

Tables VI and XXXIII contain descriptive data of participants at each level of retirement. The assumption of a price of $1.25 for wheat automatically results in higher average efficiencies than the $2.00 program, because efficiencies become larger as the gap between expenses and value of production narrows.

The efficiency ratios hold up quite well over the entire range of retirement levels. Throughout, the percentage of production retired lags the percentage of cropland retired.

At the three percent level the farms participating at both prices averaged smaller in total acres and value of production than is true at the six percent level. At both levels the participating farms were considerably above the sample average in total acreage and fallow acreage and considerably below the sample average in value of production.

With wheat at $2.00, participants at lower retirement levels had wheat allotments that averaged about 30 percent of the total farm size. At lowest retirement level, with wheat at $1.25, wheat allotments averaged 55 percent of the total farm size compared with a sample average of 62 percent. There was little difference in feed grain bases when wheat prices varied, but the $2.00 wheat program drew almost all of the

available cotton farms from Tillman County into the program by the time nine percent of the land had been retired.

TABLE VI

THEORETICAL RANKING OF CROPPING EASEMENT ON ALL CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of all Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,736	11	$ 83,286	2.4	$ 59,751	$3.54
6	6,373	23	191,330	5.4	128,456	3.04
9	8,802	34	281,404	8.0	180,800	2.80
12	11,940	47	362,844	10.3	224,690	2.63
15	14,886	60	467,535	13.3	276,467	2.45
18	17,627	73	559,192	15.9	320,173	2.34
21	20,799	88	646,803	18.4	360,613	2.26
24	23,677	102	732,579	20.8	398,564	2.19
			Wheat $1.25			
3	3,026	12	50,417	2.0	45,722	10.74
6	6,077	20	113,056	4.4	97,418	7.23
9	8,992	33	199,427	7.8	164,427	5.70
12	11,783	48	268,707	10.5	216,077	5.10
15	14,788	66	338,945	13.3	265,827	4.64
18	17,821	81	417,346	16.4	317,832	4.19
21	20,786	94	486,701	19.1	362,224	3.91
24	23,718	111	570,691	22.4	414,425	3.65

There was a noticeable decline in wheat yields at higher retirement levels in the $2.00 wheat program. This was accompanied by an increase in average wheat acreage per farm from 45 acres at three percent to 114 at 24 percent. This change in wheat yields or wheat

acreage per farm did not occur in the $1.25 wheat program.

The cause of this phenomena lies in the geographical patterns of retirement caused by the two different wheat prices. When wheat is $2.00, predominately wheat farms are more profitable relative to farms with substantial acreages of competing crops. At this price, eight of the 11 farms retired at the three percent level were from Tillman County in the cotton area. Dropping the wheat price to $1.25 affects the specialized wheat farm most. At this price only four of the first 12 farms retired are from the cotton area.

Cropping Easement on Poorest Cropland

The theoretical efficiency of a loan to obtain cropping rights was computed on the poorest cropland category only for those farms designating such a category of land. Using the criterion of retiring farms that had a value of production higher than their variable production costs, it was possible to obtain only 12 percent of the land when wheat was valued at $2.00 and nine percent at $1.25. As mentioned earlier there were 93 farms with 3,990 acres in this category that produced nothing. In addition there were 22 farms with 607 poorest acres that were computed to be "unprofitable".

Tables VII and XXXIV contain data for this program alternative. Except for the three percent level of the $2.00 program, efficiencies are less for poor land retirement than for the whole farm easement program. Production removed at each retirement level lags behind the percentage of cropland removed. There appears to be little difference between the $2.00 program and the $1.25 program in size of farm or the land use pattern.

TABLE VII

THEORETICAL RANKING OF CROPPING EASEMENT ON POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,965	64	$ 70,918	2.0	$ 53,925	$4.17
6	5,926	94	135,187	3.8	87,998	2.86
9	8,906	126	197,280	5.6	114,416	2.38
12	11,850	166	245,243	7.0	128,259	2.10
			Wheat $1.25			
3	3,054	51	62,522	2.5	51,146	5.50
6	5,908	87	110,949	4.3	83,263	4.01
9	8,869	116	153,959	6.0	106,650	3.25

Ten-Year Retirement of All Cropland

Another program alternative considered was the familiar long term land retirement. In this case the farmer would retire his entire cropland base for ten years and receive an annual payment. The land could not be grazed. At a wheat price of $2.00 there were ten farms (1,522 acres) that did not cover variable costs. There were 11 such farms (1,691 acres) at $1.25.

These farms are not included in the program since their computed theoretical efficiency would be negative. Tables VIII and XXXV summarize the data for this program alternative. The $2.00 wheat price results in farms with a large proportion of cropland in hay, pasture, cotton, and fallow in the lower retirement levels. On the other hand,

the $1.25 price for wheat results in farms of predominate wheat acreage entering at lower diversion levels. In fact, the $1.25 wheat program results in about half as much sorghum being retired as the $2.00 program.

TABLE VIII

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF ALL CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	3,008	13	$ 80,330	2.3	$ 54,609	$3.12
6	6,061	27	190,847	5.4	119,223	2.66
9	8,664	35	276,827	7.9	165,687	2.49
12	11,642	45	350,242	9.9	202,030	2.36
15	14,889	60	450,408	12.8	247,705	2.22
18	17,710	72	550,977	15.6	291,522	2.12
21	20,737	86	638,558	18.1	328,003	2.06
24	23,761	102	730,529	20.8	364,902	2.00
			Wheat $1.25			
3	3,030	12	47,425	1.9	39,678	6.12
6	5,698	20	102,371	4.0	82,184	5.07
9	8,824	35	190,730	7.5	145,852	3.91
12	11,865	48	267,788	10.5	198,662	3.87
15	14,836	67	339,763	13.3	245,032	3.59
18	17,694	82	416,231	16.3	291,245	3.33
21	20,700	95	498,963	19.6	339,220	3.12
24	23,672	110	566,632	22.2	376,942	2.99

For both programs there is a peculiar change in size of farm and value of production per farm that takes place as the retirement level increases. At the first level farms are smaller than average in

acreage and production. At between nine and 12 percent of land retired they reach a peak in both measures. Beyond 12 percent the acreage per farm and production per farm decline.

Ten-Year Retirement of Poorest Cropland

In addition to those 93 farms which produced nothing on the poorest cropland category, there were eight farms with 88 acres of poor cropland that did not produce enough to cover variable production costs when wheat was priced at $2.00. This number rose to 21 farms and 412 acres at a wheat price of $1.25.

Tables IX and XXXVI summarize data for land that theoretically could be included in this program. The maximum acreage that could be obtained was 12 percent regardless of the wheat price assumed. The percentage of production removed at each retirement level was slightly over one-half of the percentage of land removed.

As increasing percentages of land are retired under this program the acreage per farm, value of production per farm, and wheat acreage per farm tend to increase. This tendency is more pronounced with wheat at $2.00.

Ten-Year Retirement of Poorest Cropland With Grazing Permitted

In all other programs alternatives presented in this analysis, grazing of diverted land was assumed to be prohibited. To measure the effect of this one factor, an alternative was also considered of allowing grazing on the poorest cropland diverted for ten years.

TABLE IX

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,979	65	$ 60,559	1.7	$ 45,088	$3.91
6	5,878	102	129,350	3.7	79,524	2.60
9	8,906	133	193,492	5.5	104,796	2.18
12	11,911	171	244,915	7.0	118,580	1.94
			Wheat $1.25			
3	2,985	58	60,358	2.4	47,555	4.71
6	5,905	93	111,814	4.4	78,971	3.40
9	8,857	124	152,125	6.0	99,555	2.89
12	11,808	163	192,203	7.5	113,936	1.69

When viewed as a production control program this alternative was considerably less effective, from a theoretical standpoint, than any other alternative. Besides the 93 farms that were already producing nothing on their poorest cropland, there were a large number of additional farms that would increase total value of production by discontinuing their present use of poorest cropland and converting it to pasture usage. This increase in output occurred on 75 farms and 4,949 acres with wheat priced at $2.00 and 111 farms with 8,466 acres when wheat was valued at $1.25. Therefore, it was profitable for the Government to retire only three percent of the land with this alternative with a $1.25 wheat price assumption, and only six percent with a $2.00

price assumption. The percentage of production removed was vastly less than the percentage of land removed.

Since production and variable production costs would still exist for land in this program a small modification of the efficiency calculated was used. Rather than using gross value of production before participation, the amount used in the efficiency formula was the net reduction in production -- production before program participation minus value of production as grazing. Variable costs were likewise modified -- production costs before participation minus production costs as grazing. Thus, the value of production and variable production cost figures in Table X are, in fact, the net reduction of the preparticipation values.

TABLE X

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF POOREST CROPLAND WITH GRAZING PERMITTED

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	3,012	40	$34,967	0.9	$26,987	$4.38
6	5,951	81	86,122	2.4	53,123	2.61
			Wheat $1.25			
3	2,989	52	36,909	1.4	25,513	3.24

By and large the value of production removed per dollar of payment for the grazing permitted program was not any greater than for retirement of the same land without grazing. Since so little land could profitably be included in this option, further comparison with other programs is difficult. Supplemental land use data are found in Appendix Table XXXVII.

Ten-Year Retirement of Wheat Allotments

The most specific type of control program would be one directed at a single crop. This particular program was directed at wheat. It retired the wheat allotment, retired an acreage of cropland the size of the allotment and prohibited the farmer from growing wheat on the remaining land.

In some cases the farmer may not be planting his entire wheat allotment. In this case, he would be diverting all wheat acreage usually planted plus an additional acreage of crop or fallow to equal in total the allotment acreage. In other cases the farmer may be using the substitution provision of present programs to exceed his wheat allotment by means of other crop bases. In this instance, the acreage of land retired is only the amount of the allotment, but crops other than wheat would have to be grown on the remaining former wheat acreage.

Tables XI and XXXVIII summarize data for this program. With three percent or six percent of the land retired, the average size of wheat allotments was substantially greater than the 146-acre average for the sample. On the other hand, ASCS projected wheat yields varied little as the percentage of cropland retired was increased and were very close to the sample average of 22.5. In spite of the picture of homogeneity

given by the ASCS projected yields there was a steady increase in value of wheat sold per acre as more of the cropland was retired. The average value of production retired per acre at the 24 percent retirement level was about two-thirds higher than at the three percent level. It would seem that ASCS projected yields underestimate actual yields on some farms, especially on farms with above average wheat yields.

TABLE XI

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,958	13	$ 87,145	2.5	$ 48,192	$2.24
6	5,951	35	219,530	6.2	109,858	2.00
9	8,854	59	382,571	10.9	178,171	1.87
12	11,821	83	525,000	14.9	234,649	1.81
15	14,773	101	694,365	19.7	299,014	1.76
18	17,884	124	873,395	24.8	363,525	1.71
21	20,834	146	1,010,480	28.7	410,876	1.68
24	23,609	160	1,152,687	32.7	458,310	1.66
			Wheat $1.25			
3	2,929	12	56,348	2.2	47,799	6.59
6	5,922	34	144,716	5.7	109,465	4.10
9	8,825	58	251,474	9.9	177,778	3.41
12	11,792	82	343,803	13.5	234.256	3.14
15	14,744	100	454,882	17.8	298,621	2.91
18	17,855	123	571,771	22.4	363,132	2.74
21	20,805	145	660,642	25.9	410,483	2.64
24	23,684	174	758,779	29.7	460,439	2.54

As with all other programs, there were some farms that had insufficient value of production to cover variable costs. With wheat at either price ($2.00 or $1.25) there were 35 farms with 4,839 acres of wheat allotment that were unprofitable. These farms are not included as participants in the program. Inclusion of this average size would increase program efficiency substantially, if participation was obtained for a nominal payment.

Ten-Year Retirement of Feed Grain Bases

Nationally several crops fall under the heading of feed grains. In the study area, however, only grain sorghum and forage sorghum were grown. In this program proposal the entire feed grain allotment would be retired, including an equivalent acreage of cropland. Furthermore, the participant could not produce any feed grain crop on his remaining acreage.

Sorghum is a secondary crop on most farms in the study area. The average sample farm averaged 27 acres of feed grain base with a projected yield of 32 bushels. When farms with feed grain bases that did not produce enough to cover variable costs were eliminated from participation, 4,040 acres of feed grain base (about one-third of the sample total) were affected.

As shown in Tables XII and XXXIX only six percent of the total cropland could be retired with this alternative. This ineffectiveness stems from the small average of feed grain loss and from the disqualification from participation of acreage with returns below variable costs. When wheat was valued at $2.00 the maximum value of production removed was only three and one half percent. Farms included in both

retirement levels averaged a much higher base per farm and a higher acreage of sorghum actually planted than the sample as a whole. At both retirement levels over 80 percent of the base had been planted.

TABLE XII

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF FEED GRAIN BASES BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
3	2,954	56	$ 45,841	1.3	$34,633	$4.09
6	6,028	80	122,410	3.5	66,903	2.21

One-Year Retirement of Poorest Cropland

Because one-year retirement programs have the smallest effect on variable production costs, the number of farms with variable costs in excess of value of production would be lowest with this kind of program. In fact, with wheat priced at $1.25 only ten farms with 156 acres in the poorest cropland category failed to cover variable costs. When wheat was priced at $2.00, only two farms with 26 acres were unprofitable. In addition there were 93 farms that produced nothing on 3,990 poorest acres.

Table XIII and XL display data for retirement levels up to 12 percent -- the maximum profitably attainable under this program. At

the three percent level the acreage per farm is slightly smaller than the sample average, but the value of production per farm is slightly larger. At retirement levels beyond three percent the acreage per farm increases moderately, but the value of production retired per farm increases more substantially. Other than these, there are few differences between the various retirement levels or between the $2.00 program and the $1.25 program.

