Impact of the Set-Aside Program on the U.S. Wheat Acreages

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Five factors are found to have had a significant effect on U.S. acreage of wheat planted during 1961-74: (1) acreage allotment, (2) additional diversion for payment through 1970, (3) set-aside acres in 1971-73, (4) relaxation of allotment restrictions, and (5) the market price of wheat for the preceding season. Together, these factors explain over 98 percent of the wheat acreage variation during 1961-74. The wheat set-aside program reduced wheat planting by 0.28 acre for each acre set aside in the winter wheat regions and by 0.62 acre for each acre set aside in the spring wheat region. It reduced the U.S. acreage of wheat planted by 0.41 acre for each acre set aside nationally.

Keywords: Agricultural policies, wheat, set-aside, production response, supply function, T-regression analysis.

Wheat producers in the United States have been affected by various Government commodity programs for a number of years. Although specific requirements and options of the programs have varied, in general they have relied upon restricting the land input as the means of controlling overproduction. Since 1961 two major types of programs, the acreage allotment-diversion and the set-aside programs, have been in effect. Eligibility for benefits under these two programs has required significant adjustments in producers' decisions to plant wheat.

Since participation in the more recent wheat programs has been voluntary rather than mandatory, national agricultural planners and policymakers have faced the increasingly difficult task of predicting producer response under a wide range of program options and market conditions (*1, 5, 6, 9*). For example, over the past 14 years the market price of wheat has varied from below the loan level to more than triple the loan level. July 1 wheat stocks have ranged from a high of over 1.4 billion to a low of under 200 million bushels. During this period, wheat programs have changed from nearly mandatory acreage allotment programs to voluntary general cropland diversion programs based on the set-aside concept. The voluntary nature of participation in the set-aside program, as well as its provisions allowing producers to plant any crops after meeting the set-aside requirements, has led to increased difficulty in predicting wheat acreage responses to adjustments in program provisions.

Nevertheless, the current U.S. and world wheat situation makes it imperative that policymakers have accurate estimates of future wheat acreage as affected by changing market prices and alternative program specifications. Should wheat set-aside be required? If so, what response is expected under alternative set-aside acreages? How will producers respond to the current market prices? The answers to these and many similar questions are essential ingredients for accurate policy decisionmaking.

Objectives of the Analysis

Since passage of the Agricultural Act of 1970, 3 years of experience have been recorded regarding production response to alternative set-aside program provisions. While a data base covering a much longer period of years would be most helpful, statistical estimates of program response can be made using available data. The two objectives of this analysis are (1) to develop a predictive model using historical data and program characteristics that will identify the major policy variables affecting the acreage of wheat planted since 1961, and (2) to obtain a statistically accurate estimate of the impact of changes in set-aside acreage on the acreage of wheat planted. As will be shown in the results section, models developed to accomplish the first objective may not be the most efficient for meeting the second; hence it is useful to consider the objectives separately, though they are closely related.

Programs and Factors Affecting Wheat Plantings

Two major acts of Congress affecting wheat are under consideration in this study. The first is the wheat allotment-diversion program encompassed in the Food and Agriculture Act of 1965 and in effect from 1966 through 1970. The second is the set-aside program established by the Food and Agriculture Act of 1970 for the 1971-73 crop years and substantially extended in 1973 for the 1974-77 crop years. The "emergency" or 1-year programs enacted for the 1962-65 crops may be viewed as modifications of the 1965 act for purposes of this analysis.[1]

[1] A summary of these programs has been compiled by Hadwiger (*4*).

Under the diversion programs, participating wheat producers were given acreage allotments which served as upper limits on their plantings. For specific years, participation in the programs offered the additional option of diverting acres below that allotment for additional payments. In certain instances overplanting of allotments was also allowed. Producers participating in these programs were required to withhold land from wheat by diverting to fallow or conserving uses. Compliance with program requirements insured producer eligibility for program benefits which included use of the loan support option and receipt of diversion payments for specific years.

Under the set-aside program, participating producers were required to withdraw cropland from production. However, any crop or crops could be planted as long as the normal conserving base and set-aside acreage were maintained. Benefits accruing to participants included use of the loan support program and receipt of certificate payments as a compensation for the required set-aside. In 1972 and 1973 payments were also made for voluntary set-aside above the minimum required.

Though the diversion and set-aside programs may appear quite similar, there is a significant difference between them. While the diversion program idled wheat allotment acres, the set-aside program idled acres from total cropland on the farm as a unit. Because of this, it may be hypothesized that the diversion and set-aside programs had differing impacts upon acreage planted to wheat, with diversion having the larger relative effect.

Though the Government policies considered apply to all wheat, there is a basis for an additional distinction between fall and spring planted wheat. Farmers planting winter wheat have the option of declaring certain acres, seeded to wheat in the fall, to be diversion or set-aside during the following spring. Hence, fall planted acres that are damaged by weather or disease are often classified as diversion or set-aside. Winter wheat regions may thus show a large diversion or set-aside acreage without a corresponding decrease in planted acreage. No such option is generally available to the spring planting producers, who decide at planting time their planted and set-aside acreages. Therefore, it is hypothesized that each acre of diversion or set-aside in the spring wheat areas reduces planted acres to a greater extent than a similar idle acre in the winter wheat areas.

Statistical Models and Data Used

The hypothesized structure for the statistical model includes the influences of five factors on the acreage planted to wheat: (1) the national acreage allotment, (2) acres diverted for payment through 1970, (3) set-aside acres in 1971-73, (4) relaxation of allotment restrictions, and (5) the average market price of wheat during the preceding season.

The timing of passage of major farm legislation and the announcement of various annual options has also been critical in influencing the impact of these programs on acres planted. In some cases, new programs were announced after substantial portions of the wheat crop were already planted. Therefore, the hypothesized model takes into account the timing of passage of the legislation and announcement of options. Likewise, separate estimates are made for spring wheat States and winter wheat States to recognize the differing impacts of the programs under these circumstances.

The functional form selected for the predictive model is linear in both parameters and variables:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + e$$

where

Y = acres planted to wheat (1,000 acres)

X_1 = U.S. wheat acreage allotment (1,000 acres)

X_2 = optional or additional diversion of allotment acres under the diversion programs (1,000 acres)

X_3 = total acres of wheat set aside under the set-aside program (1,000 acres)

X_4 = average price received by farmers for wheat during the previous season (constant 1967 dollars)

X_5 = dummy variable representing the change in the model structure accompanying removal of acreage allotments

X_6 = dummy variable representing the removal of marketing quota penalties from the allotment program and allowing substitution of wheat for feed grains

e = stochastic error term.

Data used for the models come from published U.S. Department of Agriculture sources (*11*) and cover the period 1961-74 (table 1). Experience prior to 1961 is of little value in improving model estimates because only one of the program variables considered, the wheat acreage allotment, was in effect during this period and the allotment was fixed at 55 million acres. Such experience is considered by including 1961 in the analysis.

Special explanation of several of the variables and relationships is useful to understand the model. For 1961-70, acreage allotments were allocated to participating wheat producers. These allotments served as upper limits for producer plantings and are represented by the variable X_1 in table 1. For 1962 the allotment is adjusted downward to 49.5 million acres, the announced 55-million-acre national allotment less a 10 percent mandatory diversion required in that year. Beginning with the implementation of the set-aside program in 1971, acreage allotments were no longer used as a limit for wheat plantings and a zero value is given to X_1 for these years. A dummy variable X_5 is

Table 1. Data used in estimation of regression equations

Year	Acres planted Y	Wheat allotment X_1	Additional diversion X_2	Wheat set-aside X_3	Lagged price X_4	No allotment X_5	Relaxed allotment X_6
	1,000 acres				*Dol.*		
All wheat:							
1961	55,707	55,000	0	0	1.96	0	0
1962	49,274	[a]49,500	[b]6,125	0	2.04	0	0
1963	53,364	55,000	7,200	0	2.25	0	0
1964	55,672	53,200	776	0	2.02	0	0
1965	57,361	53,300	2,356	0	1.47	0	1
1966	54,105	51,500	1,939	0	1.43	0	1
1967	67,264	68,200	0	0	1.68	0	1
1968	61,860	59,300	0	0	1.39	0	1
1969	53,450	51,600	4,311	0	1.19	0	1
1970	48,739	45,500	3,639	0	1.13	0	1
1971	53,810	33,670	0	3,870	1.14	0.26	0.74
1972	54,896	0	0	20,106	1.10	1	0
1973	59,008	0	0	7,240	1.41	1	0
1974	[c]70,077	0	0	0	2.93	1	0
Winter wheat States:[d]							
1961	41,118	40,159	0	0	1.95	0	0
1962	36,450	[a]36,043	[b]4,502	0	2.00	0	0
1963	40,173	40,017	5,160	0	2.21	0	0
1964	41,671	39,216	714	0	2.00	0	0
1965	42,676	39,309	1,883	0	1.45	0	1
1966	40,444	37,900	1,819	0	1.41	0	1
1967	50,450	50,217	0	0	1.68	0	1
1968	45,311	43,656	0	0	1.36	0	1
1969	39,425	37,983	3,482	0	1.15	0	1
1970	35,678	33,490	2,806	0	1.10	0	1
1971	35,984	33,670	0	0	1.12	0	1
1972	39,571	0	0	12,857	1.11	1	0
1973	41,169	0	0	2,780	1.36	1	0
1974	[c]48,215	0	0	0	2.71	1	0
Spring wheat States:							
1961	14,589	14,841	0	0	2.03	0	0
1962	12,824	[a]13,457	[b]1,623	0	2.37	0	0
1963	13,191	14,983	2,040	0	2.37	0	0
1964	14,001	13,984	62	0	2.12	0	0
1965	14,685	13,991	473	0	1.53	0	1
1966	13,661	13,600	120	0	1.49	0	1
1967	16,814	17,983	0	0	1.71	0	1
1968	16,549	15,644	0	0	1.49	0	1
1969	14,025	13,617	829	0	1.32	0	1
1970	13,061	12,010	833	0	1.24	0	1
1971	17,826	0	0	3,870	1.25	1	0
1972	15,325	0	0	7,249	1.09	1	0
1973	17,839	0	0	4,460	1.52	1	0
1974	[c]21,862	0	0	0	3.37	1	0

[a]Announced wheat allotment of 55 million acres reduced by the mandatory diversion requirement of 10 percent that existed for farmers participating in the program.

[b]Total diversion less the mandatory diversion estimated as 11.11 percent of the participating allotment.

[c]Total of winter wheat from the December 1973 Winter Wheat Report and spring wheat from Prospective Plantings, January 1974.

[d]Winter wheat States include all States except North Dakota, South Dakota, Minnesota, and Montana.

incorporated in the model to account for the normal or equilibrium level of wheat planting in those years in which there was no limiting wheat acreage allotment.[2]

As defined in the model, the X_2 variable represents the diversion of allotment acreage only, thereby reducing a participating farmer's limit on wheat planting to his allotment less this optional (additional) diversion. It was hypothesized that this more restrictive definition of diversion would better explain changes in wheat acreages for years in which a wheat allotment was in effect. Thus the diversion shown in table 1 represents only those acres of allotment voluntarily diverted for payment. Since published data for 1962 also include the mandatory diversion required of all participants, it was necessary to subtract the estimated mandatory diversion from the published value to estimate X_2 for this year.

Variable X_4 is the previous year's season average price received by farmers in constant 1967 dollars.[3] Although use of the previous year's price implies a rather naive farmer price expectation process that may not apply equally to both spring and winter wheat, such price data are readily available. Also, the use of separate methods of representing price expectations for the different types of wheat would destroy the direct comparability of results, as will be discussed later.

Finally, the dummy variable X_6 represents a hypothesized shift in planted acreage during the allotment program resulting from removal of marketing quota penalties and allowing wheat to be planted on the feed grain base. During 1961-63, marketing quota penalties required that overplanting producers pay the Federal Government between 45 and 65 percent of the parity price per bushel on as mush as twice the normal yield for any nonallotment acres planted, and also made them subject to reductions in future allotments as penalties for noncompliance. Although the marketing quota penalty was removed in 1964, the provision for loss of allotment history was retained and deterred plantings to some extent. Beginning with 1965 this penalty was also terminated and a substitution provision made available to wheat producers, allowing them to plant wheat on their feed grain base. Dummy variable X_6 was given a value of one during 1965-70 to recognize these relaxations in allotment restrictions, and was given a value of zero for all other years.

Separate models were estimated for winter wheat, spring wheat, and all wheat. Table 1 shows the data used for the different categories. Data for diversion and set-aside are available for individual States but are not available by winter and spring wheat subgroups. Therefore, all wheat in the major spring wheat producing States was used to represent the spring wheat region. The four States with the largest acreages of spring wheat—North Dakota, Minnesota, South Dakota, and Montana—were thus defined as spring wheat States for the purpose of estimating the spring wheat submodel.

The data for 1971 require special explanation. Since the Food and Agriculture Act of 1970 was not passed until November 1970, long after the date when winter wheat had been planted, only the spring wheat farmers (approximately 26 percent) had an opportunity to adjust planting decisions in accordance with the provisions of the new act. Therefore the 1970 allotment was assumed for estimation of the model in the winter wheat States for 1971 (table 1), in accordance with the hypothesis that winter wheat farmers expected a continuation of the previous program. No allotment was included in the 1971 data for spring wheat States, where farmers had full knowledge of the new set-aside program at planting time. The 1971 set-aside acreage for all wheat includes the set-aside for the spring wheat States only. Finally, the dummy variables X_5 and X_6 take correspondingly different values for spring wheat and winter wheat in 1971. For all wheat, these variables become the weighted average of spring and winter wheat, that is, 0.26 for X_5 to denote removal of the allotment from 26 percent of the wheat and 0.74 for X_6 to denote the relaxed version of the allotment for winter wheat.

Analysis of Results

Results of the estimated regression equations are shown in table 2. The top portion of the table lists results of the final equations selected for predictive purposes. The lower section of the table presents regression results applicable to the objective of measuring the set-aside impact.

The estimated coefficients have the expected signs when compared to the results of similar studies (*1, 8, 9, 10*). For the first three predictive equations, the R_2 values are in the neighborhood of 98 percent and the standard error of the estimate is less than 1 million acres. The standard errors of the individual regression coefficients are generally small in comparison to the coefficients themselves. Using the traditional F-test, all of the coefficients except for set-aside are significant at the 0.01 level in equation (1) for all wheat.[4] The coefficients in the remainder of the equations are generally significant at least at the 0.05 level.

[2] Independent variables that are in effect during only part of the years analyzed need to be accompanied by a zero-one dummy variable to avoid biasing the regression coefficient estimate with data from other years. For example, see (*8*, p. 328).

[3] Prices were adjusted on the basis of the consumer price index. While there are arguments in favor of using the index of prices paid by farmers for this purpose, the high correlation between the two indexes and the nature of the farm firm-household relationship suggest no clear advantage for either.

[4] The standard F-tests for significance used here may tend to overstate the reliability of these coefficients, particularly the regression coefficient for set-aside, $\hat{b}_3$. Since only 4 years of set-aside data are used in estimating the coefficient, it appears intuitively that less than the standard degrees of freedom should be used in the F-test. However, the authors were unable to determine the appropriate degrees of freedom to use in such cases.

Table 2. Summary of regression results from 1961-74 U.S. wheat data

Equation number	Dependent variable $\hat{Y}$	Constant $\hat{a}$	Wheat allotment $\hat{b}_1$	Additional diversion $\hat{b}_2$	Wheat set-aside $\hat{b}_3$	Lagged price $\hat{b}_4$	No allotment $\hat{b}_5$	Relaxed allotment $\hat{b}_6$	Equation F	R_2	Standard error of estimate	Price elasticity
Estimates for the full model:												
1	All wheat	14,035.96	.55393	−.68014	−.19624	6,002.75	38,236.86	5,870.30	87.2	98.7	953.0	0.17
			(.06364)	(.14004)	(.12531)	(1,279.85)	(4,131.41)	(1,093.94)				
			***	***		***	***	***				
2	Winter wheat States	3,948.91	.69085	−.37119	−.05050	4,912.43	30,793.84	4,237.91	63.0	98.2	790.4	0.19
			(.06664)	(.15035)	(.12456)	(953.49)	(2,961.82)	(850.08)				
			***	*		***	***	***				
3	Spring wheat States	5,300.46	.57376	−.68841	−.78820	349.97	15,349.82	940.65	58.2	98.0	479.5	0.04
			(.11559)	(.26117)	(.21460)	(598.88)	(2,090.81)	(539.28)				
			***	*	***		***					
Price impact removed from data:												
4	All wheat	15,479.28	.62219	−61239	−.41326		43,453.08	4,089.61	61.2	97.4	1,127.3	0.10
			(.06366)	(.16081)	(.07799)		(3,825.59)	(757.34)				
			***	***	***		***	***				
5	Winter wheat States	5,367.80	.77355	−.30497	−.28472		34,685.25	2,580.03	36.9	95.8	1,021.9	0.10
			(.07447)	(.19126)	(.10681)		(3,256.34)	(674.27)				
			***		*		***	***				
6	Spring wheat States	4,791.43	.53303	−.75294	−.62066		14,268.90	1,304.72	64.3	97.6	472.0	0.10
			(.10391)	(.24632)	(.09127)		(1,650.61)	(332.19)				
			***	**	***		***	***				

Numbers in parentheses below the coefficients are standard errors.
Significance of the coefficients is indicated by the following convention: *.05, **.025, ***.01.

Note the differences between the coefficients in table 2 when all wheat is separated into the winter wheat and spring wheat subsets. The set-aside coefficient, though not significant in the winter wheat areas, is quite significant in the spring wheat region. This result, coupled with the lower coefficient value for diversion in the winter wheat as contrasted to the spring wheat equation, lends support to the hypothesized less precise relationship of set-aside and diversion to planted acreage in the winter wheat areas. On the other hand, the price coefficient is very significant in the winter wheat equation but is not significant in the spring wheat equation. An explanation of this outcome is found in considering the multicollinearity between the two variables.

Regression equations (1), (2), and (3) exhibited symptoms of high multicollinearity between the set-aside and price variables. Although the equations can be considered satisfactory for predictive purposes, they provide little toward meeting the second objective of this study—that is, obtaining an estimate of the true set-aside impact. For 1971-74, when the set-aside program was in effect, set-aside and the lagged price have a very high correlation.[5] When equations (1), (2), and (3) were recomputed omitting set-aside (or price), the price (or set-aside) regression coefficients varied considerably. Since the other characteristics of the equation remained virtually unchanged, multicollinearity between the set-aside and price variables is further indicated by this result. In such a situation, the $\hat{b}$ estimates for the variables involved are suspect and the available statistical tests for significance generally overstate their accuracy.

Statistical theory suggests three alternative techniques for overcoming such problems: (a) the use of additional observations, (b) use of other functional forms omitting one of the variables, or (c) utilizing exogenous or a priori information to estimate one of the variables (7). For this analysis, the third technique represents the only practical alternative.

Since the objective of this study was to provide a first estimate of the set-aside coefficient, it was decided to use an a priori estimate of the impact of the price variable. Other studies of short-run price elasticity of wheat acreage response have estimated values in the range of 0.10 to 0.20 (*2, 3*). A value of 0.10 was selected for this analysis because this value represents, as closely as any, what could be considered a consensus as to the true elasticity.

The regression coefficients for price implied by an elasticity of 0.10 were then computed. The resulting coefficients were multiplied by the price variable X_4 in table 1 and this quantity was subtracted from the dependent variable, acres planted. Data for these revised

Table 3. Revised acreage data with a priori price impact removed[a]

Year	All wheat	Winter wheat	Spring wheat
		1,000 acres	
1961	48,977	36,131	12,826
1962	42,270	31,335	10,766
1963	45,639	34,521	11,133
1964	48,736	36,556	12,160
1965	52,314	38,968	13,356
1966	49,195	36,838	12,367
1967	61,496	46,153	15,329
1968	57,087	41,833	15,255
1969	49,364	36,484	12,879
1970	44,859	32,865	11,984
1971	49,896	33,120	16,740
1972	51,119	36,732	14,378
1973	54,167	37,691	16,519
1974	60,017	41,284	18,935

[a]Each of the revisions is based on a wheat acreage price elasticity of 0.10.

dependent variables are shown in table 3.[6] The adjusted acres planted were regressed on the same variables as the original equations (excluding the price variable) to obtain the adjusted regression equations shown as equations (4), (5), and (6) in table 2.

The estimates for b_3 in the second set of regression equations appear reasonable, are close to the levels expected, and are significant statistically. Again the contrast between the diversion and set-aside coefficients and the winter and spring wheat areas is noteworthy. In both equations, the set-aside coefficient is of a smaller magnitude than that for the diversion variable, reflecting a smaller impact in reducing acreage planted to wheat. