

# BARGAINING POWER PROGRAMS ESTIMATED EFFECTS ON PRODUCTION, NET FARM INCOMES AND FOOD COSTS FOR SPECIFIED PRICE LEVELS

## CARD REPORT 39

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Center for Agricultural and Rural Development

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## PREFACE

Welfare in the majority of rural communities is closely associated with farm income. The level of farm income in typical rural areas is the dominant force in determining the volume of business, the demand for services and the employment base of towns. This study is directed toward improvement of economic opportunities in rural communities as affected by farm income. It deals with the conditions under which farmer bargaining power can increase farm income.

In most industries, output and prices are determined by group action. The individual farmer, however, one of a large number of farmers producing a homogeneous product, can have no effect in setting market price. He is a "price taker." If farmers were able to use group action or bargaining power in establishing the level of price and adjust marketings to the established prices, agriculture would conform more closely to other major industries.

Recently, there has been renewed interest and proposed legislation to give bargaining power a stronger foothold in agriculture. This study has been made accordingly. It indicates considerations involved when bargaining power is used to achieve control over prices for major agricultural commodities. Estimates are made of net farm income, consumer food cost and supply control required under simulated bargaining power programs to attain three alternative price levels. Estimates also are made of government payments required to maintain producer net incomes at levels of recent years for each of the alternative price levels.

This study is one in a continuing series dealing with alternative farm policies. A number of alternative methods, programs or combinations of programs could be used to attain a desired price or income goal: farmer bargaining programs, annual land retirement programs, long-term land retirement programs, government purchase of excess cropland and others. Any of these programs can be used but each program has associated with it a different freedom of decision, location of production and retired cropland, geographic distribution of government payments and income, and regional location of agricultural adjustments. It is information on these considerations and trade-offs that policy makers and the general public need for making choices among alternative policies and for improving rural welfare.

### INTRODUCTION

Traditionally, farmers have been "price takers" and have accepted prices determined in competitive markets for the commodities they produce and sell. This condition of pricing results from the fact that agriculture is an industry of pure competition. The number of producers is so large and the proportion of marketings supplied by each is so small that the individual alone can have no effect on market prices. If he alone reduces output because prices are low, he has no discernible effect on prices and his income is reduced as he sells less at the same price. If market prices are so low that he realizes inadequate returns on his resources, he has no way as an individual to increase prices. Because his commodity is homogeneous with that of other producers, the individual farmer has no effective means of charging prices higher than the market level. If, as an individual, he quotes a higher price for his output, buyers simply substitute the marketings of other producers at the competitively determined price.

Agriculture is one of the few major economic sectors that operate under these extreme conditions of pure competition. In most other industries, the number of producers is either so small or the product is sufficiently differentiated that the individual producer can affect price. If his product is highly differentiated, he can set the price, then adjust output to the level necessary to realize this price. In other words, he need not be a "price taker" but can determine his own price in line with the magnitude of consumer demand. Where the number of producers is few, a single firm may exercise the leadership in changing the level of prices to which other producers adjust their sales.

This difference between the purely competitive nature of agricultural markets and the markets of other industries has long concerned farmers. Various groups of farmers and farm organizations have been interested in devices or programs to lift their marketings from a regime of pure competition so that they might establish prices and have buyers pay accordingly. Once accomplished, this procedure would place farmers more nearly in a marketing environment paralleling that of other major industries. In industries where prices are established by producers, with demand quantity then adjusting to the specified price level, competition need not be eliminated. Even with only a few manufacturers of automobiles, competition has been strong in the long run and some producers have had to cease production accordingly. Or even under conditions of monopolistic competition for differentiated products and services, competition prevails with respect to price.

If farmers were able to use group action to establish bargaining power and circumvent the purely competitive nature of commodity markets, their pricing regime would conform more closely to that of other major sectors of the economy. This goal would be attainable, of course, only under conditions of supply control or management where marketings are restricted to levels consistent with demand and the established price. Competition would not be eliminated from the farming industry. Even if farmers did not compete with each other on the basis of commodity prices, they still would do so for land and other resources.

The supply control and commodity price support programs administered by the federal government for the last 40 years have represented a major attempt to improve prices through reduction in output and marketings. Sources of farm income improvement under these programs have been (a) direct payments to farmers for reducing acreage and output and (b) improved prices resulting from supply control. Under past programs competition within the farming industry has been reflected in higher land values as farmers bid against each for more land to realize the income benefits of farm programs and the scale economies associated with mechanized technology.

A bargaining power program administered by farm organizations could, with effective supply control, place farming on the same footing as other industries, which already operate under a similar regime of price determination and output policy. This is one conceivable goal for farm groups. Its major economic difference from present programs, which provide price and income improvements through land retirement payments and price support mechanisms, would be in the level of prices attained and the amount of supply control exercised. Too, it could be used for farm commodities for which current government programs do not apply.

This study has been made to estimate certain effects that would result under successful farm bargaining or market power programs. The program evaluated is one where farmers collectively might establish a price level and adjust output and marketings to levels leading to its attainment. Henceforth, in this report, we use the term <u>bargaining power</u> to denote the general program or approach under analysis.

#### OBJECTIVES

Two important objectives of the study are:

- to determine the levels of bargained prices necessary for major agricultural commodities if farm income is to be maintained at recent or specified levels while price support and government diversion payments are absent;
- 2. for alternative bargained price levels, to determine the amount of government payments still required to maintain net farm income at recent or specified levels.

Auxiliary objectives of the study include estimation of quantities that relate to these price and income levels. Major quantities to be estimated include: (1) the level of supply control necessary to attain three alternative price levels for selected commodities, (2) the level of farm income attained under each price level, (3) the amount of government payments necessary to keep farm income at specified levels under each price level, (4) food costs under the alternative price levels, and (5) auxiliary data relating to the acreage, distribution and production of crops under the various alternatives outlined.

Current farm programs already provide supply control and price maintenance at recent year levels. Farm income has been maintained or improved not only through these supply-price effects but also through direct payments to farmers for their participation in acreage reduction programs. A bargaining power program that attained the same level of prices and supply control without payments would result in reduced income, since government income sources would be eliminated. Hence, an objective of this study is to determine the level of government payments required under a bargaining power program to maintain specified levels of net farm income.

## INTEREST AND CONDITIONS OF BARGAINING POWER

While agreement on the method of attainment has not been unanimous, bargaining power to improve the economic position of agriculture has long been a common goal of farm groups. $\frac{1}{}$ 

<sup>1/</sup> For statements on bargaining power by the major farm organizations, see National Farm Institute, Bargaining Power for Farmers, Ames, Iowa State Univ. Press, 1968.

The over-all goal of bargaining power for farmers is the improvement of the terms of trade of the farm sector with the rest of the economy. $\frac{2}{}$  To this end, bargaining power has been proposed to bring desired changes in both price and nonprice conditions of the market.3/ Four rather specific reasons why farm groups propose bargaining power as a means of maintenance or improving the economic environment of agriculture are: (1) Farmers want to remain the managers of agriculture. Farmers and farm organizations have become increasingly concerned about posed developments in the industry such as corporate and tax loss farming, vertical integration by processors, large-scale industrial farming units and broad acquisition of land resources by outside investors. (2) They want to widen markets for agricultural commodities. Before reliance on supply control, farmers looked to market development as a means of resolving economic pressures resulting from rapidly increasing supplies and low commodity prices. The P.L. 480 program using food for international aid has provided a large increment in demand through this means. Farmers have sometimes expressed the belief that, if promotion programs were properly planned and implemented, even domestic demand for food could be enlarged considerably. A recent study on food consumption and demand raises questions about the magnitude of this opportunity. Egbert and Hiemstra's study provides estimates indicating that without a supply control program, domestic food demand would have to be increased by 25 percent to maintain farm prices and income at their present levels. $\frac{4}{}$  They further estimate that a \$3.3 billion increase in food consumption expenditures would only increase food consumption by 2 percent. The limited opportunities in demand expansion thus lead major farm groups to suggest bargaining power for other reasons. (3) Farmers want to establish higher and more stable prices through ability to decide on a price and to

- 2/ George W. Ladd, Agricultural Bargaining Power, Ames, Iowa State Univ. Press, 1964, p. 13; and Ewell P. Roy, Collective Bargaining in Agriculture, Danville, The Interstate Printers and Publishers, Inc., 1970, p. 4.
- 3/ For a discussion of the present scope of farmer bargaining in the United States, see Ewell P. Roy, Collective Bargaining in Agriculture, Danville, The Interstate Printers and Publishers, Inc., 1970, Chapter 2.
- 4/ Alvin C. Egbert and Stephen J. Hiemstra, "Shifting Direct Government Payments from Agriculture to Poor People: Impacts on Food Consumption and Farm Income," Agricultural Economics Research 21:61, July 1969.

adjust output to it. Because of the very low price elasticity of demand for farm products, an effective supply control program can result in increased net farm income. <u>5</u>/ (Therefore, an important objective of this study is to estimate levels of production and income consistent with alternative price levels and supply control which might be attained through effective bargaining power programs). (4) Farmers want to improve terms of trade by effects on nonprice variables. Potentials include improving marketed grades and qualities of products, long-term contracts for greater certainty of markets and improved scheduling of marketings and plant deliveries to lessen seasonal price variations.

Sources of Gain from and Conditions for Bargaining Power

If farm income is to be increased through bargaining power, the increment to income must be drawn from consumers in the form of higher prices, from the processing sector through greater competition or increased efficiency to lessen the marketing margin, or from the government in the form of legislation or payments to farmers. For the first two sources, specific conditions seem necessary to accomplish price changes and income transfers. These include: (1) long-term control over the supply of output so that market means are available to enforce and attain pricing goals, (2) recognition by the opposing participant (processor or handler) in the bargaining process of the bargaining strength and the bargaining agent of farm groups, (3) financial strength of members and their organization to bear costs of market withholdings or greatly restrained supplies to enforce market price goals, (4) participation of farmers with the vast majority of output so that

<sup>5/</sup> Price elasticity of demand refers to the change in quantity marketed or purchased (demanded) relative to a change in price. Demand is inelastic if a given percentage increase in price is associated with a smaller percentage decrease in quantity demanded. Under an inelastic demand, a smaller quantity selling at a higher price thus will increase total market revenue. (For an elastic demand, quantity demanded changes by a larger percentage than price and a smaller output sold at a higher price will decrease total market revenue.)

"free loading" can be prevented by some farmers who might otherwise increase output and sales under more favorable prices and undermine the program, and (5) sufficient loyalty of members, or control over them, so that "free loading" does not arise. $\frac{6}{}$ 

Effective long-run control over supply is the most important factor for successful bargaining as a means to price and income improvement in agriculture. Although the necessary proportion of output controlled depends on the product, supply control must be adequate to have important effects in the market and to be consistent with the conditions of demand. For commodities such as wheat, corn, soybeans and other widely grown products, supply control poses a large and complex problem. These products are produced on a nationwide basis and effective supply control and bargaining must be organized accordingly. If not all producers are represented by the bargaining agent, means must exist to prevent nonmembers from supplying the market. If all existing producers are represented by the agent, successful outcome of the bargaining process may encourage new producers to begin supplying the market. These difficulties must be overcome in a framework such that the bargaining agent or association has legal authority and is not subject to prosecution under the antitrust laws. Recognition by the opposing participant (processor or handler) is essential for successful bargaining and is directly related to supply control. The opposing participant must not be able to turn to substitute sources of supply or to substitute products. Hence, unless the opposing participant finds it necessary to recognize the bargaining agent, group or association, bargaining attempts will be futile. The opposing participant must either enter into legal contracts to assure these conditions or he must be aware of the farmer association's ability to inflict financial penalties on the noncooperative plant, company or sector.

Supply control contracts and other features of bargaining activities must apply simultaneously to all major food substitutes. Success is unlikely over time if bargaining power applies only to supply control and increased prices for beef but not for pork and poultry -- or for grain sorghum, but not for barley, corn and oats.

<sup>6/</sup> For a more detailed breakdown of certain conditions, see Roy, Collective Bargaining in Agriculture, p. 47.

Hence, for wheat, feed grains, soybeans, beef, pork and other widely grown products, the bargaining program must be coordinated. Coordination becomes more difficult as producers become more scattered, specialized and less concerned about other product groups. Conflict among and within producer groups also may prevail, especially where some are producers and others are users of a product, such as feed grains or feeder cattle.