TABLE XIII

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,943	69	$ 64,459	1.8	$ 43,004	$3.00
6	5,933	108	133,198	3.8	71,972	2.18
9	8,885	139	196,918	5.6	92,550	1.89
12	11,936	175	247,222	7.0	102,783	1.71
			Wheat $1.25			
3	2,968	66	58,679	2.3	43,086	3.76
6	5,917	96	112,114	4.4	71,626	2.77
9	8,915	136	152,051	6.0	88,646	2.40
12	11,824	169	194,015	7.6	100,430	2.07

One-Year Retirement of Wheat Allotments

As in the ten-year program for wheat, 35 farms with 4,839 acres of allotment not considered for participation because the value of production did not cover variable costs. A valid theoretical efficiency can only be computed when variable costs are less than the value of production. Tables XIV and XLI give data for those farms which were included up to 24 percent of all cropland in the sample.

TABLE XIV

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,888	13	$ 84,945	2.4	$ 41,458	$1.95
6	5,918	35	222,230	6.3	98,467	1.80
9	8,883	61	393,419	11.2	160,684	1.69
12	11,878	83	530,716	15.1	207,857	1.64
15	14,782	101	699,963	19.9	264,552	1.61
18	17,804	123	893,333	25.4	326,120	1.57
21	20,728	145	1,049,864	29.8	374,124	1.55
24	23,773	165	1,224,210	34.8	424,600	1.53
			Wheat $1.25			
3	2,859	12	55,142	2.2	41,098	3.93
6	5,889	34	146,489	5.7	98,107	3.03
9	8,872	61	259,466	10.2	160,684	2.63
12	11,849	82	348,505	13.7	207,497	2.47
15	14,861	101	462,358	18.1	266,037	2.36
18	17,775	122	584,827	22.9	325,760	2.26
21	20,699	144	686,201	26.9	373,764	2.20
24	23,744	164	800,729	31.4	424,240	2.13

There are several peculiarities associated with the three percent level when compared with higher levels of retirement. The average wheat allotment for the 12 or 13 farms in the three percent level was approximately 50 percent larger than the sample average. As the program moved into higher levels of retirement, the wheat acreage per farm approached the lower sample average, but the value of production per farm rose slightly. A rise in value of production per farm, accompained by a decline in the acreage, could only come about from higher yields. Such a rise in yields was not indicated, however, in the ASCS projected yields. The higher values of production at higher retirement levels caused the percentage of production removed to exceed the percentage of land retired.

One-Year Retirement of Feed Grain Bases

Reflecting the lesser role of grain sorghum in three of the four study counties, 117 farms with 3,601 acres of feed grain base did not produce enough to cover variable costs. As shown in Tables XV and XLII, this program was capable of reaching only six percent of the total cropland and 3.1 percent of the value of crops produced.

At three percent land retirement the predominance of retired acreage comes from forage sorghum -- indicative of its generally marginal profitability. At six percent, however, grain sorghum moves into the lead. In total, farms entering this program are much above the sample average farm in size of feed grain base and acreage of sorghum grown. The ASCS projected yield for program participants averages slightly less than the sample as a whole.

TABLE XV

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF FEED GRAIN BASES BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Variable Production Costs	Production Retired Per Dollar of Payment
3	2,933	59	$ 37,401	1.1	$27,573	$3.81
6	5,910	80	108,918	3.1	53,510	1.97

Comparison of Theoretical Results

The purpose of the entire presentation of data in the chapter up to this point has been to allow a factual comparison of a wide variety of programs under several sets of controlled conditions. Since this chapter is concerned with theoretical efficiencies, the results could in many cases have been predicted at the outset. Insofar as this was the case, at least the analysis measured the size of the relative differences between programs. The analysis has also established benchmarks against which will be measured to the farmers' stated payment requirements reported in the next chapter.

For purposes of comparison this discussion will revolve around three sets of supply curves for land entering the various programs being considered. These curves are drawn using marginal costs -- the cost of obtaining the next farm -- at each retirement level. In addition the reciprocal of the efficiency value, payment per dollar of production retired, rather than production per dollar of payment is used on the vertical axis. Efficiency values given earlier in the

tables are average figures for all farms included in programs up to a given retirement level. These differences make impossible direct comparison between the supply curves and the tables.

For any program which involves a given type of land retirement at a given retirement level and set of crop prices, we expcet program efficiency to increase as the time period is extended. This is apparent in the efficiency formula as more costs are included in the variable cost component in longer time periods. Figure 2 shows the relative performance of three programs to retire whole farms. Government land purchases and cropping easements are of course extremely long-term programs. They have a clear cost advantage over the ten-year program. A ten-year retirement program costs from 13¢ to 29¢ more per dollar of production removed, depending on the level of retirement and the program with which it is compared.

Figure 3 would appear to be a contradiction in that the ten-year retirement of poor cropland line crosses and exceeds the one-year line at retirement levels above eight percent of the cropland. This is a special case arising from the fact that almost all available land in the poorest cropland category is taken to enable the ten-year programs to reach 12 percent retirement. The last land entering the ten-year program at higher retirement levels raises the program costs sharply. Fewer poorest cropland segments were judged unprofitable in the one-year program (because fewer costs are variable) and hence the one-year program drew participants from a larger list of farms with available cropland.

Lest Figure 3 cast the ten-year retirement of poorest cropland with grazing permitted in an unfavorable light, a word of explanation

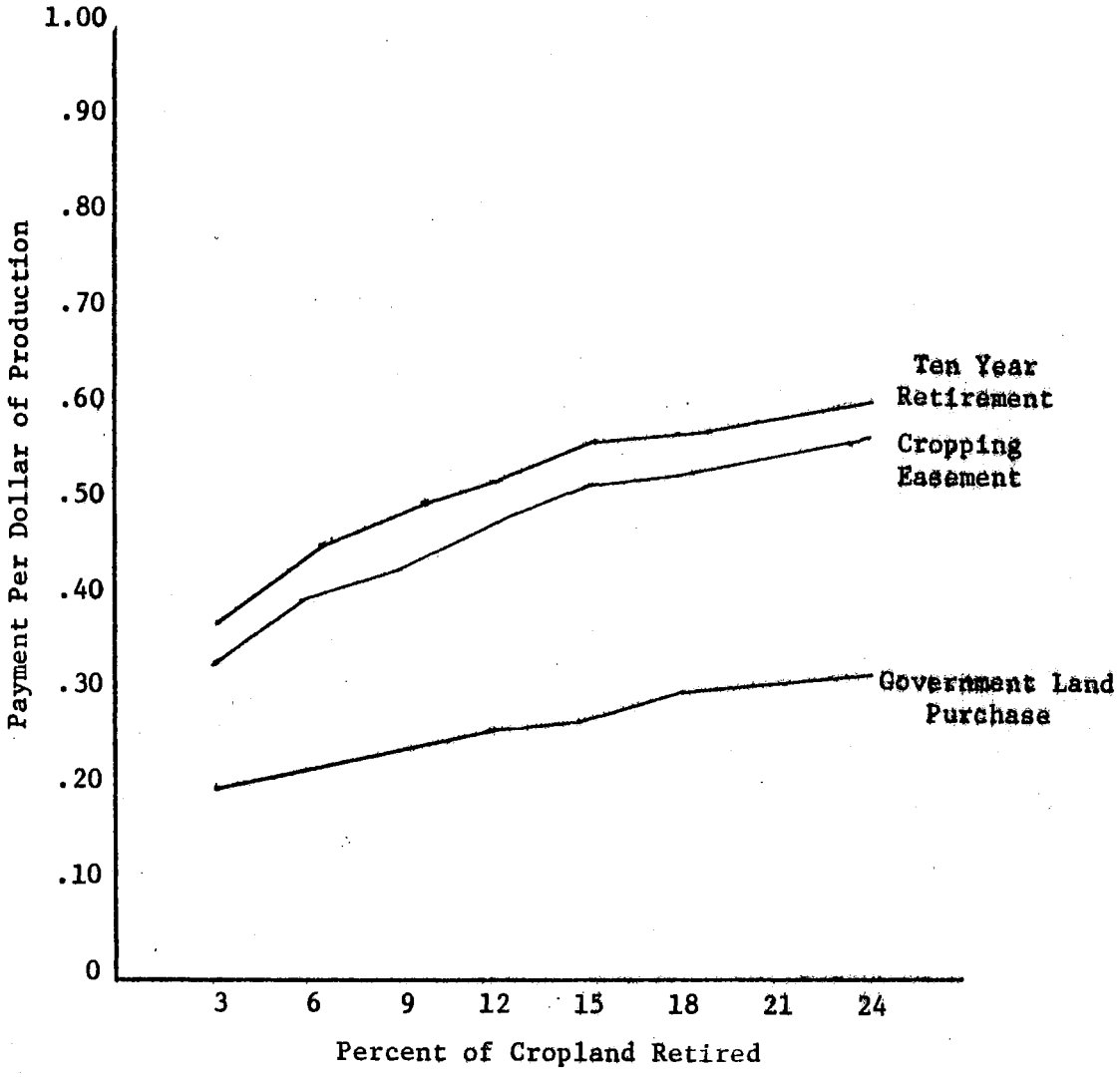

Figure 2. Comparison of Whole Farm Retirement for Varying Time Periods

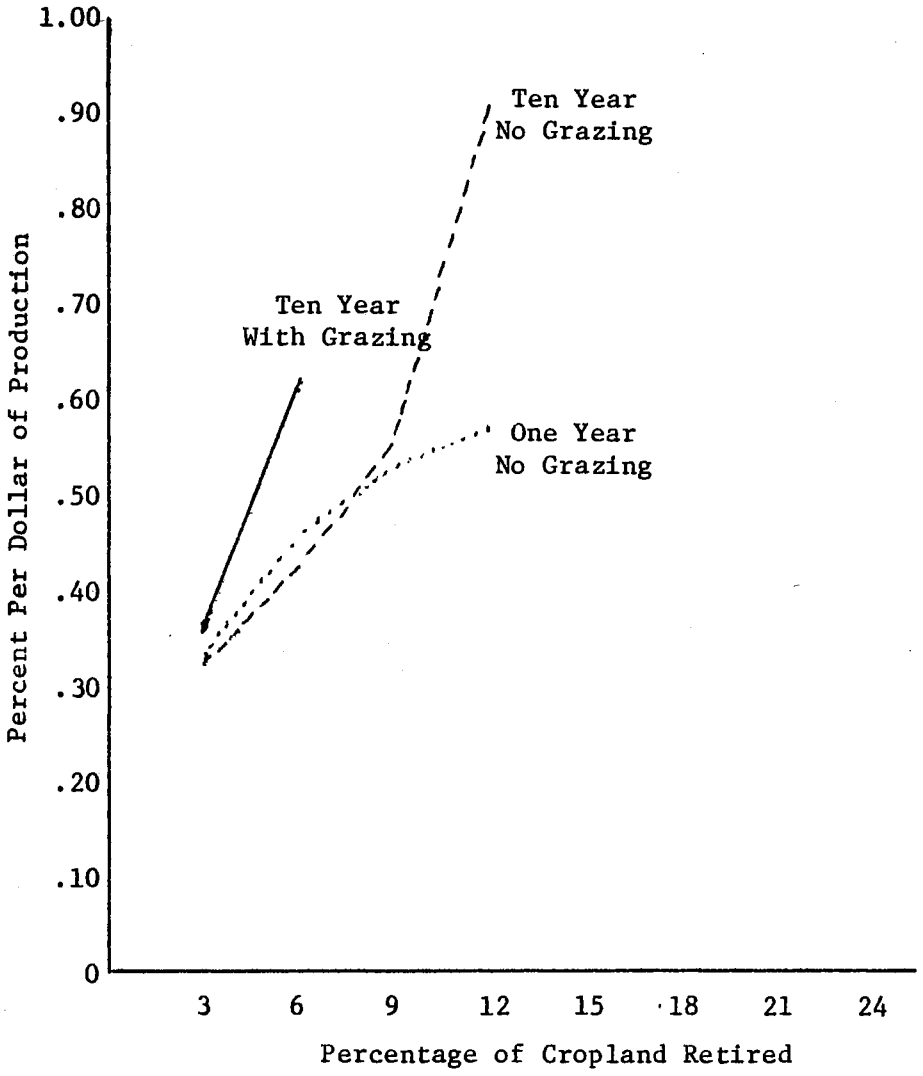

Figure 3. Comparison of Various Retirement Plans For Poorest Cropland Category

is necessary. Many farms were arbitrarily eliminated from this program because a conversion of their poorest cropland to permanent grazing would increase the net return from this land. It was not possible, therefore, to compute a payment that would induce these farms to participate. The number of farms remaining, for which a theoretical payment could be computed, was smaller than the list of potential participants for the other programs. This factor has likely distorted marginal cost data for the grazing option program.

Figure 4 compares several alternative short run programs. The cost advantage of the poorest cropland program is not as large as it appears. At a retirement level of 12 percent of cropland, only seven percent of the value of crop production has been removed. The wheat allotment program can remove the same amount of crop production by retiring only slightly more than six percent of the land. Thus the more relevant comparison is the 12 percent poorest land cost (57¢) with the six percent wheat allotment cost (62¢) rather than the 12 percent wheat allotment cost (66¢). The wheat allotment program also has the highest potential in terms of the amount of production it can remove at fairly constant costs.

The data for all three figures used in this discussion are based on an assumed wheat price of $2.00 per bushel. In the discussion of individual programs earlier in the chapter, it was amply demonstrated that a lower wheat price raises program efficiency. Since income maintenance is one of the stated goals of our supply control policies, allowing wheat to fall to $1.25 would offset part of the purpose of the programs. It is possible however to lower support prices, thereby

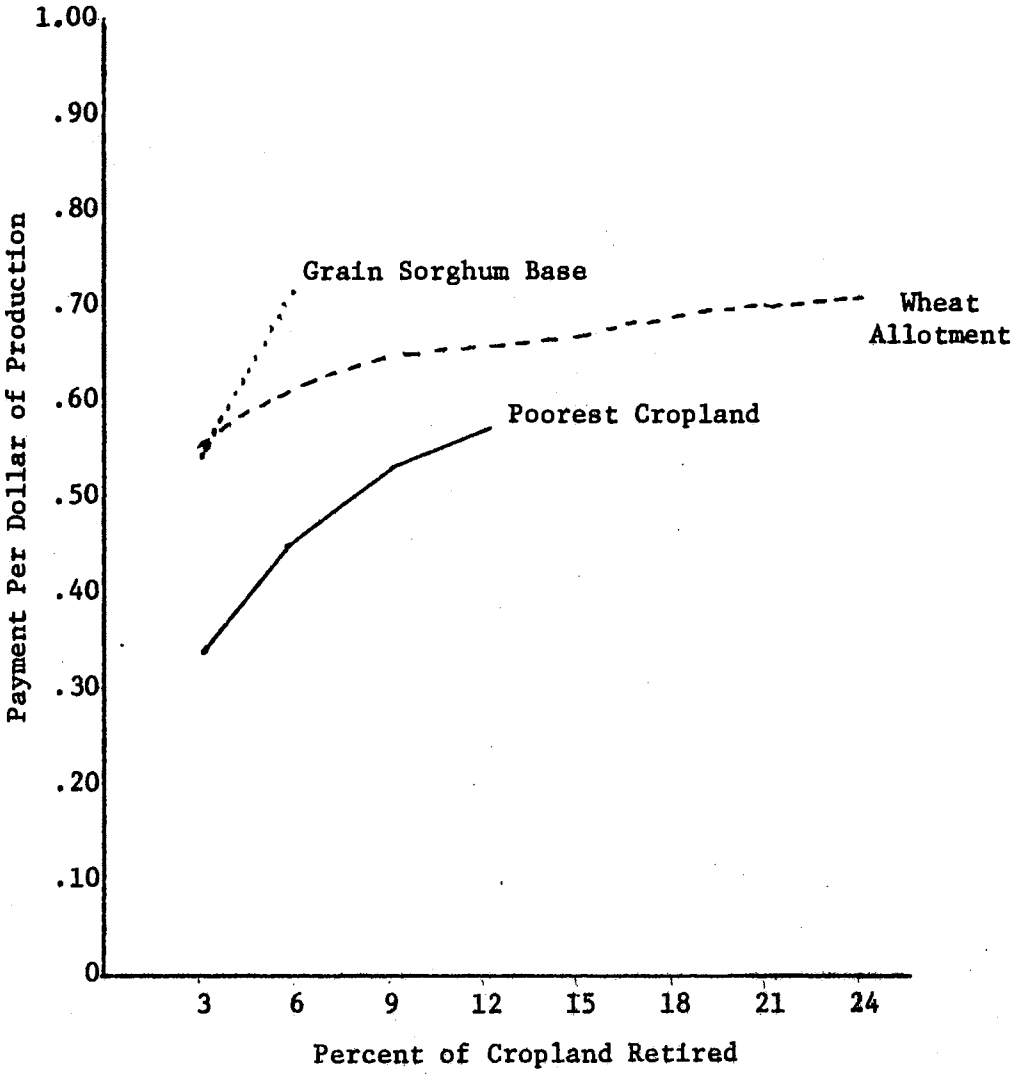

Figure 4. Comparison of Various Diversion Programs for a One Year Period

increasing program efficiencies, and use the savings obtained to pay a direct income subsidy to producers.

By way of recapitulation, Table XVI shows a ranking of program alternatives on the basis of their theoretically computed average efficiency assuming a nine percent land retirement level and a price of $2.00 for wheat. Whole farm programs appear to have an advantage as this type program appears in the top three positions. Wheat allotment programs appear to be at a disadvantage. With the theoretical ranking established we will examine in the next chapter the efficiencies calculated from farmers' asking rates.

TABLE XVI

EFFICIENCY RANKING OF PROGRAM ALTERNATIVES AT NINE PERCENT LAND RETIREMENT LEVEL, WHEAT $2.00

Program Type	Average Efficiency[a]
Government purchase of entire cropland	$4.88
Cropping easement on entire cropland	2.80
Ten-year retirement of entire cropland	2.49
Cropping easement on poorest cropland	2.38
Ten-year retirement of poorest cropland	2.18
Government purchase of poorest cropland	1.98
One-year retirement of poorest cropland	1.89
Ten-year retirement of wheat allotment	1.87
One-year retirement of wheat allotment	1.69
Ten-year retirement of poorest cropland with grazing permitted	b
Ten-year retirement of feed grain base	b
One-year retirement of feed grain base	b

[a]Production removed per dollar of program cost.

[b]These programs were unable to achieve retirement of nine percent of the available cropland.

FOOTNOTES

[1]Sobering and Tweeten, p. 822.

[2]Larry J. Conner, et. al., Alternative Crop Enterprises on Clay and Loam Soils of North Central Oklahoma (Oklahoma Agricultural Experiment Station Processed Series, No. P-550, Stillwater, 1966); Larry J. Connor, Roy E. Hatch, and Odel Walker, Alternative Crop Enterprises on Loam and Sandy Soils of Northwest Oklahoma (Oklahoma Agricultural Experiment Station Processed Series, No. P-552, Stillwater, 1966); John W. Green, Vernon R. Eidman, and Larry Peters, Alternative Irrigated Crop Enterprises on Clay and Sandy Loam Soils of the Oklahoma Panhandle (Oklahoma Agricultural Experiment Station Processed Series, P-554, Stillwater, 1967); P. Leo Strickland and Terry Dunn, Alternate Crop Enterprise Budgets for Dryland Production, Southwestern Oklahoma (Oklahoma Agricultural Experiment Station Processed Series, No. P-599, Stillwater, 1969).

CHAPTER IV

PROGRAM EFFICIENCIES BASED ON FARMERS' RESPONSES

In the last chapter theoretical efficiencies were presented for the various program alternatives. Efficiencies were based on the assumption that each farmer would participate in a program if it was his most profitable alternative. Also assumed was that the farmer and the researcher accurately knew the variable costs and returns from crop production for each production unit under consideration.

In this chapter a different analytical technique is reported and a different set of assumptions is required. It is recognized here that goals other than profit maximization may influence farmers' decisions about program participation. A fuller discussion of these goals will be postponed, however, until the next chapter. It is still necessary, for meaningful analysis, that the farmer and the researcher know accurately the expected returns from crop production for each farm or part of the farm. Rather than variable costs, however, the researcher must use the amount of payment the farmer believes is necessary for him to participate in the program.

How the farmer reaches a determination of a proper participation payment is known only to him. He takes into account among other things his idea of expected costs and returns, how long the program would freeze his managerial perogatives and what others think of the program in question. In fact, the figure given by a farmer when faced with a

hypothetical program may not even accurately correspond to his reaction in a real life situation. Nevertheless, in this chapter, program efficiencies are computed on the basis of the farmers' stated payment requirement for participation. Value of crop production is computed in a manner identical to that used for theoretical efficiencies described in the last chapter.

For all program alternatives studied the sample is subdivided into three groups. In the first group are all farms that elected not to participate in the program. These farms are referred to in the discussion as nonparticipants. The second group consists of all farms that stated a payment requirement for participation, but analysis indicated that the payment requirement is more than the value of production removed. To retire these farms is unprofitable for the Government, so they are referred to as unprofitable farms in the discussion. The third group contains farms which were willing to participate at a payment rate less than the gross value of production.

Program participants were selected from the third group in a manner similar to the theoretical analysis. Farms were ranked from greatest to least efficiency within each county. To present land retirement from becoming focused heavily in certain local areas, the county list was truncated when 30 percent of the total cropland for that county sample was reached. The four county lists were combined and the farms ordered again from highest to lowest efficiency. The combined list was broken into segments representing three percent segments of the cropland base for the sample. Tabular data presented for each program alternative summarize the cumulative average efficiencies in three percent steps up to a maximum of 24 percent of

the total cropland. It was not envisioned that land retirement in excess of 24 percent would become necessary.

Government Purchase of Entire Cropland

The least popular land retirement program suggested in this survey was Government purchase of land. The magnitude of disfavor with which this program is held may be indicated by the fact that only 29 farms were offered in the sample survey. Of these 29, 12 were offered at a price so high that the annual cost of ownership to the Government (six and one half percent of the gross purchase price) was more than the value of production with wheat priced at $2.00. Three more of the 29 became unprofitable at a wheat price of $1.25. The farms which remained, amounting to three percent of the land in the sample are described in Tables XVII and XLIII.

It is unusual that although these farms accounted for only three percent of the land, they remove over four percent of the value of production. The farms included in this sample average about 1/5 smaller in cropland acreage than the entire sample. In spite of this, sales per farm are about 1/5 higher than average for the sample. Program participants average a higher proportion of land in wheat and cotton and are lower than the sample in proportion of land in sorghum, barley, hay, pasture, and fallow. Program farms do not have a larger wheat allotment than average, but do grow more wheat on their feed grain bases and barley, oat, and rye bases. Projected wheat yields are substantially above average while sorghum and cotton yields are substantially lower.

TABLE XVII

INDICATED RESPONSE TO GOVERNMENT PURCHASE OF ENTIRE CROPLAND

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Land Cost	Annual Ownership Cost	Production Retired Per Dollar of Cost
				Wheat $2.00			
3	2,980	17	$171,860	4.8	$1,218,090	$79,276	$2.16
				Wheat $1.25			
3	2,786	15	109,763	4.3	1,079,750	70,184	1.56

In summary it would appear that the purchase of some good farms, as described here, can be a profitable means of reducing crop production. The extent to which it would be effective would be severely limited by the public attitude.

Government Purchase of Poorest Cropland

Although the purchase of entire farm cropland base retired only a small acreage, the purchase by the Government of the poorest cropland category on farms retired even less acreage. To begin with, not all farms indicated a poorest cropland category. Of those farms which did, only 14 expressed a willingness to sell to the Government. At a wheat price of $2.00, five of these were worth buying; at $1.25 wheat only four were profitable buys.

Tables XVIII and XLIV contain data for these tracts of cropland. Since only 0.1 percent of the land and a like percentage of value of production could be removed by this program, it is an ineffective alternative.

Cropping Easement on Entire Cropland

A cropping easement can accomplish many of the same objectives as Government land purchase and at the same time can overcome some of the objections. Cropping easement involves a single, one time payment; in this case a non-recourse, interest free loan to the participant. The time period can extend to perpetuity if not cancelled by either party -- thus reducing administrative costs. Title to the land and even use of the land for non-agricultural purposes remain in the private domain. The only questions remaining are: (1) is this program

TABLE XVIII

INDICATED RESPONSE TO GOVERNMENT PURCHASE OF POOREST CROPLAND

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Land Cost	Annual Ownership Cost	Production Retired Per Dollar of Cost
				Wheat $2.00			
0.1	132	5	$4,287	0.1	$38,892	$2,528	$1.70
				Wheat $1.25			
0.1	129	4	2,694	0.1	37,092	2,411	1.12

efficient from the standpoint of production removed per dollar of cost? (2) Is this program sufficiently acceptable to farmers that a significant reduction in production can be achieved?

These questions are answered in Tables XIX and XLV. Over the range of acceptance in this sample, efficiencies varied between $3.70 and $1.43 depending on the support price of wheat assumed and the level of land retirement desired. In the case of $2.00 wheat it was economically feasible to remove up to 15 percent of the land and 18 percent of the value of crop production. Even at a wheat price of $1.25 it was profitable to go as high as 12 percent of the land. There were still a number of farms that would not participate in this program and a large number that ask a loan so large that participation would not have been economically justified.

The first farms that would be drawn into this program are slightly smaller than the sample average in terms of total crop acreage and value of production sold per farm. Beyond the six percent retirement level, however, they noticeably exceed the sample average for these two parameters.

This program has attracted farms with a high proportion of land in wheat and a low proportion in hay, pasture, and fallow when compared with the sample. Sorghum projected yields are highest at the low retirement level and fall to average at higher levels of retirement. Wheat projected yields, on the other hand, start out lower than average and end up higher. Cotton acreage is insignificant at all levels of the program and the farms participating have a lower than average projected yield.

TABLE XIX

INDICATED RESPONSE TO CROPPING EASEMENT ON ENTIRE CROPLAND
BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Loan	Annual Cost at 6½%	Production Retired Per Dollar of Cost
				Wheat $2.00			
3	2,911	13	$102,374	2.9	$ 426,200	$ 27,704	$3.70
6	5,938	21	214,029	6.1	1,178,760	76,620	2.79
9	8,959	32	371,975	10.6	2,506,270	162,908	2.28
12	12,310	45	494,986	14.1	3,727,230	242,270	2.04
15	14,802	56	637,578	18.1	5,515,060	358,479	1.78
				Wheat $1.25			
3	2,846	13	72,187	2.8	418,076	27,175	2.66
6	5,885	20	143,821	5.6	1,132,160	73,591	1.95
9	9,216	30	241,997	9.5	2,301,030	149,567	1.62
12	12,026	42	339,196	13.3	3,650,800	237,302	1.43

Cropping Easement on Poorest Cropland

As in the case of the program to purchase the poorest cropland on each farm, a program for the purchase of easements on the poorest cropland drew no response on 216 of the 279 farms which designated some cropland as "poorest". In addition, 55 of those responding asked a loan so high that the annual cost to the Government would exceed the value of production when wheat was priced at $2.00.

Tables XX and XLVI show the totals for the six to eight farms for which program participation would be desirable from the Government's standpoint. Acreages and value of production removed are insignificant.

Ten-Year Retirement of Entire Cropland

This program was one of the more familiar to those interviewed, being known to them previously as the "soil bank". A wide number of farms were offered for participation. Still there were 205 farms out of 421 that declined to quote a required payment for participation. Of the 216 farms that responded favorably, 66 asked a payment rate higher than the value of production with wheat price at $2.00. The number of unprofitable farms nearly doubled to 129 with wheat priced at $1.25

The data in Tables XXI and XLVII show that a considerable percentage of the cropland base can profitably be reached with a ten-year whole farm program. Efficiencies are high at all retirement levels, although the $1.25 program averages a little lower in efficiency and reaches its maximum at 18 percent of the land.

This program can operate successfully and attract large viable farms. The percentage of production removed is larger than the

TABLE XX

INDICATED RESPONSE TO CROPPING EASEMENT ON POOREST CROPLAND

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Gross Land Cost	Annual Ownership Cost	Production Retired Per Dollar of Cost
				Wheat $2.00			
0.2	211	8	$7,049	0.2	$64,938	$4,221	$1.67
				Wheat $1.25			
0.1	94	6	2,896	0.1	25,185	1,637	1.77

percentage of land retired at all levels. The farms in this program average between $1,700 and $2,000 more in value of production per farm than the sample. In lower levels of land retirement the effect on cotton and grain sorghum is particularly strong. At higher levels of retirement wheat is retired at an accelerated rate. There appears to be no trend in any of the projected yields from lowest levels of participation.

TABLE XXI

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF ENTIRE CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	3,162	15	$ 150,453	4.3	$ 53,466	$2.81
6	5,917	25	290,181	8.2	113,136	2.56
9	8,448	34	406,139	11.5	163,191	2.49
12	11,859	51	560,364	15.9	238,971	2.34
15	14,890	65	718,072	20.4	331,118	2.17
18	17,763	82	864,965	24.6	426,762	2.03
21	20,734	93	980,714	27.9	509,412	1.93
24	23,684	103	1,089,824	31.0	591,242	1.84
			Wheat $1.25			
3	2,951	13	106,348	4.2	47,350	2.25
6	5,711	25	197,956	7.8	102,517	1.93
9	8,865	39	315,998	12.4	180,904	1.75
12	11,871	50	400,105	15.7	240,868	1.66
15	14,696	64	501,599	19.7	321,089	1.56
18	17,675	76	609,510	23.9	416,916	1.46

Ten-Year Retirement of Poorest Cropland

As with other part farm programs directed toward the poorest cropland category discussed thus far, a significant level of land or crop production cannot be profitably retired in this manner. Those eligible who did not wish to participate numbered 173, and 86 to 89 more would have been unprofitable from the standpoint of the Government.

Tables XXII and XLVIII show the total profitable participation available. Less than one percent of land and production were obtained.

TABLE XXII

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF POOREST CROPLAND

Percent of All Cropland	Total Acres	Number of Farms	Value of Production[a]	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
0.6	545	21	$15,193	0.4	$8,634	$1.76
			Wheat $1.25			
0.5	457	18	9,883	0.4	6,410	1.54

[a]Original value of production minus value of grazing.

Ten-Year Retirement of Poorest Cropland With Grazing Permitted

It would seem plausible that allowing grazing on land diverted from crop production would both elicit more participation and reduce

the payment required by farmers. Judging from the responses shown in Table XXIII, allowing grazing has a negligible effect on response. Only five more farms were offered. It resulted in two more profitable farms when wheat was priced at $2.00 and no additional profitable farms at $1.25. The amount of land retired and the value of production removed are insignificant.

TABLE XXIII

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF POOREST CROPLAND WITH GRAZING PERMITTED

Percent of All Cropland	Total Acres	Number of Farms	Value of Production[a]	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
0.5	467	23	$10,776	0.3	$5,525	$1.95
			Wheat $1.25			
0.4	347	18	5,113	0.2	3,395	1.51

[a]Original value of production minus value of grazing.

Ten-Year Retirement of Wheat Allotment

Under this program the farm would not be allowed to produce wheat and would be required to retire an acreage of cropland the size of the wheat allotment. All but five of the 421 farms were eligible by means of having a wheat allotment. Of those eligible, 213 indicated a

payment rate at which they would be willing to participate. With wheat valued at $2.00, 39 of these farms were rejected as asking more than the value of production. When wheat was priced at $1.25 the number of unprofitable farms increased to 92.

Tables XXIV and L show the extent and effect of participation in this program. It is possible to remove a large percentage of land through this means. The percentage of production removed is in excess of the percentage of land.

TABLE XXIV

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	2,962	18	$ 177,471	5.0	$ 46,887	$3.78
6	5,970	43	368,822	10.5	114,554	3.22
9	8,931	67	565,468	16.1	197,716	2.86
12	11,862	84	728,974	20.7	276,847	2.63
15	14,694	102	909,381	25.8	374,669	2.43
18	17,833	121	1,090,359	31.0	484,574	2.25
21	20,487	134	1,196,732	34.0	556,859	2.15
24	23,642	147	1,328,668	37.7	655,977	2.03
			Wheat $1.25			
3	2,962	18	115,803	4.5	46,887	2.47
6	5,834	41	228,985	9.0	107,588	2.13
9	8,931	67	369,384	14.5	197,716	1.87
12	11,860	85	478,084	18.7	278,904	1.71
15	14,844	102	591,360	23.2	374,018	1.58
18	17,748	121	707,677	27.7	482,699	1.47

Farmers did not differentiate between the $2.00 price of wheat and the lower wheat price when responding to this question. Thus, only one payment requirement was given per farm. The result of this is a naturally lower efficiency for the $1.25 program.

At the three percent level of land retirement, wheat acreage per farm averaged 50 percent larger than the sample acreage. Nearly one-quarter of the wheat acreage was grown on feed grain or other bases under the substitution provision of the wheat and feed grain programs. Wheat projected yields were lowest at the three percent land retirement level. At higher retirement levels the average wheat acreage per farm dropped to the sample average, but the yield increased by about three bushels per acre.

Ten-Year Retirement of Feed Grain Base

Only 219 of the 421 sample farms had feed grain bases. Some of the 219 used their feed grain bases for wheat production. Some others used the feed grain base solely for the production of forage sorghum which was consumed on the farm. Thus, less than half the feed grain bases in the sample was actually used in the production of grain sorghum.

Of the 219 bases examined, 107 farms were not interested in participating in ten-year retirement from feed grain production and retirement of an acreage of cropland equal to the feed grain base. Of those who stated a payment requirement for participation, 88 asked more than the value of production.

The remaining 24 farms are detailed in Tables XXV and LI. Only 1.8 percent of the land and 2.2 percent of the value of crop production

can be removed by this program. Yet it is a program which is attractive to the larger feed grain producer. The 24 farms averaged 68 acres of grain sorghum actually grown -- about six times as large as the sample average. Projected yields of participants averaged over ten percent higher than the sample.

TABLE XXV

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF FEED GRAIN BASES

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
1.8	1,812	24	$77,054	2.2	$39,179	$1.97

One-Year Retirement of Poorest Cropland

Retirement of poorest cropland was more popular on a one-year basis than for any other time period. The number of farms not at all interested was 133, which was 40 less than for the ten-year program. However, the number of farms that would be rejected for asking more than value of production was 25 higher when wheat was valued at $2.00 and 28 higher at $1.25 wheat. Thus, most of the prospective new participants would not be accepted in the selection process.

Tables XXVI and LII show the acreage and production that would enter the program on a profitable basis. As in the case of other poor

land, part farm retirement programs, the impact on value of production is too small to be effective.

TABLE XXVI

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF POOREST CROPLAND

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
0.9	861	36	$24,558	0.7	$13,955	$1.77
			Wheat $1.25			
0.8	743	30	16,672	0.8	11,031	1.51

One-Year Retirement of Wheat Allotment

This was the only program alternative in which the farmer, when interviewed, actually quoted one payment requirement assuming that wheat was supported at $2.00 and another payment requirement for wheat at $1.25. In previous programs studied no wheat price was stated to the farmer when the question was asked. Even when given the opportunity to revise his answers depending on the support price, the farmer stated payment requirements gave a lower efficiency to the $1.25 wheat program. Farmers did not reduce their payment requirements in proportion to the drop in net income per acre that would result from the lower wheat price.

As in the case of other one-year programs, this alternative drew a higher rate of participation than the ten-year allotment retirement program. Less than one-third refused participation outright. The unprofitable category contained 59 with wheat at $2.00 and 83 with the $1.25 price.

Tables XXVII and LIII show the effect of retiring as much as 24 percent of the cropland base. Percentage of production removed runs 50 percent to 100 percent ahead of the percentage of acreage retired. Efficiencies are high and remain high through a significant level of production removal. Both the $2.00 program and the $1.25 program drew farms which produced wheat in acreages above the size of their wheat allotments through the substitution of feed grain and other bases. While the farms included in both programs had wheat allotments that were very close to the sample average, the acreage of wheat produced per farm at all levels of both programs was about 20 percent greater than the sample mean.

One-Year Retirement of Feed Grain Base

As with other short-term programs, a one-year retirement of feed grain bases was more popular than a similar ten-year program. The number of farms willing to participate was 13 more than with the ten-year program. Unfortunately, nine of these prospective new participants landed in the unprofitable category.

Only slightly more land and value of production were removed by a one-year feed grain retirement program than by a ten-year program. Cropland retired was less than three percent. The data are summarized in Tables XXVIII and LIV.

TABLE XXVII

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
			Wheat $2.00			
3	3,029	25	$ 241,534	6.9	$ 69,832	$3.46
6	5,938	48	419,069	11.9	136,503	3.07
9	8,844	65	618,695	17.7	219,247	2.82
12	11,836	84	807,785	22.9	304,074	2.66
15	14,757	110	1,002,852	28.5	401,860	2.50
18	17,914	127	1,176,698	33.4	498,444	2.36
21	20,742	161	1,336,375	38.0	593,319	2.25
24	24,145	178	1,470,879	41.8	679,372	2.16
			Wheat $1.25			
3	2,933	20	107,895	4.2	30,269	3.56
6	5,959	42	242,037	9.5	85,023	2.85
9	8,891	63	360,467	14.1	138,869	2.60
12	11,791	84	472,261	18.5	193,993	2.43
15	14,835	105	606,732	23.8	268,555	2.26
18	17,649	117	702,426	27.5	326,320	2.15
21	20,763	135	818,963	32.1	401,127	2.04
24	23,649	153	928,795	36.4	476,212	1.95

TABLE XXVIII

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF FEED GRAIN BASES

Percent of All Cropland	Total Acres	Number of Farms	Value of Production	Percent of All Production	Annual Payment	Production Retired Per Dollar of Payment
2.2	2,189	28	$85,789	2.4	$53,528	$1.60

Comparison of Program Alternatives

In the previous chapter on theoretical efficiencies it was stated that an efficiency ranking of the various programs could almost be made before any analysis was done. This foreknowledge was possible because the efficiencies were calculated from a formula -- the components of which were known to vary in a certain consistent manner. Not so in this chapter where efficiencies are based on the farmers' stated payment requirements. Here the analysis takes on the nature of a series of contests. A program popularity contest by the farmer, in which he votes for his favorites by indicating how willing he is to participate. A contest on the part of the Government, in which it accepts for participation those farms which will accomplish the program goals at a minimum of cost.

Even though the analysis of this chapter is based on the assumption of price discrimination on the part of the Government, the results are somewhat comparable to present practice in the real world. Government program payments vary among farmers to some extent on the basis of yield differences. Although yield differences do not explain all the variation in farmers' willingness to participate in programs, at least to some degree the Government pays according to the production it removes.

For purposes of comparison, the discussion will center around the four most popular programs: cropping easements on entire cropland units, ten-year retirement of wheat allotments, ten-year retirement of entire cropland units, and one-year retirement of wheat allotments. Of the 12 program alternatives, only these four programs were able to retire more than three percent of the cropland base in the sample.

These four programs are ranked in Table XXIX on the basis of their average efficiency, computed from farmers' indicated response assuming a nine percent retirement level and a price of $2.00 for wheat. The average efficiencies were tested with a "t" test procedure. The difference between the ten-year and one-year wheat allotment retirement programs was not statistically significant at the five percent level. The difference between all other program pairs were significant at the five percent level.

TABLE XXIX

RESPONSE EFFICIENCY RANKING OF PROGRAM ALTERNATIVES AT NINE PERCENT LAND RETIREMENT LEVEL, WHEAT $2.00

Program Type[a]	Average Efficiency[b]
Ten-year retirement of wheat allotment	$2.86
One-year retirement of wheat allotment	2.82
Ten-year retirement of entire cropland	2.49
Cropping easement on entire cropland	2.28

[a]All other program alternatives were unable to achieve retirement of nine percent of available cropland.

[b]Production removed per dollar of program cost.

The marginal costs of retiring land under the four alternative programs are shown in Figure 5. The vertical axis shows the payment per dollar of production retired -- the reciprocal of the program efficiency values used in the data tables. Figure 5 also differs from the data tables in that the graph is based on marginal costs at each level of retirement, while the efficiencies given in the tables are based on average values for all retirement up to the specified level.

The retirement programs directed against wheat allotments show a higher efficiency at all levels than whole farm retirement programs. Although Figure 5 shows a cost advantage for wheat allotment programs of around ten cents per dollar of production retired, the real difference is greater. At the level of 12 percent land retirement the two wheat allotment programs are actually retiring between 20.7 percent and 22.9 percent of the value of crop production. Thus, as much production can be removed by retiring six percent of the land under the allotment programs as by retiring 12 percent of the land under the whole farm program.

It should be pointed out, however, that the whole farm programs are effective in the control of a variety of crops, including feed grains and cotton as well as wheat. The use of a wheat allotment program would not solve the all problem of oversupply in other crops, but it would make less wheat available for feed. In this study program alternatives directed toward retirement of feed grain bases were not successful in the economical removal of much more than two percent of the value of crop production. Perhaps, the sample area was atypical in this regard. No cotton allotment program was included in the study.

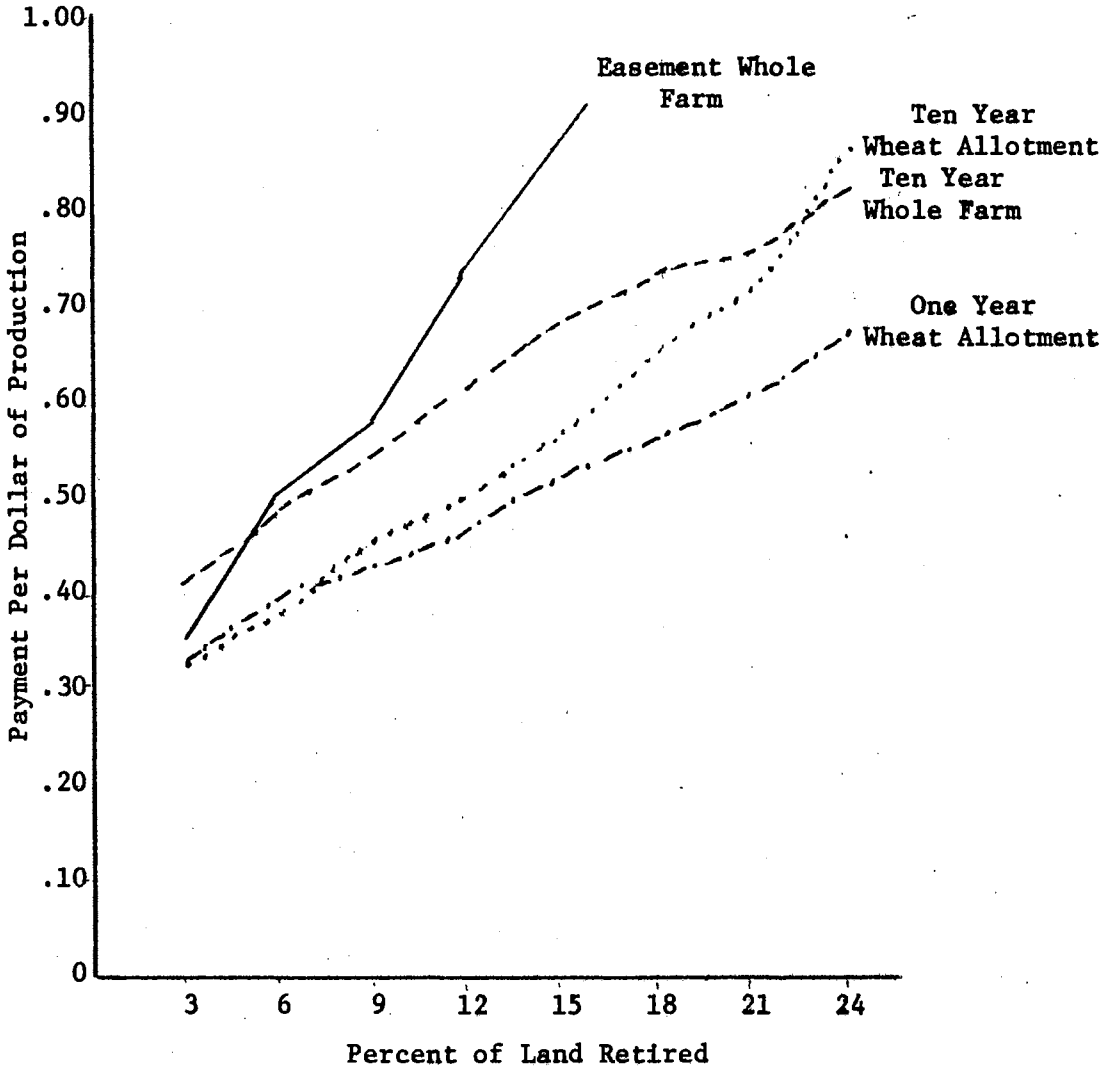

Figure 5. Response Comparison of Various Diversion Programs, Wheat $2.00

CHAPTER V

COMPARISON OF PROGRAM RANKINGS BETWEEN THEORETICAL RATES AND FARMERS' ASKING RATES

If all farmers interviewed acted according to the profit maximizing assumptions stated at the beginning of Chapter III there would be no need for this chapter. On the other hand, it would be naive to assume that those whose actions do not conform to our theoretical analysis were impractical, ignorant, or failed to take advantage of opportunity. The purpose of this chapter is to discuss the differences between the theoretical ranking and the farmers' ranking of the various program alternatives. In particular, we are interested in defining the nature and extent of such differences and what factors might be associated with them in a causal sense.

The goal of a farm manager might be broadly defined as maximization of his utility subject to political, economic, and other environmental restraints. This definition is useful only in the broad sense because a farm manager's utility function cannot be specified accurately and may be heavily affected by his family, creditors and others of influence.

In most forms of economic analysis, the problem of utility definition is dealt with by assuming that profit maximization comes closer to utility maximization than any other measurable concept. This

approach ignores the effect of attitudes, values, and interests which the farm manager weaves into his decision making process. In fact, it is virtually impossible for the theoretical analysis to consider any parameters except those which relate solely to the farm, thereby ignoring those parameters which relate to the manager.

As the data which follows will illustrate, the 197 farm owner-operators or tenant-operators in this sample did not respond as if short-run profit maximization was their overriding goal. It does not appear that their actions were always designed to maximize the present value of the discounted stream of profits over the planning horizon. Increasing the size of the farming operation in terms of dollar sales and acres was important to some decision makers. Belief in a set of values about what was "good" and "bad" influenced many of the answers given.

In using the data for the farmers' indicated program responses, it must be remembered that the responses are merely stated intentions. There is always present an undefined gap between the stated participation intentions or payment requirements and the actual performance in a genuine situation. It is likely that this performance gap is greatest for more complicated or less familiar programs. The farmers' response may indicate low cost-effectiveness for a complicated or strange program, but actual cost-effectiveness likely would improve after farmers were exposed to the program for some time.

Table XXX compares and contrasts the order of ranking achieved by each method of analysis -- the theoretical versus the farmers' stated payment requirements. The standard error -- a measure of reliability -- is given for each estimated mean. There are several points of agreement

TABLE XXX

COMPARISON OF THEORETICAL AND FARMER PROGRAM RANKINGS AT NINE PERCENT LAND RETIREMENT LEVEL, WHEAT $2.00

Program	Theoretical			Farmer Response		
	Ranking	Efficiency[a]	Standard Error of Estimate	Ranking	Efficiency[a]	Standard Error of Estimate
Government purchase of entire cropland	1	4.88	1.22	b	b	
Government purchase of poorest cropland	6	1.98	.85	b	b	
Cropping easement on entire cropland	2	2.80	1.56	4	2.28	.21
Cropping easement on poorest cropland	4	2.38	1.58	b	b	
Ten-year retirement of entire cropland	3	2.49	.28	3	2.49	.20
Ten-year retirement of poorest cropland	5	2.18	5.62	b	b	
Ten-year retirement of poorest cropland with grazing permitted	b	b		b	b	
Ten-year retirement of wheat allotment	8	1.87	.55	1	2.86	.61
Ten-year retirement of feed grain base	b	b		b	b	
One-year retirement of poorest cropland	7	1.89	2.47	b	b	
One-year retirement of wheat allotment	9	1.69	.29	2	2.82	.44
One-year retirement of feed grain base	b	b		b	b	

[a]Production removed per dollar of program cost.

[b]Less than nine percent of the available cropland would be retired under these programs.

concerning which programs might be ineffective: (1) ten-year retirement of poorest cropland with grazing permitted, (2) ten-year retirement of feed grain bases, and (3) one-year retirement of feed grain bases. There is also the interesting, although probably insignificant, coincidence between methods of analysis in ranking and efficiency of the ten-year retirement of farms' entire cropland. Five programs which were indicated to be workable by the theoretical analysis were designated ineffective by the farmer analysis. There were four programs which both methods of analysis found effective, but the order of program efficiency ranking was nearly opposite. In one case, cropping easements on entire cropland units, the theoretical production removed per dollar of program cost appeared higher than the efficiency based on the farmers' stated payment requirement. The difference between the theoretical mean efficiency and the mean efficiency as determined from farmers' responses was not statistically significant at the five percent level when tested by the "t" procedure. In two programs of wheat allotment retirement, the theoretical efficiency was lower than the efficiency computed from farmers' stated requirement. In both cases the differences in mean efficiencies given by the two methods of analysis are significant at the five percent level using a "t" test.

The individual farms participating in each program under the "theoretical" column of Table XXX are, for the most part, not the same individual farms participating under the "farmer response" column. In each method of analysis farms were included in each program in decreasing order of the farms' efficiencies. The ranking achieved in one method of analysis in no way affects the ranking in the other method. For example, the ten-year wheat allotment program (wheat

$2.00) contained 59 farms at the nine percent retirement level in the theoretical analysis. The analysis of farmers' responses for this program had 67 farms. There were only two farms common to both methods at the nine percent retirement level.

Why did some of the best ranked programs under the theoretical analysis fail to make the grade under the farmers' stated payment requirements analysis? In the case of Government purchase of cropland, whether it be of the entire cropland unit or of the poorest land category, the overwhelming number of farmers disapproved of this type of action by the Government. Only four percent of the farmers polled approved of this approach.

Programs designed to retire only a portion of each farm -- in this case the poorest cropland category -- failed because of the nature of the typical cropping system followed in the sample area. The average sample farm consisted of 234 acres of cropland and held 196 acres of bases and allotments. Some bases and allotments -- feed grain and cotton -- allowed and/or required a percentage of diversion in the year the sample was taken. Some farmers did not use their full allotments and bases due to use of the fallow practice, weather conditions, conservation considerations, and other factors. The result was a sample average per farm of 164 acres in wheat, feed grains of all types, and cotton; 17 acres in hay and pasture; and 53 acres of fallow. Those 279 farms which designated a poorest cropland category averaged 59 acres of poorest land per farm. For the most part, fallow, hay, and pasture fall into this segment of the farm. The gross value of crop production on these acreages is only $14.80 per acre. Thus, part-farm programs, which result only in the retirement of each farm's poorest

land, include a considerable proportion of fallow land and remove a relatively small amount of crop production per acre.

Why did the two best farmer ranked programs -- wheat allotment retirement for ten years or one year -- have a higher efficiency than their theoretical computed efficiency? It could be assumed that, since a theoretical efficiency is based on the minimum payment necessary to secure the farm's participation, theoretical efficiencies would always be higher than those obtained in actual cases. The assumption would continue that the farmer would likely ask a little more than his theoretically computed net income to forego gambling on the possibility of a better crop or a better price. In the case of three of four programs ranked by farmers, the efficiency based on "bids" by farmers was equal to or higher than the theoretical program efficiency. In these three programs, the farmer required less than or only as much as his theoretically computed net income. It appears that in the one to ten-year span of these programs, farmers were willing to reduce their net income somewhat to eliminate variability in their yearly income stream. It is also possible that the farmers' estimates of costs and returns differed from those used in the theoretical analysis.

The cropping easement program ranked the lowest of the four effective programs in the farmer analysis. This is in contrast to its number two ranking in the theoretical analysis. Likewise, the theoretical efficiency value for this program was higher than the farmer computed efficiency. Farmers are accustomed to making program participation decisions based on the annual payment offered. In the easement program, they were told they would receive one lump cash sum

in the form of a non-recourse, non-interest loan. In effect, their annual payment would become the amount this loan would earn while in their control. It was difficult for farmers, in the course of the interview, to arrive at an accurate answer for this unfamiliar program. Perhaps due to this situation, over 70 percent of those farms in the sample would not be offered for participation in the program.

Three programs had sufficient built-in disadvantages to cause their rejection by both methods of analysis. Farms with feed grain bases numbered 219, the smallest subset in the sample of 421. The strong role played by sorghum in on-the-farm livestock programs caused farmers to be reluctant about retiring this acreage. Only slightly more than 50 percent of feed grain base holders would cite a payment requirement for participation. The average size of a feed grain base was 52 acres for those farms that had such a base. In combination, the factors of small numbers of bases, small base sizes and farmers' reluctance to change their livestock program resulted in a very low potential effectiveness for a feed grain retirement program in the geographic area of this sample.

The program to retire the poorest cropland category and allow it to be grazed was also prejudiced by several existing conditions. If the farm was not presently supporting a livestock enterprise, the acreage affected by this program was usually too small to justify the cost of establishing such an enterprise. For these farms, the program was no better than the poorest cropland retirement program without the grazing privilege. If the poorest land retired could be productively used for grazing, in most cases the returns from grass were equal to the returns from wheat or feed grains production and little overall

reduction in the value of crop production took place. Failure of farmers to distinguish adequately between the profitability of marginal and better land may also have limited their willingness to retire poor land. It is also possible that some farmers recognized that a cost-effective program must reduce production and they were unwilling to retire poor land that would not contribute to this objective.

Chapter VI will follow with a discussion of the conclusions and their implications drawn from the comparisons outlined above.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The overall objective of this study is to analyze the cost-effectiveness of a variety of Government programs to control farm production. The large number of possible programs are not equally efficient in use of public funds to reduce production and raise farm income. Results of this study are intended to provide policy makers with guidelines useful in constructing a coordinated and efficient supply control program for agriculture.

Procedure

Two separate, but somewhat complementary, methods of analysis are used in this study. The first is a theoretical analysis based on estimated costs and returns for each separate farming unit in the sample. It is assumed that each farming unit will participate when the program payment equals or exceeds normal returns over variable costs. The second part is based on payments which each farm manager (either owner-operators or tenant-operators) stated are necessary to obtain his farm's participation. The various program alternatives studied are compared within each type of analysis and also between the two analyses.

With both forms of analysis, the assumption of perfect price discrimination is used to construct a land supply schedule for each

program. First, a payment requirement is established for each farm as specified by the assumed program. In the theoretical analysis, this is computed as the expected returns minus the variable costs. In the second analysis, it is the farmer's stated requirement. Next, the ratio of value of production removed per dollar of payment is computed for each farm. For each program alternative, all farms are ranked from highest to lowest on the basis of this ratio. As the supply schedule is constructed for each program, the farms are drawn from the ranked list, with the result that farms with the highest program efficiency ratio are included first. The supply schedule is completed when all farms on the list have been included or when the required level of land retirement has been reached.

In both analyses, the amount of cropland acreage allowed to be retired from each county is limited to 30 percent of the county sample cropland base. Those farms that would not be offered for participation in the farmer stated requirement method of analysis are given an efficiency ratio value of zero and thus never enter the supply schedule for that program alternative. All farms are considered eligible for participation in the theoretical analysis.

Results

A successful and efficient program is defined in this study as having the following attributes. It removes more than a dollar of crop production per dollar of program payment. It attracts sufficient participation to allow significant reductions in farm production. How a given program alternative scores with respect to each of these attributes depends on such factors as its time span, the type of land

or crop it is designed to retire, its popularity with farmers and the size of the potential acreage pool that is eligible for participation.

Identifying successful and efficient programs is only part of the task. Identifying programs which are likely to be poorly suited to the problem of supply control is also important. Also important is the efficiency of one relative to another of the various successful programs.

Both the theoretical and the empirical analyses described earlier have been used by a number of researchers to measure the effectiveness of various programs in different situations. It has generally been assumed that the choice of analytical method has little effect on the results, the choice being largely based on the type of data available. This study shows to what extent the two methods of analysis are complimentary and where they might be contradictory.

The best programs in the theoretical analysis are those which retire whole farms from crop production. In decreasing order of efficiency, these whole-farm programs are Government purchase of cropland, cropping easements by means of Government loans, and ten-year retirement. The next best group of programs theoretically are those which retire the poorest cropland segment on each farm. These part-farm programs in decreasing order of efficiency are cropping easements, ten-year retirement, Government land purchase, and one-year retirement.

The theoretical analysis identifies as unsuccessful a program which would retire the feed grain base and an equivalent cropland acreage for one or ten years and a program to retire for ten years the poorest cropland on each farm, but allow it to be grazed. In the feed grain retirement case, there is an insufficient acreage of profitable feed grain production to effect a significant reduction in crop output.

The retirement of poorest cropland with grazing allowed fails because in a considerable number of instances the value of grazing would be larger than the present value of crop production.

Of the 12 alternative programs considered in this study, only four remain successful in the analysis of farmers' stated payment requirements. The two most efficient programs are part-farm retirement plans. In decreasing order of efficiency, the best part-farm programs are ten-year retirement of wheat allotments with an equivalent acreage of cropland diverted to soil conserving uses and the same program with a one year life. Next in order of efficiency are two whole-farm programs: ten-year farm retirement and cropping easements.

All other programs considered are determined to be inefficient by the analysis of farmers' responses. The Government land purchase program was eliminated because of a low level of indicated participation. In general, part-farm programs directed only against the poorest cropland were eliminated on the basis of low indicated participation and payment requirements in excess of present value of production.

A comparison of the results of the two analyses leads to a third set of conclusions. Farmers have a tendency to overprice their poorest land and its crop production and underprice the most productive and valuable land. This phenomena can be seen in the number of large extensively cropped farms participating in the successful programs of the farmer response analysis. It can also be viewed in the large number of farms offered for participation in poorest cropland retirement programs, but rejected because payment requirements were in excess of value of production.

If all other factors are held constant, there seems to be little difference in efficiency between a one-year program and a ten-year program. The theoretical analysis gives a more favorable efficiency ratio to the longer-term program. The farmer response analysis indicates a higher percentage of farms willing to participate in a one-year program. More costs are variable, therefore efficiency should be higher with long term contracts. But this tendency may have been offset by farmer expectations for higher prices engendered by the "feed the world" psychology of the mid 1960's.

A given program may be more or less efficient and successful when viewed in light of the farmers' responses than would be indicated by a purely theoretical analysis based on returns over variable costs. It is apparent that farmers attach some value to stability of income when a program also is consistent with their beliefs and goals. Likewise, certain programs are never subjected to an objective economic evaluation by farmers because the program is unacceptable on philosophical grounds.

Implications

Not all of the possible programs to control crop production are included in this study. In addition to programs different from those in this study, it is possible to modify or combine the 12 programs presented here into numerous other program alternatives. The following generalizations are offered in the hope they will be helpful in situations not specifically covered by the programs studied.

In no case does the farmer response analysis rate a program as efficient or successful that is not similarly rated by the theoretical

analysis. Thus, it would seem that approval by means of the theoretical analysis is a necessary, if not sufficient, condition for success. Since the theoretical method of analysis is usually less expensive and easier to perform than the farmer response analysis, this approach can be a useful screening device to identify those program alternatives worthy of more intensive analysis.

A program must be directed toward a base of adequate size to be successful in a given geographic area. It might be hypothesized that a feed grain diversion program would be quite popular in Oklahoma and other southern plains states since feed grain is not the chief cash crop here. The tendency revealed by this study indicates that programs directed against minor crops are more likely to be ignored than popular. In a similar manner, part-farm programs affecting only a small acreage of each farm are considered more of a nuisance than a relevant alternative in the cropping system. Thus, a successful program is characterized as one which has a large base of eligible participants, where the base is large both in terms of numbers of farming units and acreage.

A successful and efficient program must be directed toward something that is worth retiring. This criterion requires a knowledge of the prevailing cropping systems and also a good estimate of the cropping system that would prevail if present programs were eliminated. By way of example is the case of retiring the poorest cropland category on each farm -- part-farm retirement on a small portion of the cropland base. This land is already in fallow or crops of low value for the most part. Retiring it for a payment, particularly if grazing is in turn allowed, accomplishes little. Neither is maximum efficiency obtained by directing a program against bases or allotments that are

already grossly underutilized. Only slightly more than 60 percent of the feed grain base is actually planted to feed grain in this study. Less than 70 percent of the cotton allotment is planted. In both cases, these percentages would be lower if the farmer did not have to plant the crop to receive the production subsidy. It is instructive that the most successful and efficient program revealed in the farmer response analysis is wheat allotment retirement, a crop of high value per acre and an allotment that is over 90 percent planted.

For a program to be readily accepted by farmers, it must be familiar -- or at least simple. The more extensive the "may" and "may not" list, the less participation it will attract. The more difficult the annual cash value of the program payment is to compute, the more payment farmers will require to participate. The cropping easement program is diminished in acceptance because it is unheard of by farmers. It is diminished in efficiency because farmers are accustomed to receiving an annual payment for program participation rather than a once and for all loan.

It is conceivable that the present system of voluntary program payment has at least encouraged the tendency of farmers to overprice poor land and underprice their best land. Present programs provide for payment on the basis of projected yield for each farm. The mechanics by which these projected yields are assigned to individual farms, however, often understates the real differences among farms. Once the projected yield is assigned to the farm, it becomes the average for all acreage of that crop on the farm. When a farmer diverts part of a crop, he tries to divert the poorest land and collect for the average. Several alternative methods might be more effective

in matching the payment for each unit of production to its marginal revenue. One commonly discussed method is allowing each farmer to offer units of production through a sealed bid. The Government would then rank all bids received from best to least efficiency and accept sufficient bids to achieve the desired reduction in crop production.

Limitations

Part of the contradiction between the results of the theoretical analysis and the farmer response analysis may be caused by the variable cost assumptions. The theoretical assumption contains arbitrary decisions about what costs are variable for each program alternative. Arbitrary assumptions are also made about the amount of variable costs for each of the four counties studied. Farmers may divide their costs, particularly their own labor, between fixed and variable according to different criteria than those commonly used by researchers. Cost data used for farms in each of the four counties may not be accurate for a significant number of those interviewed. This problem is and will remain one of the major limitations of theoretical analysis of farm programs.

Another limitation of the theoretical analysis is the problem of production units with no production or with variable costs in excess of the value of production. It is impossible to compute a payment that would induce their participation. Theoretically, they should make the transition from crops to grazing or other use for little or no Government payment. Hence program efficiency should be high. The usual solution is to assume that land not now producing crops will not be productive under the new program. This assumption rests on a

weak foundation. It is a limitation of theoretical analysis.

There are several sources of possible upward bias in the program payment requirements quoted by farmers in this study. Some respondents were suspicious of a possible connection between the questionnaire and the operation of the ASCS programs. To be safe from possible payment limitations that might be imposed on them in the future, they inflated their answers. Another influential factor at the time the interviews were conducted was the "feed the world" optimism of the mid 1960's. This expected rapid increase in demand for U. S. farm production, with attendant increases in farm commodity price, caused some to look unfavorably on production controls. These factors may cause the analysis of farmers' responses to give lower efficiency values than the theoretical analysis. The efficiency of long-term programs may have been biased downward by farmer expectations of higher prices in the future.

The proper evaluation of fallow and uncultivated cropland is a problem with both methods of analysis. In those cases where fallow is a part of the cropping rotation, fallow land has a return in the amount of yield increase over continuous cropping. In other cases some land is continuously uncultivated and other land continuously cropped. Land continuously uncultivated makes no contribution to the value of production. The available data did not permit an accurate assessment of the value of fallow land on farms in this study.

Finally, there are the possible discrepancies between the goals of program efficiency, social efficiency, and distributive justice. Program efficiency is defined as removing the maximum amount of crop production for each dollar of program payment. Social efficiency is

defined as retiring those farms or parts of farms which produce at the highest per unit cost and thereby increasing the average efficiency of those remaining in production. Distributive justice refers to the case where each owner, manager, and worker receives an adequate share of the Nation's wealth.

If the theoretical analysis is accurate, it results in both the maximization of program and social efficiency given that land resources are in excess supply. The analysis of farmers' responses appears to indicate that maximization of program efficiency will not necessarily lend to maximum social efficiency. The analysis overlooks the problem of those who have large requirements for distributive justice, but little in the way of productive resources -- such as land -- that qualify for program participation. The most efficient control programs are unlikely to result in an efficient solution to the problem of distributive justice. However, to the extent that the use of cost-effective supply control programs meets the needs of commercial farmers and free tax dollars to help marginal farmers in other ways, there is a complementarity between program efficiency and distributive justice.

The farmer response analysis is believed to give the most accurate measure of a program's efficiency from the standpoint of supply control. Some alternatives were not investigated in this study but are worthy of consideration. An efficient supply control program could be supplemented with special inducements to retire marginal cropland, thereby improving the effect on social efficiency. Production control could be achieved through expenditures to divert the human resource from agriculture into other uses, thereby promoting distributive justice. Policy makers must decide whether the goals of social efficiency and

distributive justice are best satisfied by chosing control programs of lesser efficiency or by use of programs directed specifically to these concerns.

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APPENDIX A

LETTER MAILED WITH QUESTIONNAIRE

Your help is needed in a research project being conducted by Oklahoma State University to improve government farm programs. This study is a cooperative project with the U. S. Department of Agriculture and is under the supervision of Dr. Luther Tweeten and myself.

Four counties -- Grant, Harper, Texas, and Tillman -- have been selected from the important agricultural areas of Oklahoma. In these four counties, you and 249 other wheat and feed grain producers will be contacted. The purpose of the interview will be to get your reaction to past programs and to obtain suggestions on possible new wheat and feed grain programs. Only one out of each 14 farmers in your county will be contacted, so your opinion is very important. You will want your point of view to be represented.

The purpose of the survey is to get accurate information about what you prefer and what your reaction is toward different possible programs. The identity of each cooperator will remain confidential. No individual farm data will be revealed to the ASCS or any other agency.

We are enclosing a questionnaire which we ask you to fill out at your convenience. It will probably take less than an hour. One of us will call you within the next week to arrange an appointment to pick up the completed questionnaire. At the time of our visit with you, we will have some further questions dealing with your opinion about some proposed new farm programs. By answering the enclosed questions now, the length of our interview with you will be held to a minimum.

Sincerely,

A. Barry Carr
Agricultural Economist

SAMPLE QUESTIONNAIRE

OKLAHOMA AGRICULTURAL EXPERIMENT STATION
In Cooperation with
UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE

STUDY OF GOVERNMENT FARM PROGRAMS

Part 1

Your name (farm operator) _____

Your address _____

Your telephone number _____

Your age _____

Are you married? Yes /__/ No /__/

Number of children at home under 12 ____; 13 to 20 ____; over 20 ____

Do you farm full time /__/ or part time /__/

Do you plan to farm for the next five years? Yes /__/ No /__/

Do you share the management of this farm with a partner? Yes /__/ No /__/

How many years have you been farming _____

Circle the number which indicates the last year of school you have finished: Elementary: 1, 2, 3, 4, 5, 6, 7, 8;
High School: 1, 2, 3, 4; College: 1, 2, 3, 4.

We would like to know which farm organizations you have been a member of any time during the last five years. In column 1, check the organizations to which you have belonged. In column 2, check the organizations in which you have been an officer. In columns 3, 4, and 5, check the column which best indicates how often you attended the meetings.

Organization	Member (1)	Officer (2)	Meeting Attendance		
			Often (3)	Occasionally (4)	Never or Seldom (5)
Grange					
Farmers Union					
Farm Bureau					
Grain Co-op Board					
SCS District Board					
FHA Committee					
ASCS Committee					
Wheat Growers' Assoc.					
Cattlemen's Assoc.					
Other (write in)					

We would like your opinion as to what a wheat and feed grain program should accomplish. Indicate whether you agree or disagree with each statement by circling one of the numbers from 1 to 5 to the left of each statement that corresponds with your attitude.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE	
1	2	3	4	5	Keep farmer's cost of producing wheat and feed grains low.
1	2	3	4	5	Keep wheat and feed grain prices at parity.
1	2	3	4	5	Keep bread and meat prices low.
1	2	3	4	5	Assure wheat and feed grains producers parity income.
1	2	3	4	5	Give farmers freedom to produce and market as much as they wish.
1	2	3	4	5	Keep the government cost of programs low.
1	2	3	4	5	Other (fill in) _____.

What do you like best about present government farm programs?

_____

_____

_____

What are your main criticisms of present government farm programs?

_____

_____

_____

What changes would you like to see in the way programs are administered by the local ASCS?

_____

_____

_____

The following programs have been proposed as ways to deal with the farm problem. If the programs could be made to work, would you approve or disapprove? Circle one of the numbers from 1 to 5 to the left of each statement that most nearly expresses your attitude.

STRONGLY APPROVE	APPROVE	UNDECIDED	DISAPPROVE	STRONGLY DISAPPROVE	
1	2	3	4	5	An organization of farmers themselves (independent of the government) would control production so as to raise farm prices and income.
1	2	3	4	5	A farmer would submit sealed bids to the ASCS showing the payment required for him to divert land from production. The ASCS would accept those bids from farmers that would remove the most production per dollar spent by the government.
1	2	3	4	5	The government would buy whole farms and combine several farms to be used for public recreation or leased for grazing.
1	2	3	4	5	The government would lease the rights to grow wheat crops and feed grains on a farm. Then this farm could no longer grow wheat or feed grains for the life of the lease. The owner could use the land for any other purpose, including the production of other crops.
1	2	3	4	5	Wheat and feed grain allotments could be bought and sold among farmers, so that allotments would eventually end up in the hands of those who would make the best use of them.
1	2	3	4	5	All government controls and price supports would be terminated, and the farm economy would be on a free market.
1	2	3	4	5	Wheat and feed grains would be under a voluntary acreage diversion program. Each individual farmer would be free to decide each year if he wants to receive payments to divert land from his crop allotment and be eligible for price supports.
1	2	3	4	5	Wheat and feed grains would be subject to mandatory acreage controls of the type used for wheat before 1964. All farmers would be required to comply with allotments if approved in a national referendum.

What would you consider to be a fair or equitable price for wheat if your production costs stay at their present level? _____ $ per bu.

Do you think the Government should support the price of wheat?
Yes /__/ No /__/ If YES:

At what level should the Government support the price of wheat?
_____ $ per bu.

What do you expect the average price to be for the wheat you harvest in 1968? _____ $ per bu.

What do you expect the average price to be for the wheat you harvest 5 years from now? _____ $ per bu.

What would you consider to be a fair or equitable price for grain sorghum if your production costs stay at their present level?
_____ $ per cwt.

Do you think the Government should support the price of grain sorghum?
Yes /__/ No /__/ If YES:

At what level should the Government support the price of grain sorghum?
_____ $ per cwt.

If price projections indicate that the price of wheat would be substantially below the fair price given in 03.34, would you favor a free market? Yes /__/ No /__/ Undecided /__/

If price projections indicate that the price of grain sorghum would be substantially below the fair price given in 03.38, would you favor a free market? Yes /__/ No /__/ Undecided /__/

Given the acreage of cropland that you have in 1967, how many acres of wheat and grain sorghum would you plant for harvest if we had no acreage restrictions or price supports, and prices were as follows: (Prices of livestock and all other feed grains remain at present levels.)

		Acres I would plant with no control	
Wheat ($ per bu.)	Grain Sorghum ($ per cwt.)	Wheat	Grain Sorghum
1.00	1.00	_____	_____
1.50	1.50	_____	_____
2.00	2.00	_____	_____
2.50	2.50	_____	_____

Date_____
Enumerator_____
Farm No._____
County_____

OKLAHOMA AGRICULTURAL EXPERIMENT STATION

In Cooperation with

UNITED STATES DEPARTMENT OF AGRICULTURE

ECONOMIC RESEARCH SERVICE

STUDY OF GOVERNMENT FARM PROGRAMS

Part 2

Name of operator _____

Address of operator _____

Telephone of operator _____

FARM AND PROGRAM INFORMATION, 1967

Item	ASCS Farm Number				Total
Farm land acres					
Crop land acres					
Conserving base acres					
Permitted crop acres					
1967 ALLOTMENT - BASE					
Wheat, acres					
Barley, acres					
Feed grain, acres					
Cotton, acres					
Oat-Rye, acres					
ASCS 1967 PROJECTED YIELD					
Corn, bu.					
Grain sorghum, bu.					
Wheat, bu.					
Cotton, lbs.					
Acres irrigated					

Item	ASCS Farm Number			
Is this farm rented in?				
Cash rent, $ per acre?				
Landlord's share of crop? %				
Landlord's share of expense? Seed, fert., harvest $/acre				
Was this farm in the 1967 wheat program?				
Maximum acres land suitable for wheat?				
Total production if max. acreage planted? bu.				
Was this farm in the 1967 feed gr. program?				
Maximum acres land suitable for gr. sorghum.				
Total production if max. acreage planted to grain sorghum? bu.				
How many acres of wheat were substituted for feed gr. base in '67?				
How many acres of gr. sorg. were substituted for wheat allotment '67?				
How many acres of wheat were substituted for barley base in 1967?				
How many acres of wheat were substituted for oats & rye base in 1967?				

At the time you planted wheat or feed grain for harvest in 1967, were you fully aware of the possibilities of substitution under the present program? Yes / / No / /

What were your reasons for (or for not) using the substitution provision between wheat and feed grains in 1967? _____

_____

USE OF NON-IRRIGATED LAND IN 1967

Show Acreage Harvested Crops

Item	Farm #___ Acres	Farm #___ Acres	Farm #___ Acres	Farm #___ Acres	Total Acres
Corn, grain					
Grain sorghum					
Corn or sorg. forage					
Wheat					
Barley					
Oats					
Rye					
Cotton					
Other crops:					
Tame Hay					
Cropland pastured					
Diverted cropland					
Fallow, idle, failure					
TOTAL DRY CROPLAND					
Total irrigated cropland					
TOTAL CROPLAND					

What would farm land of the type in the farms above sell for in your community?
_____ $ per acre.

SOIL CLASSIFICATION AND YIELDS

The quality and yield potential of soils varies from field to field even on the same farm. Consider the non-irrigated cropland on each farm. Set up one category in which you would include your best cropland. Set up another category which would include your poorest cropland. A third category should be set up to include the land between the best and the poorest. Show the normal dryland yield per planted acre that you would expect for each category if the entire acreage were planted to the indicated crop. For pasture yields show the number of animal units (1 A. U. = 1 cow and calf, or 2 weaned calves) that could be maintained per 100 acres of permanent pasture for 1 full year with no roughage supplement. Show your per acre production costs in each category for the crops indicated. Production costs should include seed, fertilizer, hired labor, chemicals, machinery repairs and fuel, custom harvesting and hauling. Exclude from production costs the operator labor, unpaid family labor and land costs.

Land Category	Acreage of Cropland					Wheat		Gr. Sorghum		Pasture	
	Farm#__	Farm#__	Farm#__	Farm#__	Total	Yield	Cost	Yield	Cost	Yield	Cost
TOTAL						XX	XX	XX	XX	XX	XX

What payment per acre would you require to voluntarily divert from production to soil conserving use the following categories of land for the indicated periods of time. Your present crop base allotments would remain unchanged, but you would have to maintain your present conserving base in addition to the acreage diverted. You would have the choice of what crop acreages were reduced to stay within the permitted crop acreage. Grazing may or may not be permitted.

	1 Year Diversion		10 Year Diversion	
	With Grazing	Without Grazing	With Grazing	Without Grazing
What payment per acre to divert the best category above, $ per acre				
What payment per acre, to divert the poorest category above, $ per acre				

If you diverted the acreage given in 08.07 for one year, how much would your wheat acreage be reduced?
_____ acres

If you diverted the acreage given in 08.08 for one year, how much would your wheat acreage be reduced?
_____ acres

VOLUNTARY PROGRAM ALTERNATIVES

Suppose you have a choice of participating in a wheat program at different levels of diversion from your present 1967 wheat allotment. How many acres would you voluntarily divert to soil conserving use on a one-year basis with the price support loan levels and diversion payment rates shown? The diversion payment would be the ¢ per bu. indicated times your 1967 projected per acre yield. There would be no marketing certificate payment on your production. You would be required to stay within your 1967 wheat allotment, plus any substitution with feed grains, barley, oats, or rye, to be eligible for support loans. The diverted acreage could not be used for grazing.

Loan and Diversion Payment	Acres Diverted From 1967 Wheat Base — ASCS Farm Number				Total
Loan Level $1.25 per bu. Diversion pay. ¢ per bu. on proj. yield 50¢					
75¢					
100¢					
Loan Level $2.00 per bu. Diversion pay. ¢ per bu. on proj. yield 50¢					
75¢					
100¢					
At what diversion payment rate per acre would you divert the entire allotment for 1 year? Loan Level $1.25 per bu.					
Loan Level $2.00 per bu.					

Indicate below the acreage of your 1967 grain sorghum base that you would voluntarily divert for one year under the same conditions as stated in the previous question for wheat. No grazing would be allowed on the diverted acreage.

Loan and Diversion Payment	Acres Diverted From 1967 Sorghum Base ASCS Farm Number				Total
Loan Level $1.25 per cwt. Diversion pay. ¢ per cwt. on proj. yield 50¢					
75¢					
100¢					
Loan Level $2.00 per cwt. Diversion pay. ¢ per cwt. on proj. yield 50¢					
75¢					
100¢					
At what diversion payment rate per acre would you divert the entire allotment for 1 year? Loan Level $1.25 per cwt.					
Loan Level $2.00 per cwt.					

Suppose you are faced with a program that will allow you to voluntarily divert to soil conserving use for 5 to 10 years the indicated base or allotments. You would not be allowed to harvest a crop from the land during the period and would not be allowed to graze. You would be required to maintain your normal conserving base in addition to the allotment or base diverted. You could not grow the crop corresponding to the allotment or base diverted on the participating farm. What payment per acre would you require for the farm that you own?

Allotment or Base and Contract Time	Payment Per Acre ASCS Farm #_____
Wheat Allotment Years 5	
10	
Sorghum Base 5	
10	
All Cropland 5	
10	

Suppose there was a government program that would give you a non-interest, non-recourse loan to remove your cropland from agricultural production. As long as you keep the loan you could not crop the land. You could sell the land, subject to the no-cropping restriction, or you could use it for non-agricultural purposes. Any time you wished to repay the loan without interest you could do so and resume production. If the land were never used for agricultural purposes the loan need never be repaid. In a national emergency of short crop supplies, the government could release the land for cropping on a temporary basis. For the farm that you own, what size loan per acre of cropland would you require to put the entire cropland into retirement?

Grazing Status	$ Per Acre of Cropland To Retire All Cropland ASCS Farm #_____
Grazing permitted	
No grazing permitted	

What loan per acre would you require to retire the indicated category of land that you own listed in question 08.00. Present allotments and bases remain unchanged but you must maintain your present conserving base in addition to the acreage retired. No grazing permitted.

Category of Land	$ Loan Per Acre
Best in 08.00	
Poorest in 08.00	

Suppose the government had a program to raise farm commodity prices and farm income by purchasing land and diverting it from production. Such land would be used for public recreation or leased back for grazing. If offered an adequate price would you consider selling any of the land you own under this arrangement? Yes /__/ No /__/

For the farm that you are the owner, what price per acre would you require to sell the following at the end of the 1967 cropping year? Mineral rights are excluded from the sale.

Items to be Sold	Sale Price in $ Per Acre ASCS Farm #_____
Total farm, buildings, and houses	
Cropland, allotments, and bases only	

What price per acre would you require to sell the indicated category of land that you listed in question 08.00. Your present 1967 allotments and bases would be unchanged, but you must maintain your present conserving base. You may not have sufficient cropland to grow your entire allotment and base.

Category of Land	Sale Price in $ Per Acre
Best land in 08.00	
Poorest land in 08.00	

About how many days did you work off the farm in 1966? _____ days

Check the principal source of your off farm income in 1966, if any.

Property rental /__/
Stocks, bonds, saving accts. /__/
Social security or pension /__/
Custom work /__/
Salary job or wage /__/
Business /__/
Other (_____) /__/

Check the category which would include the total off farm income in 1966 of yourself and the dependent members of your family living with you.

None /__/ $1000 - 1999 /__/
$1 - 499 /__/ $2000 - 4999 /__/
$500 - 999 /__/ Over $5000 /__/

If you were to quit farming, how would you rate your possibilities for income in a non-farm job as compared to the income you have been making from farming? Better off /__/ Worse off /__/ Same /__/

In 1966, check the category which includes your total gross farm income from all farming operations, including your government payments.

Under $2500 /__/ $10,000 - 19,000 /__/
$2500 - 4999 /__/ $20,000 - 39,000 /__/
$5000 - 9999 /__/ Over $40,000 /__/

In 1966, check the category which includes your net farm income from all farming operations, as defined on Schedule F of your federal income tax return.

Under $0 /__/ $3000 - 6999 /__/
$0 - 999 /__/ Over $7000 /__/
$1000 - 2999 /__/

How many man-weeks did you work on the farm in 1966? _____

How many man-weeks of unpaid family labor did you use on the farm in 1966? _____

How many man-weeks of hired labor did you use on the farm in 1966? _____

The following statements are sometimes made about government farm policy and farming in general. Indicate whether you agree or disagree with each statement by circling one of the numbers from 1 to 5 to the left of each statement.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE	
1	2	3	4	5	The government would pay farmers for long term (10 or 20 years) land retirement. There would be no acreage controls on specific crops, but the amount of cropland available for farming would be reduced by the amount of land retired.
1	2	3	4	5	Continue the present wheat and feed grain programs with price supports loan and marketing certificates for wheat.
1	2	3	4	5	The government should support farm prices, but it shouldn't try to tell a farmer what and how much to produce.
1	2	3	4	5	Farmers could easily organize themselves to control production and raise prices.
1	2	3	4	5	The federal government should not get involved in such projects as electric power and housing.
1	2	3	4	5	Instead of raising taxes, Congress should try to reduce federal spending.
1	2	3	4	5	The federal government ought to see to it that anyone who wants to work can find a job.
1	2	3	4	5	Government relief programs have gotten to be too large.
1	2	3	4	5	The federal government should do more to help small towns and cities build the schools they need.
1	2	3	4	5	One job of government is to see that people are free to run their business as they please.
1	2	3	4	5	Present government farm programs are contrary to the free enterprise system.

1	2	3	4	5	Keeping up on the latest feeding and fertilizing practices is more important than keeping up on farm programs.
1	2	3	4	5	The government should see that <u>every</u> farmer makes a decent living.
1	2	3	4	5	A family is better off to stay on the farm even though there is a higher paying job available in town.
1	2	3	4	5	It's important for the government to provide an opportunity to farm for all boys who want to farm.

APPENDIX B

TABLE XXXI

THEORETICAL RANKING OF GOVERNMENT PURCHASE OF ALL CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
							Wheat $2.00							
3	0	111	2,533	106	129	18	145	273	2,221	333	25	29.4	18.8	252
6	219	132	4,746	171	289	108	367	710	3,949	770	152	33.3	20.5	244
9	266	183	7,060	243	525	174	580	988	5,936	1,056	260	31.3	21.1	261
12	266	291	9,384	420	634	297	844	1,239	8,026	1,306	442	30.5	21.6	259
15	286	291	11,437	758	677	401	1,262	1,373	9,869	1,522	582	30.6	22.5	258
18	341	326	13,663	769	774	401	1,710	1,512	11,900	1,747	582	30.9	23.2	258
21	731	326	16,521	789	901	401	1,974	2,099	14,444	2,007	582	30.4	23.1	258
24	877	326	18,336	789	1,005	401	2,318	2,426	16,059	2,184	582	31.1	23.4	258
							Wheat $1.25							
3	219	20	1,811	96	158	37	365	664	1,738	81	55	32.1	19.7	267
6	219	141	4,274	171	287	172	624	757	3,885	557	253	31.6	20.0	270
9	334	153	6,402	191	630	300	824	1,007	5,553	987	436	31.4	20.9	271
12	531	355	8,015	419	859	529	1,188	1,195	7,217	1,195	816	32.1	21.7	272
15	837	370	10,032	485	951	542	1,549	1,689	9,083	1,329	830	33.3	22.7	271
18	1,357	405	12,558	496	1,117	542	1,758	2,402	11,479	1,586	830	33.5	22.4	271
21	1,357	405	14,565	516	1,170	542	2,227	2,468	13,259	1,765	830	32.6	22.8	271
24	1,550	435	16,908	516	1,319	542	2,414	2,744	15,294	2,056	830	31.9	23.3	271

TABLE XXXII

THEORETICAL RANKING OF GOVERNMENT PURCHASE OF POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
3	521	85	1,225	102	356	0	664
6	823	184	2,437	239	660	0	1,558
9	894	266	3,565	586	1,038	0	2,526
			Wheat $1.25				
3	684	101	770	224	496	0	685
6	797	212	2,162	399	829	0	1,452

TABLE XXXIII

THEORETICAL RANKING OF CROPPING EASEMENT ON ALL CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
							Wheat $2.00							
3	56	62	496	30	260	497	1,335	287	910	293	714	36.2	26.7	282
6	296	108	2,368	274	305	760	2,262	693	2,700	414	1,136	37.5	23.9	285
9	646	108	3,238	330	575	1,023	2,882	1,108	3,881	500	1,490	38.0	23.6	284
12	872	399	4,765	352	799	1,023	3,730	1,564	5,842	553	1,490	35.8	22.6	284
15	900	602	6,754	487	1,006	1,023	4,114	2,070	7,596	731	1,490	34.4	22.6	284
18	962	742	8,621	556	1,302	1,023	4,421	2,546	9,482	954	1,490	33.6	21.9	284
21	1,222	1,052	10,175	652	1,366	1,023	5,309	3,169	11,535	992	1,490	32.8	21.7	284
24	1,355	1,205	11,589	793	1,709	1,023	6,003	3,579	13,524	1,186	1,490	32.4	21.6	284
							Wheat $1.25							
3	38	22	1,651	14	58	134	1,109	304	1,873	159	220	37.4	21.4	291
6	38	63	3,187	14	136	328	2,311	411	3,606	472	521	36.3	23.0	286
9	182	153	4,472	254	276	686	2,969	755	4,820	536	1,014	37.0	23.7	283
12	182	253	6,285	264	431	803	3,565	992	6,522	824	1,172	35.3	23.5	281
15	217	513	8,358	312	671	803	3,943	1,442	8,453	984	1,172	33.6	23.0	281
18	259	590	10,596	505	709	803	4,388	1,652	10,567	1,144	1,172	33.3	22.6	281
21	459	709	12,293	610	808	803	5,133	1,997	12,568	1,338	1,172	33.4	22.7	281
24	525	822	14,568	681	910	803	5,438	2,320	14,565	1,705	1,172	32.7	22.8	281

TABLE XXXIV

THEORETICAL RANKING OF CROPPING EASEMENT ON POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
3	60	201	718	491	738	0	757
6	715	362	1,521	646	1,190	0	1,492
9	883	362	3,007	666	1,252	0	2,736
12	944	410	3,723	666	2,017	0	4,090
			Wheat $1.25				
3	45	113	935	432	600	0	929
6	184	228	2,125	646	780	0	1,945
9	735	286	2,942	666	1,189	0	3,031

TABLE XXXV

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF ALL CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
						Wheat $2.00								
3	56	171	428	30	260	479	1,584	331	1,075	266	685	34.4	25.0	281
6	296	217	1,840	274	358	790	2,286	736	2,357	422	1,183	36.6	25.4	283
9	296	217	3,180	330	655	1,028	2,958	868	3,772	468	1,503	36.6	24.2	285
12	806	362	4,474	350	705	1,028	3,917	1,419	5,592	521	1,503	36.8	22.8	285
15	885	613	6,422	398	1,122	1,028	4,421	2,030	7,665	717	1,503	33.7	22.0	285
18	920	851	8,212	556	1,382	1,028	4,761	2,475	9,389	911	1,503	33.4	22.0	285
21	1,162	918	10,128	716	1,382	1,028	5,403	2,866	11,485	956	1,503	33.4	21.6	285
24	1,354	1,221	11,462	751	1,512	1,028	6,433	3,448	13,585	1,166	1,503	32.4	21.6	285
						Wheat $1.25								
3	0	109	1,583	14	44	116	1,164	312	1,844	129	191	36.2	20.9	298
6	38	177	2,525	20	146	356	2,436	483	3,230	430	568	35.0	23.0	286
9	38	232	4,217	130	322	677	3,208	723	4,769	587	1,001	35.1	22.9	284
12	182	287	6,009	287	481	796	3,823	1,001	6,542	740	1,171	34.8	23.3	284
15	217	608	8,042	335	638	796	4,200	1,460	8,424	927	1,171	33.3	23.0	284
18	217	723	10,131	528	777	796	4,522	1,651	10,395	1,030	1,171	32.7	22.6	284
21	259	845	12,278	702	824	796	4,996	1,844	12,475	1,407	1,171	32.8	23.0	284
24	525	894	14,171	704	936	796	5,646	2,300	14,476	1,621	1,171	32.8	22.9	284

TABLE XXXVI

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
3	60	333	536	391	726	0	933
6	715	409	1,318	725	1,134	0	1,577
9	883	494	2,805	745	1,229	0	2,750
12	944	517	3,705	745	1,763	0	4,237
			Wheat $1.25				
3	15	272	729	492	573	0	904
6	102	418	1,985	725	887	0	1,788
9	641	464	2,893	745	1,009	0	3,105
12	944	542	3,501	745	1,873	0	4,203

TABLE XXXVII

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF POOREST CROPLAND WITH GRAZING PERMITTED BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
3	514	111	982	244	444	0	717
6	842	242	2,390	413	708	0	1,356
			Wheat $1.25				
3	640	153	747	378	585	0	486

TABLE XXXVIII

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Wheat Acreage	Projected Wheat Yield
	Wheat $2.00	
3	2,357	22.5
6	5,582	21.9
9	9,103	22.8
12	12,143	23.0
15	15,117	23.4
18	18,288	23.4
21	21,026	23.1
24	24,002	22.7
	Wheat $1.25	
3	2,929	22.6
6	5,922	22.0
9	8,825	22.9
12	11,792	23.0
15	14,744	23.4
18	17,855	23.4
21	20,805	23.1
24	23,684	22.7

TABLE XXXIX

THEORETICAL RANKING OF TEN-YEAR RETIREMENT OF FEED GRAIN BASES BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Grain Sorghum Acreage	Forage Sorghum Acreage	Projected Sorghum Yield
3	682	1,786	28.7
6	2,989	1,943	31.0

TABLE XL

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF POOREST CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
3	42	301	591	465	696	0	848
6	199	448	1,821	725	9,959	0	1,781
9	883	494	2,898	745	1,146	0	2,719
12	944	542	3,773	745	1,696	0	4,236
			Wheat $1.25				
3	15	272	836	374	571	0	900
6	60	418	2,074	687	862	0	1,816
9	306	476	3,195	745	1,021	0	3,172
12	944	542	3,663	745	1,769	0	4,221

TABLE XLI

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Wheat Acreage	Projected Wheat Yield
	Wheat $2.00	
3	2,326	22.2
6	5,583	22.0
9	9,194	21.3
12	12,138	21.7
15	15,155	22.6
18	18,193	22.9
21	21,117	22.8
24	24,462	22.8
	Wheat $1.25	
3	2,308	22.3
6	5,565	22.0
9	9,194	22.8
12	12,120	22.8
15	15,260	23.4
18	18,175	23.7
21	21,099	23.4
24	24,444	23.3

TABLE XLII

THEORETICAL RANKING OF ONE-YEAR RETIREMENT OF FEED GRAIN BASES BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Grain Sorghum Acreage	Forage Sorghum Acreage	Projected Sorghum Yield
3	394	1,942	28.8
6	2,579	2,274	30.5

APPENDIX C

TABLE XLIII

INDICATED RESPONSE TO GOVERNMENT PURCHASE OF ENTIRE CROPLAND

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
							Wheat $2.00							
3	0	70	2,410	11	13	116	360	201	2,165	464	19	27.2	28.2	245
							Wheat $1.25							
3	0	70	2,216	11	13	116	360	201	2,033	402	19	27.2	28.4	245

TABLE XLIV

INDICATED RESPONSE TO GOVERNMENT PURCHASE OF POOREST CROPLAND

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
0.1	0	0	82	0	0	0	50
			Wheat $1.25				
0.1	0	0	79	0	0	0	50

TABLE XLV

INDICATED RESPONSE TO CROPPING EASEMENT ON ENTIRE CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
							Wheat $2.00							
3	219	0	1,961	0	72	0	659	265	1,836	132	0	37.7	19.9	0
6	219	85	4,197	0	112	13	1,312	482	3,934	322	14	34.2	20.4	220
9	249	179	6,515	274	192	26	1,524	663	6,171	453	33	33.2	23.2	234
12	434	279	8,505	274	758	26	2,034	1,292	8,325	796	33	31.7	22.9	234
15	483	299	10,575	294	906	26	2,219	1,404	10,148	1,086	33	32.0	24.1	234
							Wheat $1.25							
3	219	0	1,915	0	72	0	640	265	1,790	132	0	37.7	19.9	0
6	219	171	4,098	0	112	0	1,285	507	3,871	286	0	33.7	20.2	0
9	434	211	5,893	274	692	13	1,699	1,102	6,027	371	14	32.6	22.0	220
12	434	279	8,204	274	781	26	2,028	1,263	8,112	747	33	32.0	23.0	234

TABLE XLVI

INDICATED RESPONSE TO CROPPING EASEMENT ON POOREST CROPLAND

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
0.2	0	0	115	20	29	0	47
			Wheat $1.25				
0.1	0	0	45	20	29	0	0

TABLE XLVII

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF ENTIRE CROPLAND BY THREE PERCENT LAND INCREMENTS

Percent of all Cropland	Use of Land in 1967, Acres							Allotments and Bases, Acres				Projected Yields		
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow	Feed Grain	Wheat	Barley Oats, Rye	Cotton	Sorghum	Wheat	Cotton
							Wheat $2.00							
3	421	18	1,851	91	186	152	443	550	1,804	122	221	33.1	23.6	292
6	497	103	3,868	276	266	197	710	807	3,688	258	295	32.0	24.0	267
9	497	178	5,829	461	320	256	907	971	5,462	516	388	31.2	24.4	241
12	515	178	8,582	527	493	339	1,225	1,153	7,571	1,185	505	31.0	24.2	245
15	552	222	10,839	724	689	394	1,470	1,256	9,645	1,548	577	31.2	25.5	247
18	618	284	12,913	778	937	477	1,756	1,510	11,367	1,878	703	31.1	25.8	253
21	704	305	14,925	778	1,000	582	2,440	1,714	13,264	2,040	836	30.9	25.4	257
24	1,235	325	16,434	820	1,177	741	2,952	2,229	14,960	2,085	1,046	32.2	24.8	260
							Wheat $1.25							
3	485	10	1,430	111	210	227	478	566	1,487	0	330	33.2	22.5	264
6	552	118	3,286	349	355	292	759	832	3,252	253	433	31.9	23.7	260
9	552	208	5,491	533	542	389	1,150	1,036	5,306	467	573	31.4	25.1	266
12	681	240	7,880	535	727	422	1,386	1,352	7,169	1,003	621	31.5	24.2	265
15	733	250	9,714	674	830	700	1,795	1,596	8,781	1,277	984	31.9	24.9	268
18	1,067	284	11,834	756	930	700	2,104	2,001	10,636	1,585	984	33.5	25.4	268

TABLE XLVIII

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF POOREST CROPLAND

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
0.6	18	32	306	8	164	0	17
			Wheat $1.25				
0.5	18	32	229	8	164	0	6

TABLE XLIX

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF POOREST CROPLAND WITH GRAZING ALLOWED

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
0.5	0	8	341	6	81	0	31
			Wheat $1.25				
0.4	0	8	238	0	81	0	20

TABLE L

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Wheat Acreage	Projected Wheat Yield
	Wheat $2.00	
3	3,680	21.0
6	7,160	22.0
9	10,462	24.0
12	13,448	24.3
15	16,784	24.3
18	20,331	24.2
21	22,859	23.6
24	25,585	23.3
	Wheat $1.25	
3	3,680	21.3
6	7,055	21.6
9	10,462	24.1
12	13,494	24.4
15	16,913	23.9
18	20,265	24.2

TABLE LI

INDICATED RESPONSE TO TEN-YEAR RETIREMENT OF FEED GRAIN BASES

Percent of All Cropland	Grain Sorghum Acreage	Forage Sorghum Acreage	Projected Sorghum Yield
1.8	1,647	327	35.9

TABLE LII

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF POOREST CROPLAND

Percent of All Cropland	Use of Land in 1967, Acres						
	Grain Sorghum	Forage Sorghum	Wheat	Barley	Hay and Pasture	Cotton	Fallow
			Wheat $2.00				
0.9	18	42	479	114	173	0	34
			Wheat $1.25				
0.8	18	43	372	114	173	0	23

TABLE LIII

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF WHEAT ALLOTMENTS BY THREE PERCENT LAND INCREMENTS

Percent of All Cropland	Wheat Acreage	Projected Wheat Yield
	Wheat $2.00	
3	4,246	24.1
6	7,606	22.8
9	10,968	23.8
12	14,219	24.2
15	17,492	24.8
18	20,832	24.4
21	23,778	24.4
24	27,149	23.6
	Wheat $1.25	
3	3,619	18.8
6	7,303	21.2
9	10,780	21.6
12	14,022	21.7
15	17,448	22.4
18	20,427	22.3
21	23,694	22.5
24	26,752	22.9

TABLE LIV

INDICATED RESPONSE TO ONE-YEAR RETIREMENT OF FEED GRAIN BASES

Percent of All Cropland	Grain Sorghum Acreage	Forage Sorghum Acreage	Projected Sorghum Yield
2.2	1,943	286	36.2

VITA

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