Consequently, the conditions of adequate supply control are the most important considerations in bargaining power to increase prices and income. As denoted elsewhere, these conditions seem those on which farmers are most reluctant to agree. 7/ It is not, of course, bargaining power per se that has the promise of increased prices and income. Rather it is the possibility that bargaining power can be used in conjunction with effective supply control to lead to price improvements. The fundamental problem of agriculture stems from the basic supply and demand conditions of agriculture; namely, the vast potential to rapidly increase supply and the highly inelastic domestic demand. These basic conditions of supply and demand, especially for wheat, feed grains, pork and similar products, will not disappear merely through the institution of bargaining associations. $\frac{8}{}$  The bargaining association must have effective control over supply in a manner that allows attainment and enforcement of price goals. If the primary goal is price improvement and a greater share of the marketing margin, then much more power and supply control must be in the hands of the bargaining group. If farmers want only improved marketing efficiency or improved product grading, less power is needed. In other words, bargaining for fringe benefits may be easier than bargaining for and insuring the conditions of higher prices.

Price levels attained through bargaining processes may have important effects on imports and exports, or may need to be related closely to existing trade conditions and legislation.

<sup>7/</sup> E.M. Babb, "Bargaining Methods in Agriculture," in National Farm Institute, Bargaining Power for Farmers, Ames, Iowa State Univ. Press, 1968, p. 47.

<sup>8/</sup> See Sidney Hoos, "How Farmer Cooperative Bargaining Has Worked on the Pacific Coast," in National Farm Institute, Bargaining Power for Farmers, Ames, Iowa State Univ. Press, 1968, p. 58.

Higher prices cause farm products to be less competitive in world markets. High domestic prices encourage imports and require either a tariff or quota to control amounts imported. Greater trade barriers for imports generally lead to retaliation by other countries. The attainment of higher prices through bargaining power thus poses certain problems not encountered in the conventional supply control programs used over the last several decades. For certain products, there is even the threat of new substitute commodities if prices are pushed too high.

Existing Laws and Bargaining Power in Agriculture

Producers of farm products have long had a legal basis for organization of farm cooperatives.<u>10</u>/ The Clayton Act of 1914 states that antitrust laws shall not be interpreted to forbid the existence and operation of labor, agricultural or horticultural organizations not having capital stock or conducted for profit or to forbid or restrain members from carrying out the legitimate aims of their organizations. The Clayton Act provides exemption from the Sherman Act (antitrust law) for farm cooperatives. It applies, however, only to nonstock cooperatives and does not sanction farmer bargaining for product prices.

The Capper-Volstead Act (1922) allows farm producers to join together in associations, cooperatives or otherwise, with or without capital stock for the purpose of collectively processing, handling or marketing their products. The Act empowers the Secretary of Agriculture to restrain any cooperative from monopolizing or restraining trade to the extent that the price of any agricultural product is unduly high. If the Secretary does not act, the Department of Justice can bring prosecution under the Sherman Act or the

<sup>9/</sup> For a discussion of export and import problems, see Dale E. Hathaway, "How United States Price Policies Affect Imports and Exports," in National Farm Institute, Bargaining Power for Farmers, Ames, Iowa State Univ. Press, 1968, pp. 86-95.

<sup>10/</sup> See Roy, Collective Bargaining in Agriculture, Chapter 4; and Donald F. Turner, "Agricultural Cooperatives and Antitrust Laws," in Vernon W. Ruttan, Arley D. Waldo and James P. Houck (ed.), Agricultural Policy in an Affluent Society, New York, W.W. Norton and Co., Inc., 1969, Part IV.

Clayton Act. The Act provides for cooperative marketing or bargaining over the sale of agricultural products. Even though farmers may form cooperatives without violating the antitrust laws, once formed the cooperatives are treated like other businesses under the antitrust laws. Membership in the cooperatives must be voluntary. Although it permits farmers to bargain as a group, processors must bargain as individuals under present antitrust laws. The Act does not provide for legal recognition of farmer groups in the collective bargaining process as the Wagner Act does for organized labor. Hence, the Capper-Volstead Act allows voluntary bargaining or marketing organizations to exist, but once in existence does not provide for recognition by the opposing participant or give monopoly power to the farmer group.

The Agricultural Marketing Agreements Act (1937) authorizes the Secretary of Agriculture to enter into marketing orders with both producer associations or cooperatives and processors or handlers to promote the orderly marketing of farm products. The marketing orders are exempt from antitrust laws but are not allowed for a number of commodities. Commodities excluded include: wheat, corn, cotton, soybeans, barley, milo, oats, rye, broilers, table eggs, livestock and a great many other products. The marketing orders establish minimum grades, standardization of containers, etc. The orders regulate the commodity flow to market, divert excess supplies to secondary markets (e.g., milk), prohibit unfair competitive methods and trade practices and establish projects for research and development. Two-thirds of the product producers must approve the marketing orders; over-all supervision is by the Secretary of Agriculture. The present laws do not allow restriction on market entry or production. As a result, it might be expected that any significant price increase will be removed in the long run by expanded output of the product producers. However, the marketing orders do provide for orderly marketing of products included under the law (such as milk).

The Agricultural Fair Practices Act of 1967 establishes standards of fair practices for handlers and processors who deal with farmers. The Act prohibits discrimination in any way against members of a producer association. The Act does not prevent handlers and processors from choosing their customers unless the choice is based on the fact of membership in a producer association. Refusal to trade can be based on commercial reasons and the Act does not require a handler or processor to recognize a producer association. Proposals for Strenghtening Bargaining Power in Agriculture

Four major acts providing some legal authority for bargaining power in agriculture have been discussed. Those currently in existence would not give farmer groups or associations enough control over supply and price determination to attain expected goals of improved farm income. It is possible that more effective legal authorization could prevail at some time in the future. Numerous suggestions recently have been made for mechanisms that would strengthen the bargaining position of farmers. Some have proposed extending labor laws to agriculture, thus giving farmers an element of monopoly power.  $\underline{11}$  / Legislative proposals to improve farmer bargaining power fit into two categories: $\frac{12}{1}$  (1) those that would amend existing legislation and (2) those that would replace or supplement existing legislation. Most of these two kinds of proposals can be further subdivided into two types: (a) legislation without a mechanism for supply control and (b) legislation with a mechanism for supply control. We now discuss characteristics of these last two types of legislation.

## Wagner Type of Act for Farmers

The Wagner Act of 1935 applying to industrial labor unions has been suggested as a model for agriculture. The basic parts of this legislation are:

- 1. The National Labor Relations Board was established to carry out the aims of the Act through supervision of elections and certification of bargaining agents.
- 2. Employers are required to recognize and bargain with certified unions and if an agreement cannot be reached, it must be submitted to arbitration.
- 3. Unions are protected legally in their right to strike.
- 11/ For an argument against this specific proposal, see Donald F. Turner, "Agricultural Cooperatives and the Antitrust Laws," in Vernon W. Ruttan, Arley D. Waldo and James P. Houck (ed.), Agricultural Policy in an Affluent Society New York, W.W. Norton and Co., Inc., 1969, p. 197.
- 12/ See Roy, Collective Bargaining in Agriculture, Chapters 8 and 9.

Proposals for a parallel act for agriculture have not included supply control provisions. Hence, certain gains would be limited. If a high price is established in the bargaining process, difficulties would be encountered in controlling producer response and in maintaining discipline over membership. Supply control through voluntary agreements of producers would be complex for products, such as wheat, corn, soybeans, cattle and calves, etc., produced by hundreds of thousands of farmers in locations thousands of miles apart. Especially for these products, some type of legally authorized supply control mechanism would seem necessary for success.

## Marketing Orders with Supply Control or Producer Marketing Boards

The second type of proposed legislation has provisions for supply control. This proposed legislation would extend monopoly power to producers of products included in the law with regulation by the federal government. A law of this kind could be a substitute for present government farm programs. The basic principles of the supply control, bargaining proposals are:

- 1. All producers of a given product would be forced to comply with actions or provisions voted by a majority of the producers.
- 2. A board of directors for a producer marketing board would be appointed and (or) elected to:
  - a. determine output levels.
  - b. determine market price.
  - establish policies for orderly marketing, grades, standards, etc.
  - d. collect fees to cover expenses, supervise elections, enforce minimum prices, etc.

An example of proposed legislation which includes these principles is the Mondale Bill.  $\underline{13}$ / The Mondale Bill contains the following elements:

13/ 90th Congress, 2nd Session, Senate Bill 2973, Introduced February 15, 1968. Also see Roy, Collective Bargaining in Agriculture, p. 178.

- 1. The Bill would establish the National Agricultural Relations Board of five members appointed by the President with Senate approval. (The Board is analogous to the NLRB created by the Wagner Act of 1935.) The Board would conduct a referendum to determine whether a producer marketing board should be established for a given product to negotiate price and nonprice conditions. The opposite participant (processor or handler) would also appoint a board. Consumers would be represented and the three interests, producers, processors and consumers, would meet and bargain in good faith.
- 2. The price agreed upon by this bargaining process would be free from antitrust prosecution.
- 3. Marketing controls would be available to limit supply. Another referendum would be called and if producers favored controls, marketing allotments would be distributed.

The Mondale Bill attempts to establish "a fair and reasonable price to producers." Included in this price are "(1) the direct cost of production including hired labor; (2) the reasonable value of the time, skill, and experience of the individual producing commodity or commodities; (3) a fair return upon essential invested capital; (4) continuation of the American family farm pattern of agricultural production; and (5) other appropriate factors including compensation comparable with that of other persons engaged in other means of earning a livelihood..."<u>14</u>/ Of course, farms of different sizes have different levels of production costs and what is a "fair" price for one producer may be "too low" for another. Conceptually, though, the bargaining process could establish a market price for every agricultural commodity.

Our analysis that follows measures certain outcomes that might prevail if farmer bargaining power were to be exercised in attaining certain levels of price and supply control. We recognize, as reviewed in the preceding discussion, that the necessary supply control and price administration is not easily attained under existing

14/ Senate Bill 2973.

legislation and the complex pattern of agriculture. Having reviewed these potentials and restraints, however, we now turn to the analysis of expected economic outcomes that could prevail if conditions should allow attainment of the appropriate level of supply control for the alternative price levels used in the study.

## ALTERNATIVES ANALYZED

Products included in the analysis are: wheat, feed grains, soybeans, cotton, cattle and calves, hogs, sheep, broilers and turkeys. Three potential levels of bargained prices are evaluated for these major agricultural products. For brevity, these price levels are designated as Level A, Level B and Level C. For each price level, estimates are made of the resulting (a) level and location of production of wheat, feed grains, soybeans and cotton, (b) net farm income, (c) government payments required to maintain net farm income at specified levels and (d) consumer food cost. Acreage quotas are imposed for the major crops to mesh supply with demand at each price level. The price levels studied are not recommended levels but have been selected among many possible as a base for the related estimates of production of major crops, net farm incomes, government costs and food costs. All estimates and projections are for 1975. Per capita income, population and yield coefficients have been projected to 1975 for the analysis.

## METHOD AND ASSUMPTIONS FOR THE ANALYSIS

The analysis is based on results from a linear programming model with 150 producing regions and 31 demand or consuming regions. The model includes production activities for wheat, feed grains, soybeans and cotton. $\frac{15}{}$  For each price level studied, a set of projected per acre yields and costs was computed for each crop in each producing region. Total demand levels for wheat, feed grains, oilmeals and cotton at each price level were projected for each of the 31 consuming regions of the nation. Livestock production and demand are incorporated implicitly. (Demand for livestock products was converted into feed equivalents and included in the total demands for wheat, feed grains and oilmeals.) The programming model was applied within the land restraints and demand levels specified for each producing and consuming region. The model then determined

<sup>15/</sup> For a description of the linear programming model used in this study see Appendix C.

the pattern of production that would maximize the net return from production of wheat, feed grains, soybeans and cotton, given the costs of producing these crops, their selling prices and costs of transportation among the various producing and consuming regions.

## Three Alternative Price Levels Studied

Each of the price levels specified has a corresponding set of per capita consumptions and exports of wheat, feed grains, oilmeals and cotton associated with it. Production of crops meets these specified levels of domestic and export demand estimated for each alternative price level. The same level of carry-over stocks for major commodities was used for the three price levels. The cropland base remains constant at 1965 magnitudes. Also, production quotas used in the bargaining power alternatives are not transferable among regions.

Farm prices of the commodities included in the study are presented in Table 1. The levels of production consistent with each price level and the prespecified domestic and export demand were determined for each set of 1975 projected prices (i.e., Level A, Level B and Level C).

Under Level A prices in 1975, average prices received by farmers for all crops except cotton are near the 1966 level but are above 1968 and 1969 actual. The average farm price for all cattle and calves is between the 1968 and 1969 levels and the hog price falls between the 1966 and 1968 levels. Broiler price is above recent year levels and lamb price is near 1966 actual. For Level B and Level C prices, all crop and livestock prices are above average levels for recent years.

## Per Capita Consumption and Export Levels

Per capita consumption estimates for beef and veal, pork and broilers for each price level used are summarized in Figure  $1.\frac{16}{}$ 

<sup>16/</sup> Lamb and mutton consumption for price Levels A, B and C is 3.6 pounds, 2.9 pounds and 2.5 pounds of carcass weight equivalent, respectively. Turkey consumption estimates are 8.5 pounds ready-to-cook weight under Level A prices, and 8.3 pounds and 8.1 pounds under Level B and Level C prices, respectively. Egg consumption is held constant at 290 eggs per capita and dairy products at 566 pounds of milk equivalent per capita for all three price levels studied.

		Act	ual Prices	s <u>a</u> /	197	5 Prices $\frac{b}{d}$	/	1
Item	Unit	1966	1968	1969	Level A	Level B	Level C	
Crop Prices		-						1
Wheat	dol./bu	1.63 <u>c</u> /	1.24	1.24	1.50	1.85	2.20	
Corn	dol./bu	1.24	1.06	1.12	1.25	1.50	1.75	
Soybeans	dol./bu	2.75	2.42	2.33	2.75	3.25	3.75	
Cotton	dol./bu	0.21	0.33	0.21	0.28	0.31	0.32	
Livestock Prices								15
Cattle & Calves	cents/1b	22.2	23.4	26.2	24.0	30.0	35.0	
Hogs	cents/1b	22.8	18.6	22.2	20.0	27.0	33.0	
Broilers	cents/1b	15.3	14.3	15.2	17.0	22.0	28.0	
Lambs	cents/1b	23.4	24.4	27.2	22.0	28.0	35.0	

Table 1. Alternative price levels received by farmers for major commodities in 1975 with

All prices for 1975 are measured in 1966 equivalent dollars and do not take into account inflation from 1966 to 1975. ام

The domestic certificate payment under the Wheat Program was increased from \$0.75 in 1965 to \$1.32 in 1966. <u>े</u>।



Figure 1

The per capita quantities shown reflect consumer response to price at each level, based on existing knowledge of price elasticities of demand, plus trends relating to income growth. Under Level A prices in 1975, per capita consumption of beef and veal is near the 1969 level (carcass weight equivalent). $\frac{17}{}$  Consumption of pork is estimated at 8 pounds per person fewer (carcass weight equivalent) and per capita consumption of broilers is 5 pounds higher (ready-tocook weight) than the 1969 level.

Under Level B prices, per capita consumption of beef and veal is estimated at 8 pounds fewer than under Level A prices. Pork consumption is projected at 5 pounds per person fewer and broiler consumption at 2 pounds per person more than under Level A prices.

Under Level C prices in 1975, per capita consumption of beef and veal is estimated at 17 pounds fewer, pork at 9 pounds fewer and broilers at 5 pounds more than under Level A prices.

17/ Consumption of beef and veal under Level A prices in 1975 is below actual 1969 (Figure 1) even though, with Level A prices and an increase in income and changes in tastes between 1969 and 1975, one would expect the 1975 per capita level to exceed 1969 actual. But 1969 actual livestock prices, reported in Table 1, are in current dollars, not in 1966 equivalent dollars as are the 1975 prices. If the 1969 actual livestock prices (Table 1) are adjusted for inflation between 1966 and 1969 (i.e., put in 1966 equivalent dollars) and assuming these adjusted prices prevail in 1975, given higher income and changes in tastes, per capita consumption of beef and veal in 1975 is estimated at 114 pounds.

On the other hand, if we assume that prices in 1975 are at the same level as 1969 actual (i.e., assume 1969 livestock prices already are in 1966 equivalent dollars), per capita consumption of beef and veal is estimated at 111 pounds. If we assume 1966 actual livestock prices prevail in 1975 (Table 1), per capita consumption of beef and veal is estimated at 118 pounds. Corresponding adjustments would also take place for pork and other livestock products. Figures 2, 3, 4 and 5 summarize export levels of wheat, feed grains, oilmeals and cotton for each price level included in the study. Wheat exports (including P.L. 480 or similar shipments) are assumed the same at all three price levels. Under the International Wheat Agreement, wheat exports will be determined by intercountry agreements and the price of wheat will not be the primary determinant of exports. As a result, wheat exports of 600 million bushels are used for all three price levels in 1975. Total wheat exports were 610 million bushels in 1969 (Figure 2).

Exports of feed grains, oilmeals and cotton are more responsive to price changes. Under Level A prices, feed grains exports (corn equivalent) are estimated to be near the 1969 level. Under Level B prices, feed grains exports fall 3.5 million tons and under Level C prices, 8.5 million tons below exports under Level A prices. Feed grains exports totaled 19.6 million tons in 1969 (Figure 3). Under Level A prices in 1975, oilmeal exports are projected at 186 million bushels (soybean equivalent) fewer than the 1969 actual. Under Level B and Level C prices, exports are reduced 117 million and 311 million bushels, respectively, below exports under Level A prices. Oilmeal exports were 886 million bushels in 1969 (Figure 4). <u>18</u>/

Under Level A prices in 1975, exports of cotton lint are estimated at 0.3 million bales fewer than 1969 actual. Under Level B prices, exports are 0.5 million and under Level C prices 1.5 million bales fewer than exports under Level A prices. Exports of cotton totaled 2.8 million bales in 1969 (Figure 5).

## PRODUCER EFFECTS

This section summarizes the amount and location of wheat, feed grains, soybeans and cotton produced in 1975 under the three price levels used in the study. Also, for each price level, resulting net farm income and the level of government payment necessary to maintain producer income at specified levels are estimated. Additional sections summarize consumer effects and other outcomes of interest to farm groups, administrators and the public generally when alternative means might be used to attain higher levels of farm prices.

<sup>18/</sup> See National Farm Institute, Bargaining Power for Farmers, p. 96. According to Glenn H. Pogler, if the price of soybeans was \$3.40 or \$3.50 per bushel, the United States would lose a substantial part of its market.



Figure 2



Figure 3



Figure 4



Figure 5

Acreages, Production and Yields for the United States Under Alternative Price Levels in 1975

Table 2 shows the estimated 1975 acreages, production and yields of major crops for the United States for the three levels (Level A, Level B and Level C) of prices. Tables 3, 4, 5, 6 and 7 summarize the regional location and distribution of all crops and each major crop for the corresponding prices.

## Wheat Effects

Total wheat acres range between 43.2 million and 47.7 million acres under the three price levels. Total wheat production is lowest under Level C prices, slightly less than 1.5 billion bushels, and highest under Level B prices, slightly more than 1.5 billion bushels. More wheat is used for feed purposes under Level B prices than under the other two price levels. Consequently, wheat production is higher. 19/ Wheat yield is estimated at 30.8 bushels per acre with Level A prices compared with 33.8 bushels per acre under Level C prices. Wheat acreage, production and yield for Level A prices are near 1969 actual levels (Table 2).

## Feed Grains Effects

Acres of feed grains range from 76.3 million acres under Level C prices to 92.9 million acres under Level A prices. Production is estimated at 154.2 million tons of corn equivalent under Level C prices compared with 176.8 million tons under Level A prices. Since demands for feed grains, soybeans and cotton are more responsive to price change than is wheat demand, production of the former crops shows more variation under the three price levels. Feed grains yields range from 1.90 tons per acre under Level A prices to 2.02 tons per acre under Level C prices. Although under Level B prices feed grains production is similar to actual production in 1968, yield under Level B prices is higher and feed grains acres are substantially lower than in 1968 (Table 2).

<sup>19/</sup> Under Level B prices, farmers would find it profitable to use more wheat and less feed grains for feed purposes.

		Actual <u>a</u> /		19	75 Prices <u>b</u> /	
Cron	1967	1968	1960	Level	Level R	Level
		0	Harvested Ac	reages (000)	7	7
Wheat	58,771	55,262	47,555	47,712	46,903	43,200
Feed Grains	100,750	97,117	95,427	92,857	81,511	76,313
Soybeans	39,767	41,104	40,857	36,364	31,351	25,671
Cotton	7,997	10,160	11,094	13,260	11,909	10,462
			Total Produc	tion (000)		
Wheat (bu) ,	1,522,382	1,576,251	1.458.872	1,469,879	1,520,663	1,460,209
Feed Grains (ton) <sup>C/</sup>	172,809	165,348	170,636	176,801	163,505	154,163
Soybeans (bu)	976,060	1,103,129	1,116,876	1,026,654	926,862	793,406
Cotton (bales)	7,458	10,948	10,080	12,452	11,952	10,952
			Yield Per Ha	rvested Acre		
Wheat (bu)	25.9	28.5	30.7	30.8	32.4	33.8
Feed Grains (ton) <sup>C/</sup>	1,72	1.70	1.79	1.90	2.01	2.02
Soybeans (bu)	24.5	26.8	27.3	28.2	29.7	30.9
Cotton (1bs)	447	516	436	470	502	523
<u>a</u> / Source: Crop P	roduction 1969 Ar	nnual Summar	y, USDA SRS,	December 1969,		
<u>b</u> / Price Level A:	Corn @\$1.25 per and cotton @\$0.3	bushel, when 8 ner nound	at @\$1.50 per in 1975.	bushel, soybe	ans @\$2.75 p	er bushel
Price Level B:	Corn @\$1.50 per	bushel, when	at @\$1.85 per	bushel, soybe	ans @\$3.25 p	er bushel
Price Level C:	and cotton @\$0.3 Corn @\$1.75 per and cotton @\$0.3	<pre>31 per pound bushel, whea 34 per pound</pre>	in 1975. at @\$2.20 per in 1975.	bushel, soybe	ans @\$3.75 p	er bushel

Estimated acreages, production and yields under the three alternative price levels in Table 2.

 $\underline{c}$ / Feed grains are reported in tons of corn equivalent.

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#### Soybean Effects

Estimated soybean acres range from 25.7 million acres under Level C prices to 36.4 million acres under Level A prices. Production of soybeans ranges from 0.8 billion bushels under Level C prices to slightly over 1.0 billion bushels under Level A prices. Estimated acreages of soybeans under all three price levels are below 1967-69 acreages. Soybean production under Level A prices is above 1967 actual and estimates for Level B and Level C prices are below 1967-69 quantities. Estimated yields for 1975 are all above 1967-69 levels (Table 2).

## Cotton Effects

Cotton acreage ranges from 10.5 million acres under Level C prices to 13.3 million acres under Level A prices. Production is estimated at 11.0 million bales of cotton lint for Level C prices and 12.5 million bales for Level A prices. The lowest yield, 470 pounds per acre, is estimated for Level A prices. Again Level C prices have the highest yield per acre. Estimated acreages and production of cotton for Level A and Level B prices are above 1967-69 levels but are similar to 1968 and 1969 under Level C prices (Table 2).

## Regional Location and Distribution of Wheat, Feed Grains, Soybeans and Cotton in 1975

Table 3 indicates the regional distribution of cropland used for all major crops. Tables 4, 5, 6 and 7 indicate the regional distribution of wheat, feed grains, soybeans and cotton under the three alternative prices. The acreage shown in each instance is that estimated to restrain output to attain the specific price level. When prices rise, the incentive for producers to increase their output is stimulated. But when prices change, the quantities demanded of products also change. (In the complex of the model used there is both a change in demand and a change in quantity demanded.)

The rank of acreages in the top four regions under the alternative 1975 prices is the same as 1969 actual: Corn Belt, Northern Plains, Southern Plains and Lake States (Table 3). Under Level A prices the Lake States, Corn Belt and Southeast regions have greater acreages of major crops than in 1969. All remaining regions have less. Under Level B and Level C prices, all of the 10 farm production regions have harvested acres below 1969 actual.

	1969 <u>a/</u> Actual <u>a</u> /	1975 Leve	Price <sub>b/</sub>	1975 Leve	Price_/ 1 B <u>c</u> /	1975 F Level	rice <sub>d/</sub>
	Total	Total	Change from	Total	Change from	Total	Change from
Region	Acres	Acres	1969	Acres (Thousand	1969 Acres)	Acres	1969
United States	194,933	190,191	-4,742	171,677	-23,256	155,644	-39,289
Northeast	4,220	4,219	-	3,867	- 353	3,581	- 639
Lake States	18,782	20,650	+1,868	17,294	- 1,488	15,980	- 2,802
Corn Belt	58,433	61,139	+2,706	54,929	- 3,504	46,822	-11,611
Northern Plains	45,118	40,605	-4,513	38,044	- 7,074	35,309	- 9,809
Appalachians	8,320	7,891	- 429	6,821	- 1,499	6,417	- 1,903
Southeast	6,837	7,288	+ 451	5,493	- 1,344	5,658	- 1,179
Delta	12,039	9,198	-2,841	8,805	- 3,234	8,214	- 3,825
Southern Plains	21,337	21,045	- 292	19,922	- 1,415	17,516	- 3,821
Mountain	12,679	11,727	- 952	10,916	- 1,763	10,276	- 2,403
Pacific	7,168	6,429	- 739	5,586	- 1,582	5,871	- 1,297
<u>a</u> / Source: Crop	Production	1969 Ann	ual Summa	ary, USDA S	RS, December	1969.	
b/ Corn @\$1.25 n	r hushel	wheat @\$1	.50 ner 1	vns [anshe]	heans @\$2.75	ner hushel	and cotton

Table 3. Distribution of cropland used for major crops for the 10 farm production regions under the three alternative price levels in 1975 with actual 1969 for comparison.

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- L, soybeans way. Jo ad nc.149 @\$0.28 per pound in 1975. 21
- Corn @\$1.50 per bushel, wheat @\$1.85 per bushel, soybeans @\$3.25 per bushel and cotton @\$0.31 per pound in 1975. े।
- Corn @\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel and cotton @\$0.34 per pound in 1975. <del>م</del>

Total acres used for all major crops are 4.7 million below 1969 actual under Level A prices, 23.3 million fewer under Level B prices and 39.3 million (20.2 percent) fewer under Level C prices. And 59.0 million acres were retired under various government land retirement programs in 1969. Similar comparisons can be made among the alternative 1975 prices. Total cropland used under Level B prices is 18.5 million acres fewer and under Level C prices, 34.5 million acres fewer than under Level A prices in 1975. As the price level rises, it becomes more and more profitable for all regions, including marginal areas, to increase production. Naturally, given the nature of demand, acreage and production must decrease if higher price levels are to be attained and surplus stocks are not to accumulate.

Acres of cropland required for major crops under an acreage quota, supply control program are substantially above requirements of alternative control programs. For example, with an unrestricted long-term land retirement program and production located in areas of greatest comparative advantage, 155 million acres would produce about the same level of output as 190 million acres do under Level A prices in Table  $3.\frac{20}{}$  Under the unrestricted land retirement program, production shifts toward productive areas of the country and away from marginal producing regions. With acreage quotas based on historical crop acreage in a region to control output, this shift does not take place. Since land in marginal areas is lower yielding, more acres are required to produce a given level of output.

## Wheat Effects

The change in total wheat acres as the price level varies is not large, since wheat exports are assumed not to respond to price changes (Table 4). Change in total wheat acres between the alternative 1975 prices is due primarily to the change in quantities of wheat that farmers use for feed. Under all levels of 1975 prices, the rank of wheat acres for the top four regions is: Northern Plains, Southern Plains, Mountain and the Corn Belt. The Southern Plains and Mountain are reversed from their positions in 1969 but the difference is small.

<sup>20/</sup> For a previous study using prices essentially the same as Level A of this study, see Howard C. Madsen, Earl O. Heady and Kenneth J. Nicol, Trade-Offs in Farm Policy, CAED Rpt. 36, Center for Agricultural and Economic Development, Iowa State Univ., 1970.

Wheat acreage increases slightly in the Corn Belt as the price level rises, when compared with 1969 actual. But acres of wheat in the Corn Belt in 1969 were below earlier years. For example, wheat acres harvested in the Corn Belt totaled 5.2 million in 1965. Other regions, such as the Delta, show large percentage changes from 1969 but the absolute acreage changes are small.

#### Feed Grains and Soybean Effects

The total acres and distribution of feed grains and soybeans follow a pattern similar to total cropland use. Under the alternative 1975 prices, the rank of feed grains acres for the top four regions is the same as the 1969 actual: Corn Belt, Northern Plains, Lake States and the Southern Plains (Table 5). The Corn Belt, Appalachians and Lake States show an increase under Level A prices in feed grains over 1969, but 1969 acres were below previous year levels due to land retirement and supply control programs.

As the price level rises, acreage quotas must be tightened to restrain output to market demand. Under Level A prices in 1975, total feed grains acres are 2.6 million below 1969 actual. Under Level C prices, feed grains acres are reduced 19.1 million (20.0 percent) below 1969 when 59.0 million acres already were diverted from crop production. When prices increase from Level A to Level C, the largest acreage reduction takes place in the Corn Belt where nearly 8.0 million acres are removed from production.

Under the three 1975 price levels, the rank of soybean acres for the top three regions is the same as 1969 actual: Corn Belt, Delta and Lake States. As with feed grains, acreage quotas must be tightened to restrain output as prices rise (Table 6). Under Level A prices, total soybean acres are 4.5 million below 1969 actual. Under Level C prices, acres decline 15.2 million (37.2 percent) below 1969. When prices rise from Level A to Level C, the Corn Belt again shows the largest acreage reduction with 6.5 million acres removed from production.

## Cotton Effects

Cotton output also must be restrained as prices increase. As the price increased from Level A to Level C, total cotton acres decline by 2.8 million (Table 7). Acres under Level C prices are 634 thousand (5.7 percent) fewer than 1969 actual. Cotton acreage in 1969 was below that of 1965 when acres harvested totaled 13.8

	Actual $\frac{1969}{a}$	1975 Lev	Price b/	1975 Levi	Price _/ el B/	1975 Leve	Price <u>d</u> /
			Change		Change		Change
Region	Total Acres	Total Acres	trom 1969	Total Acres	1rom 1969	Total Acres	trom 1969
D			(Tho	usand Acr	es)		
United States	47,555	47,712	+ 157	46,903	- 652	43,200	-4,355
Northeast	680	873	+ 193	776	96 +	784	+ 104
Lake States	1,510	2,250	+ 740	1,931	+ 421	2,087	+ 577
Corn Belt	4,345	5,950	+1,605	6,062	+1,717	5,614	+1,269
Northern Plains	21,311	19,607	-1,704	19,329	-1,982	17,257	-4,054
Appalachians	776	652	- 124	606	- 170	677	- 99
Southeast	290	114	- 176	108	- 182	141	- 149
Delta	464	51	- 413	51	- 413	401	- 63
Southern Plains	7,019	7,705	+ 686	7,705	+ 686	6,807	- 212
Mountain	7,555	7,238	- 317	7,063	- 492	6,515	-1,040
Pacific	3,605	3,272	- 333	3,272	- 333	2,917	- 688
<u>a</u> / Source: Cro	op Productio	n 1969 Ar	inual Summa	ry.			
<u>b</u> / Corn @\$1.25 @\$0.28 per p	per bushel, oound in 197	wheat @\$ 5.	il.50 per b	ushel, so	ybeans @\$2.75	per bushel	and cotton

Table 4. Distribution of wheat acres for the 10 farm production regions under the three alternative price levels in 1975 with actual 1969 for comparison.

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Corn @\$1.50 per bushel, wheat @\$1.85 per bushel, soybeans @\$3.25 per bushel and cotton @\$0.31 per pound in 1975. ر ار

Corn @\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel and cotton @\$0.34 per pound in 1975. <u>(</u>

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	1969 Actual <u>a</u> /	1975 Lev	Price <sub>b</sub> /	1975 Lev	Price/ el B <u>c</u> /	1975 Leve	Price <sub>d</sub> /
			Change		Change		Change
	Total	Total	from	Total	from	Total	from
Region	Acres	Acres	1969	Acres	1969	Acres	1969
			(The	ousand Acr	(sə.		
United States	95,427	92,857	-2,570	81,514	-13,913	76,313	-19,114
Northeast	3,097	3,042	- 55	2,826	- 271	2,591	- 506
Lake States	13,417	14,273	+ 856	12,108	- 1,309	11,268	- 2,149
Corn Belt	33,132	35,768	+2,636	32,066	- 1,066	28,023	- 5,109
Northern Plains	21,699	18,797	-2,902	16,853	- 4,846	16,578	- 5,121
Appalachians	3,986	4,218	+ 232	3,876	- 110	3,504	- 482
Southeast	3,082	3,097	+ 15	2,329	- 753	2,700	- 382
Delta	779	166	- 613	89	- 690	235	- 544
Southern Plains	8,711	7,092	-1,169	6,381	- 2,330	5,732	- 2,979
Mountain	4,666	3,896	- 770	3,285	- 1,381	3,253	- 1,413
Pacific	2,858	2,508	- 350	1,701	- 1,157	2,429	- 429
<u>a</u> / Source: Cro	p Productio	n 1969 An	nual Summa	ary.			
b/ Corn @\$1.25	per bushel.	wheat @\$	:1.50 per h	oushel, so	vbeans @\$2.75	per bushel	and cotton

c @\$0.28 per pound in 1975. Corn @\$1.50 per bushel, wheat @\$1.85 per bushel, soybeans @\$3.25 per bushel and cotton @\$0.31 per pound in 1975. <del>ار</del>

Corn @\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel and cotton @\$0.34 per pound in 1975. م/

	1969 <u>Actual<sup>a/</sup></u>	1975 Lev	Price <u>b</u> / el A <u>b</u> /	1975 Lev	Price <u>c</u> /	1975 1 Leve	Price <u>d</u> / 1 C <u>d</u> /
	Total	Total	Change from	Total	Change from	Total	Change from
Region	Acres	Acres	1969 (Th	Acres ousand Ac	1969 res)	Acres	1969
United States	40,857	36,362	-4,495	31,351	-9,506	25,671	-15,186
Northeast	443	304	- 139	265	- 178	206	- 237
Lake States	3,855	4,127	+ 272	3,255	- 600	2,625	- 1,230
Corn Belt	20,651	19,378	-1,273	16,521	-4,130	12,947	- 7,704
Northern Plains	2,108	2,201	+ 93	1,862	- 246	1,474	- 634
Appalachians	2,972	2,075	- 875	1,719	-1,253	1,658	- 1,314
Southeast	2,236	2,084	- 152	1,740	- 496	1,457	- 779
Delta	8,126	5,908	-2,218	5,770	-2,356	5,108	- 3,018
Southern Plains	466	285	- 181	219	- 247	196	- 270
Mountain	ı	I	1	I	1	I	I
Pacific		1	1	1	I	-	I
<u>a</u> / Source: Cro	p Production	n 1969 An	nual Summa:	ry.			
<u>b</u> / Corn @\$1.25 @\$0.28 per p	per bushel, ound in 1975	wheat @\$ 5.	1.50 per bu	ushel, so	ybeans @\$2.75	per bushel,	, and cotton

Distribution of soybean acres for the 10 farm production regions under the three alternative price levels in 1975 with actual 1969 for comparison. Table 6.

- c
- Corn @\$1.50 per bushel, wheat @\$1.85 per bushel, soybeans @\$3.25 per bushel, and cotton @\$0.31 per pound in 1975. <u>ि</u>।
- Corn @\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel, and cotton @\$0.34 per pound in 1975. /p

	1969 Actual <u>a</u> /	1975 Lev	5 Price <sub>b</sub> /	1975 Leve	Price _/ 1 B/	1975 F Level	rice <u>d</u> /
			Change		Change		Change
	Total	Total	from	Total	from	Total	from
Region	Acres	Acres	1969	Acres	1969	Acres	1969
			(Tho	ousand Acre	ss)		
United States	11,094	13,260	+2,166	11,909	+815	10,460	-634
Northeast	I	ı	I	I	I	I	I
Lake States	I	I.	I,	I	I	I	I
Corn Belt	305	43	- 262	280	- 25	238	- 67
Northern Plains	I	I	I	I	I	I	I
Appalachians	586	976	+ 360	620	+ 34	578	80 I
Southeast	1,229	1,993	+ 764	1,316	+ 87	1,360	+131
Delta	2,670	3,073	+ 403	2,895	+225	2,470	-200
Southern Plains	5,141	5,963	+ 822	5,617	+476	4,781	-360
Mountain	458	593	+ 135	568	+110	508	+ 50
Pacific	705	679	- 56	613	- 92	525	-180
<u>a</u> / Source: Cro	p Production	n 1969 Ar	ınual Summa	ıry.			
<u>b</u> / Corn @\$1.25   @\$0.28 per p	per bushel, ound in 1975	wheat @\$ 5.	31.50 per b	ushel, soj	rbeans @\$2.7	'5 per bushel	and cotton

Table 7. Distribution of cotton acres for the 10 farm production regions under the three alternative nrice levels in 1975 with actual 1969 for comparison.

Corn (\$1.50 per bushel, wheat (\$1.85 per bushel, soybeans (\$3.25 per bushel and cotton (\$0.31 per pound in 1975. <del>ا</del>د

Corn @\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel and cotton @\$0.34 per pound in 1975. <del>م</del>/

million. (Cotton production was controlled by the Cotton Program in 1969.)

#### Net Farm Incomes in 1975

The level of net farm income associated with each price level is indicated in Table 8.21/ Net farm income ranges from \$13.9 billion under Level A prices to \$22.7 billion under Level C prices. A fourth alternative, an annual land retirement program with government payments to farmers for participation, has been included in the table for comparison. The price level assumed under this program, termed <u>Comparison Level</u> prices, is below that of Level A. Net farm income is higher, however, because of the land retirement payments.<sup>22</sup>/

## Income Comparisons and Government Payments

Estimated net farm income of \$13.9 billion under Level A prices compares with actual net income of \$16.3 billion in 1966, \$15.1 billion in 1968 and \$16.5 billion in 1969. The net farm income calculated for Level A prices (as well as for the other two levels) does not include any government payments to farmers. Calculations were first made to determine the level of net farm income under three potential levels of prices where bargaining power alone (without government payments) is used as the method of price improvement (Table 8). Then estimates were made of the amount of government payments necessary to maintain a specified level of net farm income (Table 9). Hence, to maintain net income at the 1966 actual level under Level A prices would require government subsidy payments to farmers of \$2.4 billion (Table 9). Payments of \$1.3 billion would be required to maintain net income at the 1968 actual level and payments of \$2.6 billion would be required for the 1969 actual level.

Under Level B prices, 1975 net income is estimated at \$18.7 billion, an amount higher than the actual level in any previous year. Under Level C prices, net income is estimated at \$22.7 billion. Government payments to farmers for supply control and income support are not included for the last two price levels. However, foreign trade in terms of exports is reduced and consumer food costs, as reported in a following section, are somewhat higher.

<sup>21/</sup> See Appendix A for method used to estimate cash expenses.

<sup>22/</sup> For estimates of income and production effects under this lower price level and alternative long-term land retirement programs, see Madsen, Heady and Nicol, Trade-Offs in Farm Policy.

<pre>le 8. Farm income and government payments comparison.</pre>	under al	ternative	price le	vels in 19	)75 with p	rior year	s for
	Ac	tual $\frac{a}{}$			1975 F	rices <u>b</u> /	
	1966	1968	1969	Level A	Level	Level A C R	nnual Land Letirement
			Icome Froi	m Farming	Operation	IS	
			(Mil)	lion Dclla	irs)		
h Receipts from Farm Marketing Juction Expenses d/	43 <b>,</b> 294 33 <b>,</b> 406	44 <b>,</b> 218 36 <b>,</b> 012	47,229 38,444	49,249 39,368	53,823 39.158	57,265 38.608	47 <b>,</b> 775 40 <b>,</b> 428
t Receipts from Farm Marketing	9,888	8,206	8,785	9,881	14,665	18,657	7,347
Money Income and Inventory Change <u>e/</u> t Returns from Farming	3,088 12,976	3,4/4	3,949 12,734	3,645	3,645 18,310	3,645	3,645 10,992
		Inco	ome From (	Government	Sources		
ce Support and Land Retirement Programs f/	2,941	3,095	3,453	0	0	0	4,206
er Government Payment Programs g/	336	367	341	365	365	365	365
tal Direct Program Payments	3,277	3,462	3,794	365	365	365	4,571
AL NET FARM INCOME	16,253	15,142	16,528	13,891	18,675	22,667	15,563
Source: Farm Income Situation, USDA ERS,	July 197	0.					
All values are measured in 1966 equivalent corn @\$1.25 per bushel, wheat @\$1.50 per b in 1975. Level B - corn @\$1.50 per bushel cotton @\$0.31 per pound in 1975. Level C @\$3.75 per bushel and cotton @\$0.34 per po	dollars ishel, s , wheat - corn @	with no a oybeans @\$ @\$1.85 per \$1.75 per 975.	djustmen 32.75 per 5 bushel, bushel,	t for infl bushel ar soybeans wheat @\$2,	lation to ld cotton ଡି\$3.25 pe 20 per bu	1975: Le @\$0.28 pe r bushel shel, soy	vel A - r pound and beans
Same as Wheat, Feed Grain and Cotton Progr wheat @\$1.25 per bushel, soybeans @\$2.15 p cents per pound, hogs @18.2 cents per poun	ams used er bushe 1 and br	during 19 1, cotton oilers @15	)66-70. / @\$0.26 pe i.3 cents	Assumes co er pound, per pound	brn @\$1.05 cattle an l in 1975.	ber bush d calves	el, 022.5
See Appendix A for method used to estimate	cash ex	penses.					
	le 8. Farm income and government payments u comparison. comparison. h Receipts from Farm Marketing duction Expenses $\underline{d}/$ t Receipts from Farm Marketing Money Income and Inventory Change $\underline{e}/$ t Returns from Farm Marketing Money Income and Inventory Change $\underline{e}/$ t Returns from Farm Marketing $Money Income and Inventory Change \underline{e}/t Returns from Farm MarketingMoney Income Strom Farm Marketing\underline{A} and Land Retirement Programs \underline{f}/t Source: Farm Income Situation, USDA ERS, \underline{A}All NET FARM INCOMEAll values are measured in 1966 equivalentcorn @$1.25 per bushel, wheat @$1.50 per bushelcotton @$0.31 per pound in 1975. Level C@$3.75 per bushel, wheat @$1.50 per bushelcotton @$0.31 per pound in 1975. Level C@$3.75$ per bushel and cotton $@$0.34$ per pou some as Wheat, Feed Grain and Cotton Progre wheat $@$1.25$ per bushel, soybeans $@$2.15$ per events per pound, hogs $@18.2$ cents per pound See Appendix A for method used to estimate	Le 8. Farm income and government payments under al comparison. Comparison. Ip66 1966 1966 1966 t Receipts from Farm Marketing 43,294 duction Expenses $\frac{d}{d}$ t Receipts from Farm Marketing Money Income and Inventory Change $e'$ 12,976 t Returns from Farming t Returns from Farming t Returns from Farming t Returns from Farming $\frac{33,406}{12,976}$ t Returns from Farming $\frac{10,253}{335}$ All values are measured in 1966 equivalent dollars corn 0\$1.25 per bushel, wheat 0\$1.50 per bushel, s in 1975. Level C - corn 0 0\$3.75 per bushel, wheat 0\$1.50 per bushel, s corn 0\$1.25 per bushel, wheat 0\$1.50 per bushel, s in 1975. Level C - corn 0 0\$3.75 per bushel and cotton 0\$0.34 per pound in 1 0\$3.75 per bushel, soybeans 0\$2.15 per bushel conto 0\$1.25 per bushel, soybeans 0\$2.15 per bushel t cotton 0\$50.24 per bushel, soybeans 0\$2.15 per bushel t cotto 0\$50.24 per bushel, soybeans 0\$2.15 per bushel t corts per pound in 1972. cents per pound and br Same as Wheat, Feed Grain and Cotton Programs used wheat 0\$1.25 per bushel, soybeans 0\$2.15 per bushel t conts per pound used to estimate cash ex	le 8. Farm income and government payments under alternative comparison. le 8. Farm income and government payments under alternative comparison. I the comparison of the second	le 8. Farm income and government payments under alternative price le comparison. Comparison. $Actual \frac{a}{A}$ $Actual \frac{a}{A}$ Atual 206 8,785 Aturns from Farming 43,294 44,218 47,2294 Aturns from Farming 43,297 611,668 8,765 8,765 Aturns from Farming 43,297 11,680 12,734 Atual Direct Programs $gAtu Nertor Payment Programs gAtu Nertor Payment Programs gAtu Nertor Program Payments 1,095 3,453 3,413 3,095 3,453 3,454 3,454 3,555 4,55 4,$	le 8. Farm income and government payments under alternative price levels in li comparison. comparison. $\frac{Actual a'}{1000} = \frac{Actual a'}{10000} = \frac{Actual a'}{10000000} = 1000000000000000000000000000000000000$	Le 8. Farm income and government payments under alternative price levels in 1975 with promotison. Comparison. Comparison. Comparison. Actual $\frac{3}{10}$ , $\frac{3}{1066}$ , $\frac{3}{1069}$ , $\frac{1}{10}$ ,	Le 8. Farm income and government payments under alternative price levels in 1975 with prior year comparison. The comparison is the prior payments of the prior payments of the prior part of the part of th

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 $\underline{e}/$  Includes the value of home consumption and the rental value of farm dwelling.

Wheat, Feed Grain, Cotton, Cropland Adjustment and Soil Bank Programs. <u>f</u>/ Includes ACP, Great Plains Conservation, Sugar Act and Wool Act payments. /ब

Table 9. Government payments required to maintain net farm income at recent year levels under a bargaining power program in 1975.

		1975 Pric	es
	Level A	Level B	Level C
	(	Million Doll	ars)
Net Farm Income	13,891	18,675	22,667
Government Payments Required			
1966 Net Farm Income	2,362	0	0
1968 Net Farm Income	1,251	0	0
1969 Net Farm Income	2,637	0	0

## Land Retirement Programs

Estimated net farm income for the annual land retirement program includes government payments for participation. The \$4.2 billion for price support and land retirement pushes net farm income above that for Level A prices and the actual 1968 level even though Comparison Level prices are below Level A prices (Table 8). However, if a long-term land retirement program was implemented (with unrestricted land diversion with production located in areas of greatest comparative advantage), net income would total \$16.6 billion, near the 1969 level, under the lower prices of the annual land retirement program. Estimated government payments to attain the implied amount and location of land retirement total \$2.0 billion. $\frac{23}{2}$ 

In summary, levels of net farm income realized in recent years could not be attained in 1975 solely through the mechanism of bargaining power with prices at Level A (assuming mandatory production controls to restrain supply and no payments). Government payments still would be necessary if 1966-69 net farm income levels were to be attained. If Level B or Level C prices were attained under bargaining power programs alone, both would result in net farm income exceeding that of any previous year. No government payments would be required to attain these levels of income but effective means of reducing supply to the levels consistent with Level B and Level C prices definitely would be required. A price level somewhere between Level A and Level B would yield net incomes at either the 1966 or 1969 level without supplemental government payments.

If prices lower than Level A were used, an annual land retirement program such as that summarized in the last column of Table 8 could be employed. This annual program has government payments totaling \$4.2 billion and net farm income of \$15.6 billion for 1975. Annual land retirement, long-term land retirement or a combination of the

<sup>23/</sup> Madsen, Heady and Nicol, Trade-Offs in Farm Policy. If net farm income and expenses for this long-term land retirement program were recalculated using the methods of this present study, net farm income would be reduced and probably would be more in line with the annual land retirement program.

two programs could be used to support prices at any of the levels reported in Table 8.24/ For bargaining power with mandatory acreage quotas used alone to attain the price level of the annual land retirement program in Table 8, net farm income is estimated at only \$11.4 billion. A lower income results because no government payments are included. The annual land retirement program would result in the same price level but higher net farm income because, as has been true for programs of the recent past, it includes a government outlay for farmers of \$4.2 billion as the necessary payments for voluntary participation. Hence, bargaining power that results in prices approaching those of the recent past (Table 1) still would require supplemental government payments to maintain net farm income.

## Additional Programs

Various types of voluntary land retirement programs, with government payments to attain sufficient participation and supply control, also could be used to attain the A, B and C price levels in Table 8.

An annual land retirement program used to attain Level A prices would require government payments estimated at \$5.5 billion in 1975. However, net farm income would be higher than for Level A prices with supply control through mandatory acreage quotas, since government payments are not included in the assumptions of the bargaining power program. Under a long-term retirement program analyzed elsewhere to include (a) unrestricted land diversion (whole farms and regions allowed), (b) land diversion in terms of comparative advantage and (c) Level A prices, net income is estimated at \$18.5 billion. $\frac{25}{}$ Government payments estimated at \$4.1 billion would be used, however, to attain voluntary participation of supply control consistent with Level A prices. Hence, a supply control program to allow attainment of a given level of prices will have more income associated with it

<sup>24/</sup> For an analysis of the effects when excess cropland is grazed for additional beef production, see Earl O. Heady, Howard C. Madsen and Leo V. Mayer, Analysis of Some Farm Program Alternatives for the Future, CAED Rpt. 34, Center for Agricultural and Economic Development, Iowa State Univ., 1969.

<sup>25/</sup> Madsen, Heady and Nicol, Trade-Offs in Farm Policy.

when organized as (a) a voluntary acreage reduction program with government payments rather than as (b) a bargaining power program based on mandatory supply control and without payments. On the other hand, bargaining power exercised to the extent of control attaining Level B and Level C prices would increase income greatly without government payments. Income would be increased in these instances with the source being only that of higher prices for food. Under voluntary supply control and its associated payments to attain the same level of prices, the total social costs would be greater. Not only is the price of food raised by the same amount to consumers but also large treasury payments are required to attain the necessary participation level.

## CONSUMER EFFECTS

Total consumer food expenditures associated with each of the three price levels are summarized in Table 10.26/ Estimated total food costs in 1975 range from \$121 billion under Comparison Level prices to \$137 billion under Level C prices.27/ Actual food costs were \$83 billion in 1966 and \$89 billion in 1969 but costs are expected to be higher in the future, regardless of the programs in effect. The increase is due to a larger population and growing per capita incomes and greater expenditures on food, especially for the service and convenience components of food.

## Alternative Price Levels and Food Costs

Food cost per capita is lowest under Comparison Level prices, \$544, and highest under Level C prices, \$617. However, the increase in food cost per capita between Comparison Level and Level C prices is only \$73 or 13.4 percent, but would bring these percentage increases in farm commodity prices: 66.7 percent for corn, 76.0 percent for wheat, 74.4 percent for soybeans, 55.6 percent for cattle and calves and 81.3 percent for hogs. Hence, a rather modest increase in per capita food costs, and one only comparable to the growing outlay as consumers voluntarily elect to spend more for packaging or other conveniences and services incorporated with food, can bring a much

<sup>26/</sup> See Appendix B for methods used to calculate food costs.

<sup>27/</sup> The Comparison Level prices are the same as used for the annual land retirement program in Table 8.

Table 10. Consumer f for compar	cood expend rison.	itures under	alternative	price levels	in 1975 with	ı prior years
	Act	$ual \frac{a}{a}$		1975	Prices <u>b</u> /	
	1966	1968	Level A	Level B	Level C	Comparison Levels
			FW)	illion Dollars		
Meat Products <sup>C</sup> /	24,452	26,643	53,182	57,260	61,719	49,498
Poultry and Eggs <sup>c/</sup>	6,548	6,466	9,130	10,556	12,099	8,187
Dairy Products	13,477	14,656	13,828	13,828	13,828	13,828
0ther <sup>d</sup> /	38,374	41,702	49,112	49,112	49,112	49,112
Total	82,851	89,467	125,252	130,756	136,758	120,625
Per Capita Costs	\$425	\$450	\$565	\$590	\$617	\$544
<u>a</u> / Source: Food Cor 1970.	sumption,	Prices and E	kpenditures,	Supplement fo	r 1968, USDA	r ERS, January

<u>م</u>	All values for 1975 are measured in 1966 equivalent dollars with no adjustment for inflation
	to 1975: Level A - Corn @\$1,25 per bushel, wheat @\$1.50 per bushel, soybeans @\$2.75 per
	bushel and cotton @\$0.28 per pound in 1975. Level B - Corn @\$1.50 per bushel, wheat @\$1.85
	bushel, soybeans @\$3.25 per bushel, and cotton @\$0.31 per pound in 1975. Level C - Corn
	@\$1.75 per bushel, wheat @\$2.20 per bushel, soybeans @\$3.75 per bushel and cotton @\$0.34
	per pound in 1975. See Table 1 for livestock prices associated with Levels A, B and C.
	Comparison Level assumes cattle and calves @\$22.5 cents per pound, hogs @\$18.2 cents per
	pound and broilers @\$15.3 cents per pound in 1975.

- For a breakdown of 1975 estimates see Appendix Table B-1. <u>े</u>।
- Includes fruits and vegetables, grain mill products, bakery products and miscellaneous items. <u>ज</u>

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larger increase in farm prices. Also, the Level C prices would increase net farm income by 45.6 percent over the Comparison Level prices (annual land retirement).

In absolute terms, the increase in net farm income between Comparison Level and Level C prices is \$7.1 billion. Total food cost rises \$16.1 billion, more than twice the gain in net farm income. But net farm income under Comparison Level prices includes \$4.2 billion in government payments. Under a successful bargaining power program and Level C prices, government payments are eliminated.

Food cost per capita increases \$21 or 3.9 percent between Comparison Level and Level A prices. But net farm income under Level A prices is below that for Comparison Level prices. From a total food cost and net farm income standpoint, consumers, taxpayers and farmers all would prefer the Comparison Level prices with net farm income of \$15.6 billion and total food cost of \$120.6 billion. Under Level A prices, net farm income is \$1.7 billion less and total food cost is \$4.6 billion more. Under Comparison Level prices, farmers have a higher net farm income and consumers and taxpayers save \$0.4 billion or the difference between the savings in food costs (\$4.6 billion) and higher government payments (\$4.2 billion).

Between Comparison Level and Level B prices, net farm income and total food cost increase by \$3.1 billion (20.2 percent) and \$10.1 billion (8.5 percent), respectively. Although the gain in net farm income (over Comparison Level prices) is more modest under Level B prices than under Level C prices, the rise in total food cost is also much more modest. A bargaining power program that achieved a price level somewhere between Level A and Level B prices could maintain net farm income at the same level as under Comparison Level prices at even a more modest increase in total or per capita food cost than occurs under Level B prices. Also, government payments would not be required for participation. But the rise in total food cost, even though modest, would exceed the savings in government payments (\$4.2 billion for Comparison Level prices).

Per capita food costs in 1975 will be higher than those of previous years, even with prices maintained at past levels, because of changes in consumption patterns associated with higher family incomes. As incomes of consumer rise, consumption is shifting away from pork, dairy products, eggs and grain products towards fresh fruits and vegetables, beef and veal, broilers and turkeys. Also, consumers respond rather flexibly in higher outlays for the service and convenience components of food as their incomes increase. The projected costs in Table 10 reflect these shifts in consumption and lead to higher food costs in 1975 even with Comparison Level prices.

## Some Trade-Offs

As discussed in the subsection on net farm income, a number of programs or methods could be used to attain specified or desired income or price levels. Included are farmer bargaining power, annual land retirement, long-term land retirement, government purchase of excess cropland or a combination of these and other programs.  $\frac{28}{}$  If the goal of policy makers is to maintain net farm income at a desired level, any of these programs can be used and the degree of supply control attained, along with the level of government payments, will determine net farm income, consumer food cost and Treasury outlay.

Hence, a number of trade-offs are possible in the nature and combination of farm programs that might be used to attain given levels of prices and (or) net farm incomes. A specific level of net farm income can be attained with lower levels of food costs and farm commodity prices and lower total social costs under a voluntary program that pays farmers for participating in supply control. Supply control and farm commodity prices can be less, for a given net farm income level, since part of net farm income is contributed through government payments. On the other hand, the total social costs for a given level of prices attained through voluntary supply control and government payments is greater than through bargained prices and mandatory supply control. For the program involving government payments, costs are involved in both, (a) the higher food prices to consumers and (b) government payments. Similarly, bargaining power to increase income could result in a lower level of food prices if it were attained in some combination with government payments to encourage participation in supply control activities.

<sup>28/</sup> For production and income effects of a government land purchase program, see Heady, Madsen and Mayer, An Analysis of Some Farm Program Alternatives for the Future.

Bargaining power as a means of attaining price and income goals can be successfully attained only if accompanied by effective supply control so that output conforms to demand at the implied price level. Supply control through government payments is easier to attain than mandatory output reduction through self-assigned quotas by farm organizations that must exercise controls over many thousands of producers dispersed over great geographic space.

Even with general types of farm programs, various alternatives exist and have their trade-offs in quantities important to various social, economic and geographic groups of the farm and general public. For example, land retirement can vary from (1) programs such as those of the recent past where contracts are on an annual basis and land diversion is on a fractional-farm basis spread over all producing regions, to (2) long-term land diversion concentrated regionally in terms of comparative advantage and on a whole-farm basis. Programs between these extremes also are possible. The costs of land retirement based on the first extreme require greater government payments than supply control based on the second extreme, even though the two result in the same levels of price and aggregate income for agriculture. The second extreme, however, implies greater social and community costs than the first, if applied during a short period, because it would cause the costs of adjustment to concentrate in particular localities and communities. $\frac{29}{}$ 

Each approach to farm policy has its gain in one direction and sacrifice in another. It is these gains and losses that farm communities, farm groups, program administrators and the public at large must weigh in choosing one or another program or in choosing a combination of two or more. It is possible that the general public would be unwilling to provide government payments at the level necessary to bring farm prices and net farm income to Level C indicated in the preceding analysis. As voluntary supply control is achieved through government payments, the costs increase as prices go higher, more productive land must be diverted and higher market

<sup>29/</sup> For a discussion of regional adjustment problems under alternative farm programs, see Madsen, Heady and Nicol, Trade-Offs in Farm Policy; Heady, Madsen and Mayer, An Analysis of Some Farm Program Alternatives for the Future and Leo V. Mayer, Earl O. Heady and Howard C. Madsen, Farm Programs for the 1970's, CAED Rpt. 32, Center for Agricultural and Economic Development, Iowa State Univ., 1968.

returns cause participation to become less favorable for individual farmers. It is possible, since high Treasury payments would not also be involved, that the higher levels of farm prices would be more acceptable to the general public if attained through farmer bargaining mechanisms that controlled supply without payments. This route to higher prices would differ little, if any, from attainment of the same goal by industries, such as those represented by automobiles, farm machinery and steel. The problem of effective supply control, however, is the major obstacle to be surmounted by farmer self-managed programs. Sizable price improvements themselves provide incentive for farmers to break away from schemes organized for this purpose.

These and other considerations must be used by farmers, the public, rural communities, consumers and public administrators in selecting optimal or acceptable policies. This study has been made to provide added information on which these decisions might be based. Only the groups affected by the many trade-offs among alternative policy and price improvement schemes can determine the appropriate weights to be applied to each. However, quantities relating to the costs, price and income effects must be gauged against these weights in arriving at efficient decisions.

## IMPLICATIONS FOR POLICY

The need for and potentials in agricultural policy revolve around a number of factors. First, the demand for farm products is inelastic and rapidly expanding farm output keeps farm prices and income from rising. Second, because of the spatial characteristics of farming, rural communities typically provide few athand nonfarm employment opportunities for persons being released rapidly from the industry. Third, educational facilities in the past have not been greatly geared to human adaptation and mobility in rural communities. Fourth, the labor market connecting agriculture with the rest of the economy has functioned imperfectly and with great lagged effects. <u>30</u>/

<sup>30/</sup> For a discussion of these factors and the role of agriculture in economic development, See Earl O. Heady, Agricultural Policy Under Economic Development, Ames, Iowa State Univ. Press, 1962; Leo V. Mayer, Earl O. Heady and Howard C. Madsen, Farm Programs for the 1970's, CAED Rpt. 32, Center for Agricultural and Economic Development, Iowa State Univ., 1968, and Earl O. Heady, A Primer on Food, Agriculture and Public Policy, New York, Random House, 1967.

Obviously, differences between bargaining power achieved through mandatory controls or land retirement by annual or long-term programs or other program alternatives are not "black and white" that alone can solve or meet all of these basic problems. Each program alternative has associated with it (1) a different amount and location of retired cropland and production or supply control, (2) varying geographic and economic distributions of government payments or income improvements and (3) large differences with regional location of agricultural adjustments. Accordingly, the choice among farm program alternatives need not be one of "either, or." A combination or mix of farm programs can greatly affect government costs, the time involved for solutions or adjustments and the location of land retirement.

The analysis of some potential bargaining power price levels in this study represents an attempt to provide data to which farm groups, the public and policy makers can attach their own weights in arriving at program choices. If any of these groups should decide that no government payments to farmers are desired, net farm income can be maintained at past levels only with prices substantially above present levels and with correspondingly higher food prices. Bargaining power alone, which holds farm prices only at previous levels, would result in reduced net farm income under the elimination of government payments to farmers for supply control. With rather modest increases in per capita food costs, bargaining power that in fact incorporated effective supply control could result in very sizable increases in farm prices and income -if the supply control implied were acceptable to farmers and "tight" enough.

Although supply control and higher prices through market bargaining or government administered programs could bring net farm income to the levels preferred by particular farm groups, programs centering around commodity prices provide no effective compensation for the many persons replaced from farming by rapidly changing technology. The use of more capital and technology through the decisions of individual farmers has brought rapid expansion in farm size and the process is continuing. A complete social policy for the entire rural community is needed to solve their problems. Both farm and nonfarm rural persons should be included since both are victims of the rapid technological changes under way in agriculture. Farmers, society and industry continue investing in technology which increases the supply capacity of agriculture. As illustrated in Table 11, the ongoing technological transformation of agriculture allowed total output to increase with reduced employment of cropland and

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Productivit		61	65	79	85	105	108	itat. Bul.
Total Farm Production Inputs		85	93	66	101	101	112	), USDA ERS, 9
Man-hours Labor Used		217	210	191	142	92	64	/ Report, 1970
Crop Pro- duction Per Acre	7-59 = 100)	69	64	80	84	109	129	cy: A Summary
Cropland Used for Crops	(1957	64	107	104	106	66	94	and Efficienc
Population		55	72	78	87	103	116	Production a
Total Farm Output		52	60	78	86	106	121	Changes in Farm 233, June 1970.
Year		1910-14	1930-34	1940-44	1950	1960	1969	Source:

<u> $\underline{a}$ </u> Output per unit of input.

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labor. New forms of capital technology have substituted for these resources and increased the productivity of farming.31/ These trends will continue.

With ongoing investments in new technological forms of capital, change is continuous and has differential effects on various groups in rural communities. Whether through alternative land retirement programs financed by the government or farmer bargaining programs that control supply without government participation, programs could be organized to free or add funds that then might be directed towards persons of the rural community who bear the truly great burden of change through loss of employment opportunities and income. Savings generated through particular program modifications could be used, along with additional funds to guarantee improved education, training, career guidance and employment generation in rural areas. More people then could be afforded positive economic opportunity.<sup>32</sup>/ Bargaining power with effective supply control as the means of price and income improvement could allow funds to be released for these purposes. The problem of inherent, excess supply capacity in agriculture would still not be solved by bargaining power programs that give farmers control over their prices. But bargaining power programs could place farmers more nearly on a parallel with other industries where producers are not "price takers."

- 31/ For a more detailed explanation of these forces and problems, see Earl O. Heady, Agricultural Policy Under Economic Development, Ames, Iowa State Univ. Press, 1962. Also see Leo V. Mayer, Earl O. Heady and Howard C. Madsen, Farm Programs for the 1970's, CAED Rpt. 32, Center for Agricultural and Economic Development, Iowa State Univ., 1968, and Earl O. Heady, A Primer on Food, Agriculture and Public Policy, New York, Random House, 1967.
- 32/ For a discussion of the gains and losses under technological change and suggested programs for farm and nonfarm people in the rural community, see Earl O. Heady, "Developing Economically and Politically Consistent Policies: The Problem of Equity," in Food Goals, Future Structural Changes, and Agricultural Policy: A National Basebook, Ames, Iowa State Univ. Press, 1969.

#### SUMMARY AND CONCLUSIONS

This study is one in a continuing series dealing with alternative farm policies. It includes simulation of a bargaining power program to attain three alternative price levels: Level A (\$1.50 wheat, \$1.25 corn and \$2.75 soybeans), Level B (\$1.85 wheat, \$1.50 corn and \$3.25 soybeans) and Level C (\$2.20 wheat, \$1.75 corn and \$3.75 soybeans). A fourth price level (\$1.25 wheat, \$1.05 corn and \$2.15 soybeans), termed the Comparison Level, is included in parts of the analysis for comparison. Commodities included in the analysis are wheat, feed grains, soybeans, cotton, cattle and calves, hogs, sheep, broilers and turkeys. The year 1975 is used as the time reference of the study.

The primary objective of this study is to estimate net farm income, food cost and supply control required under simulated bargaining power programs to attain the three alternative price levels. The study also attempts to answer these questions: (a) What level of prices for the major agricultural products is required to maintain producer net income at recent year levels when government price support and acreage diversion payments are eliminated? (b) What level of government transfer payments is required, for alternative price levels, to maintain producer net income at recent year levels? The price levels chosen are not recommended levels but have been selected, among the many possible, to indicate considerations involved in using bargaining power to attain various price levels for major agricultural commodities.

A successful bargaining power program would require effective means to restrain supply to market demand at higher price levels. Since the demand for most farm commodities is inelastic, an increase in farm prices will increase aggregate farm income. But when farm prices rise, there is more incentive for farmers to increase output. Market demand quantities move in the reverse direction, decreasing as prices rise. And the higher prices rise, the tighter must be the restraints on production. For example, to achieve Level A prices in 1975, which are above the 1966-69 average level, total feed grains acres are 2.6 million fewer than the 1969 actual acreage. And in 1969 about 59.0 million acres were retired in various land retirement programs. Under Level C prices, the highest price level studied, feed grains acres must be reduced 19.1 million (20.0 percent) below 1969 actual or 16.5 million fewer acres than under Level A prices. Similar changes are evident for soybeans. To achieve Level A prices, total soybean acres must be reduced 4.5 million below 1969 actual. To achieve Level C prices, soybean acres must be reduced 15.2 million (37.2 percent) below

1969 actual or 10.7 million fewer acres than under Level A prices.

The control levels implied could lead to a successful bargaining power program for agriculture, although supply control implemented without government land retirement programs would require legal authority and mechanisms that do not exist. Because of the nature of demand, however, a successful bargaining power program could raise net farm income. Income gains for farmers could be very substantial if supply were reduced so that prices were raised as much as 70 percent above the 1966-69 average. For the price levels included in this study, net farm income ranges from \$13.9 billion under Level A prices, in the absence of government price support and land retirement payments to farmers, to \$22.7 billion under Level C prices.

Since net farm income (in the absence of government payments) under Level A prices in 1975 is below the average 1966-69 level, government payments would be required to maintain the 1966-69 levels. Under Level A prices, net farm income could be maintained at the 1966 level only with government payments to farmers of \$2.4 billion; to maintain net farm incomes at the 1968 level would require government payments of \$1.3 billion and at the 1969 level payments of \$2.6 billion. Net farm incomes under both Level B and Level C prices are above those of all previous years. Therefore, a bargaining power program that achieved a price level somewhere between Level A and Level B could maintain net farm income at the 1966, 1968 or 1969 level without government subsidy payments.

Net farm income for Comparison Level prices (\$1.25 wheat, \$1.05 corn and \$2.15 soybeans), with an annual land retirement program financed by the government, is estimated at \$15.6 billion and is above that of Level A prices, a simulated bargaining power program without government payments. But, the annual land retirement program for Comparison Level prices includes \$4.2 billion in payments, with prices and payment rates structured as in recent years. Of course, bargaining power also could be used to maintain prices below Level A, but net farm income would be correspondingly lower (about \$11.4 billion for the Comparison Level prices).

It is evident that with a bargaining power program and lower prices, such as Level A or those of recent years, net farm income would not increase. Such a program would only replace the supply control effects of present government programs and Treasury payments to farmers would be eliminated. With higher prices, such as those represented by Level C, net farm income is increased even without government payments. The price increase more than offsets the elimination of government payments. Although government subsidy payments are not required under this bargaining power program, exports of farm products are projected to decline and food costs to rise modestly as prices increase.

Food cost per capita for 1975 is lowest under Comparison Level prices, \$544, and highest under Level C prices, \$617. But farm prices and net farm income under Level C prices are substantially above similar measures for Comparison Level prices. In other words, the higher price level results in farm prices averaging 70 percent higher and net farm income 46 percent higher with an increase in total food costs of only 13.4 percent over Comparison Level prices. In absolute terms, the increase in net farm income between Comparison Level and Level C prices is \$7.1 billion. Total food costs rise \$16.1 billion, more than twice the gain in net farm income. At the same time, net farm income for the Comparison Level prices includes \$4.2 in government price support and land retirement payments. With a successful bargaining power program, these payments are eliminated.

For Level A and Level B prices the increase in total or per capita food cost is much more modest (over Comparison Level prices), although the increase in total food cost under both Level A and Level B prices is more than the amount of government payments under Comparison Level prices (\$4.2 billion for an annual land retirement program). Net farm income under Level A prices, however, is \$1.7 billion less and under Level B prices, net farm income is \$3.1 billion or 20.0 percent more than under Comparison Level prices. A price level somewhere between Level A and Level B prices could maintain net farm income at the same level as under Comparison Level prices but the rise in total food cost, even though modest, would exceed the amount of government payments under Comparison Level prices (an annual land retirement program).

The effects of a given program on the farm price level, net farm income and food cost depend on the nature of the program or the combination of programs that might be used. Supply control through a government program that includes payments for participation can attain a given level of net income with lower prices, lower food costs and lower total social costs, where costs are represented by lower prices to consumers but higher payments from the Treasury. A higher level of prices and food costs is implied for the same net farm income under a bargaining power program, and the total social costs are higher where costs entail only the higher food prices to consumers. But the increase in total food costs under a successful bargaining power program will always exceed the savings in Treasury payments from elimination of the government payment program.

On the other hand, total social costs to attain a given level of prices are always more for supply control through government programs and payments because the price of food is raised by the same amount to consumers and large Treasury payments are required to attain the necessary participation. Under a successful bargaining power program, only the total cost of food is higher.

Land retirement programs of the recent past have an advantage in the sense that they spread the burden of land retirement over the entire country. A mandatory supply control program of the type implied in this study and necessary for a successful bargaining power program to increase net farm income, would have this same advantage since acreage quotas used are based on historical acreages of the major crops. However, long-run supply control and considerably higher prices under a bargaining power program would encounter certain major difficulties. These include:

- 1. The large number and the great geographical dispersion of producers make it difficult to maintain discipline and to administer controls. Some producers feed the grains, others sell and some do both, making policing difficult.
- 2. Pressures to bring new lands into production as supply controls are tightened and the price level rises are always in the background.
- 3. Depending on the price level attained, there might be incentive to develop new products as substitutes for those being controlled.
- 4. Adverse effects on foreign trade, both in reducing exports and in increasing imports as the price level is increased, are imminent prospects.
- 5. Adequate controls must exist to prevent producers outside the bargaining framework from supplying the market. Hence, an increasing degree of monopoly power must be attained by farmers as production controls are tightened and prices are raised further.
- 6. Reducing eventual market supply of some agricultural products is difficult. Animals continue to grow and production is continuous over a holding period. Hence, supply control best may come through restraints in planting and breeding.
- 7. Members of the bargaining groups must be able to withstand financial hardships if a "strike" is called. Since unemployment payments available to labor unions do not exist for agricultural producers, many producers could not afford this financial loss unless substitute mechanisms were developed.

8. Present laws do not exempt agricultural producers from antitrust legislation if prices are raised too high.

A number of alternative methods, programs or combinations of programs could be used to attain a desired price or income goal: farmer bargaining programs, annual land diversion programs, longterm land retirement programs, government purchase of excess cropland and others. Any of these programs can be used and the degree of supply control exerted, along with the level of government payments forthcoming, will determine net farm income and consumer food cost. Each program has associated with it a different freedom of decision, location of retired cropland, geographic distribution of government payments and income, and regional location of agricultural adjustments. It is information on these effects that policy makers and the general public should use to decide on the desired program or combination of programs. The magnitude of the trade-offs involved among different programs and the weights that farmers, government administrators and the general public attach to attainments of each provide the parameters needed for improved policy decisions.

APPENDIXES

#### APPENDIX A

Total production expenses are equal to cash plus fixed expenses. Cash expenses include: feed costs, livestock purchases, fertilizer and seed, petroleum and fuel, building repairs, hired labor, other vehicle operation and miscellaneous costs. Fixed expenses include: depreciation on buildings and equipment, taxes, interest on real estate and rent. No formal methods were used to estimate fixed expenses in this study. Equations 1 through 7 were used to estimate cash expenses:

Feed Costs (t value in parentheses)  $\hat{Y}_{FCt} = -24,594.472 + 299.680Q_{Lt} - 203.196Q_{Ct-1} + 212.480\frac{Q_{Ct-1}}{(2.32)Q_{Lt}}$ (1)F Ratio = 81.58 $R^2 = 0.94$ Livestock Purchases  $\hat{Y}_{LPt} = -1514.196 + 15.633Q_{Lt-1} + 33.195Q_{(2.98)} (1.62) (5.74)$ (2)F Ratio = 105.42 $R^2 = 0.92$ Fertilizer and Seed  $\hat{Y}_{F,St} = -285.007 + 0.922Y_{F,St-1} + 8.485T_{(1.19)} (9.01)$ (3)F Ratio = 395.36  $R^2 = 0.98$ Retroleum and Fuel  $Y_{P,Ft} = 392.163 + 0.658Y_{P,Ft-1} + 2.197T_{(2.48)} + (4.38)^{P,Ft-1} + (1.60)^{P,Ft-1}$ (4) F Ratio = 72.29 $R^2 = 0.89$ 

Other Vehicle Operation No equation estimated Building Repairs  $\hat{Y}_{BRt} = 690.078 + 0.528Y_{BRt-1} - 5.814T_{(-3.01)}$ (5) F Ratio = 152.85  $R^2 = 0.95$ Hired Labor  $Y_{Lt} = \frac{2437.559 + 0.752Y}{(1.49)} + \frac{0.752Y}{(5.07)} + \frac{-27.356T}{(-1.50)}$ (6) F Ratio = 320.02 $R^2 = 0.97$ Miscellaneous Cost  $\hat{Y}_{Mt} = -1031.280 + 0.831Y_{Mt-1} + 27.420T_{(-1.94)} (7.44) + (1.95)$ (7)F Ratio = 1264.00 $R^2 = 0.99$ where  $Q_{Lt} = Index of livestock production, 1966=100.$  Constructed by adding together liveweight production of cattle and calves, hogs and sheep.  $Q_{L,t-1}$  = Lagged value of  $Q_{L,t}$  $Q_{Ct}$  = Index of crop production, 1966=100. Constructed by adding together feed units of wheat, feed grains and soybeans produced.  $Q_{Ct-1}$  = Lagged value of  $Q_{Ct}$ 

 $T = Time; 49, 50, \ldots, 69.$ 

Equations 1 and 2 were estimated from 1949-69 data while equations 3 through 7 were based on 1950-1969. Appendix Table A-1 summarizes actual values for each of the dependent variables in equations 1 through 7, their total for the years 1950-1969 and the predicted total for 1950-1969.

Costs estimated for 1975 from equations 1 and 2 were obtained by placing estimates of crop and livestock production for 1975 into the right hand sides of the equations and obtaining resulting estimates on the left hand sides. For equations 3 through 7, starting with 1969 values of each variable and T = 70 on the right hand sides of the equations, estimates for the left hand sides in 1970 were obtained. These estimates for 1970 and T = 71 were then used to obtain estimates for 1971. The process stopped when the estimates for 1975 were obtained.

The estimate for total cash expenses in 1975 is then the adding together of each individual cost estimate from equations 1 through 7 for each price level studied, plus other vehicle operation at its mean value 1949-1969.

Year	Feed Pur- chased -	Livestock <sub>b</sub> / Purchased <sup>b</sup> /	Fertilizer, Lime & Seed Costs <u>c</u> /	Petroleum & Fuel Costs <u>d</u> /	Other Vehicle Operation Costs e/	Building Repairs <u>f</u> /	Hired Labor <u>£</u> /	Miscel- laneous Costs $\underline{h}/$	Actual Total <u>i</u> /	Predicted Total
				Ð	Million Dolla	cs)				
1950	3,385	1,909	1,556	1,416	1,824	805	5,192	1,934	18,021	17,534
1951	3,802	1,904	1,613	1,418	1,968	801	4,879	2,119	18,504	18,146
1952	3,734	1,793	1,678	1,452	2,141	847	4,459	2,073	18,177	18,294
1953	3,590	1,714	1,673	1,480	2,079	834	4,186	2,091	17,647	18,262
1954	3,756	1,978	1,707	1,492	2,006	822	3,996	2,132	17,889	18,428
1955	4,000	1,973	1,721	1,514	2,066	819	3,978	2,306	18,377	19,010
1956	4,099	2,236	1,745	1,520	2,180	793	3,868	2,405	18,846	19,037
1957	4,339	2,388	1,709	1,498	2,196	785	3,846	2,412	19,173	18,900
1958	4 <b>,</b> 990	2,729	1,754	1,489	2,167	754	3,887	2,584	20,354	19,654
1959	5,351	2,720	1,855	1,501	2,210	758	3.697	2.818	20.910	20.863
1960	5,531	2,690	1,876	1,503	2,056	717	3,636	2,926	20,935	21,019
1961	5,690	2,935	1,934	1,484	1,909	710	3,646	3,002	21,310	21,210
1962	6,126	3,202	2,021	1,500	1,979	706	3,522	3,206	22,262	21,365
1963	6,451	3,171	2,125	1,487	1,967	689	3,467	3,377	22,734	22,282
1964	6,080	2,988	2,286	1,534	1,895	677	3,300	3,554	22,314	22,617
1965	6,052	3,237	2,378	1,547	1,951	699	3,072	3,641	22,547	22,570
1966	6,324	3,498	2,578	1,570	1,992	665	2,889	3,854	23,370	23,063
1967	6,604	3,496	2,777	1,585	2,080	685	2,667	4,023	23,917	24,156
1968	6,377	4,094	2. <b>,</b> 802	1,582	2,106	638	2,607	4,217	24,423	24,516
1969	7,057	3,661	2,791	1,596	2,069	624	2,481	4,336	24,615	24,736
Mean (49-49	, 5,072	2,667	2,001	1,502	2,033	743	3,733	2,899		
Stands Devia- tion (49-49	1,257	722	432	57	112	70	766	798		
Footno	tes are (	on page 57.								

Appendix Table A-1. Cash expenses, actual and predicted total, 1950 to present.

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- $\underline{a}$ / Deflated by prices paid for feed, 1966=100.
- $\underline{b}$ / Deflated by prices paid for livestock, 1966=100.
- $\underline{c}$ / Deflated by prices paid for fertilizer, lime and seed, 1966=100.
- $\underline{d}$ / Deflated by prices paid for motor supplies, 19 $\hat{6}6=100$ .
- e/ Deflated by prices paid for farm machinery, 1966=100.
- Deflated by prices paid for building and fencing materials and building materials, house, 1966=100. <u>f</u>/
- $\underline{g}$ / Deflated by wages paid hired farm labor, 1966=100.
- Deflated by prices paid for farm supplies, 1966=100. Miscellaneous costs include interest on non-real-estate debt, pesticides, electricity, irrigation, milk hauling, veterinary services and medicine. /प
- i/ Source: Farm Income Situation, USDA ERS, July 1970.

## APPENDIX B

Total food costs were estimated from projections to 1975 of individual food items including beef and veal, pork, lamb and mutton, broilers, turkeys, eggs, dairy products, fruits and vegetables, grain mill products, bakery products and miscellaneous items.

Consumer expenditures in 1975 for beef and veal, pork, lamb and mutton, broilers, turkeys and eggs were estimated from Equation 1:

$$E_{i75} = (P_{iR75}) (C_{i75}) (N_{75})$$
(1)

where

E<sub>i75</sub> = Consumer expenditure for i-th commodity in 1975 i = 1,..., 6
P<sub>iR75</sub> = Retail prices of i-th commodity in 1975 in 1966 equivalent
dollars
C<sub>i75</sub> = Per capita consumption of i-th commodity in 1975
N<sub>75</sub> = Population estimate for 1975

Consumer expenditure for dairy products was estimated from Equation 2:

$$E_{d75} = (E_{d66}) \left( \frac{C_{75}}{C_{66}} \right) \left( \frac{P_{175}}{P_{166}} \right) \left( \frac{N_{75}}{N_{66}} \right)$$
(2)

where

 $E_{d75} = \text{Consumer expenditure for dairy products in 1975}$   $E_{d66} = \text{Consumer expenditures for dairy products in 1966}$   $\frac{C_{75}}{C_{66}} = \text{Per capita consumption of all dairy products in 1975}$   $\frac{P_{175}}{P_{166}} = \text{Consumer price index for all dairy products in 1975}$  $\frac{N_{75}}{N_{66}} = \text{Population estimate for 1975 divided by actual 1966}.$  Expenditures for fruits and vegetables, grain mill products, bakery products and miscellaneous food costs were estimated from Equation 3:

$$E_{j75} = \left[1 + 11 \ (\overline{\Delta C_E})\right] \ (\overline{C_E}) \ (N_{75})$$
(3)

where

$$\begin{split} E_{j75} &= \text{Consumer expenditure for j-th commodity group in 1975} \\ j &= 1, \dots, 4 \\ \hline \Delta C_E &= \text{Average per capita change in consumer expenditure for } \\ \hline C_E &= \text{Average per capita consumer expenditure for j-th commod-ity group 1960-68} \\ \hline N_{75} &= \text{Population estimate for 1975} \\ 11 &= \text{Number of years (1964-1975)} \end{split}$$

Appendix Table B-1 gives estimates for each commodity estimated from Equations 1, 2 and 3.

		19	975 Prices	
	Level	Level	Leve1	Comparison
Item	Α	В	С	Leve1
		(Mill	lion Dollar	s)
Meat Products	53,182	57,260	61,719	49,498
Beef and Veal	36,816	39,295	41,951	34,641
Pork	14,987	16,622	18,390	13,572
Lamb and Mutton	1,379	1,343	1,378	1,285
Poultry and Eggs	9,130	10,556	12,099	8,187
Broilers	5,328	6,594	7,981	4,485
Turkeys	1,052	1,212	1,368	952
Eggs	2,750	2,750	2,750	2,750
Dairy Products	13,828	13,828	13,828	13,828
Other	49,112	49,112	49,112	49,112
Fruits & Vegetables	24,123	24,123	24,123	24,123
Grain Mill Products	3,943	3,943	3,943	3,943
Bakery Products	10,092	10,092	10,092	10,092
Miscellaneous	10,954	10,954	10,954	10,954
TOTAL	125,252	130,756	136,758	120,625

Appendix Table B-1. Estimated consumer expenditures for individual commodities under alternative price levels in 1975.a/

All values are measured in 1966 equivalent dollars with no adjustment for inflation to 1975: Level A - Corn @\$1.25 per bushel, wheat @\$1.50 per bushel, soybeans @\$2.75 per bushel; cattle and calves @24.0 cents per pound, hogs @20.0 cents per pound, broilers @17.0 cents per pound and lambs @22.0 cents per pound. Level B-Corn @\$1.50 per bushel, wheat @\$1.85 per bushel and soybeans @\$3.25 per bushel; cattle and calves @30.0 cents per pound, hogs @27.0 cents per pound, broilers @22.0 cents per pound and lambs @28.0 cents per pound. Level C - Corn @\$1.75 per bushel, wheat @\$2.20 per bushel and soybeans @\$3.75 per bushel; cattle and calves @35.0 cents per pound, broilers @28.0 cents per pound, hogs @33.0 cents per pound, broilers @28.0 cents per pound and lambs @35.0 cents per pound. Comparison Level - Corn @\$1.05 per bushel, wheat @\$1.25 per bushel and soybeans @\$2.15 per bushel; cattle and calves @22.5 cents per pound, hogs @18.2 cents per pound and broilers @15.3 cents per pound.

## APPENDIX C

This study is based on a linear programming model with 150 producing regions and 31 demand or consuming regions. Production of wheat, feed grains, soybeans and cotton is included explicitly in the model. Livestock production is converted into feed equivalents and incorporated implicitly. Given a set of crop prices, crop production costs and transportation costs, the programming model maximizes the net return of farmers subject to: (a) cropland available, (b) demands estimated for the given prices and (c) acreage quotas necessary to restrain supplies to the estimated demands.

In abbreviated form, the programming model can be shown as:

$$Maximize f(r) = rx'$$
(1)

where the x's are subject to the restraints

$$Ax' \leq b' \tag{2}$$

$$\mathbf{x} \ge \mathbf{0} \tag{3}$$

Maximizing (1), there exists a set of x's (levels of production, transportation and transfer of wheat for feed) that will satisfy the restraints (2) on cropland available, estimated demands, and acreage quotas to restrain supplies to estimated demands. When this model is solved for a unique x, the acreage and location of wheat, feed grains, soybeans and cotton in the 150 producing regions are specified.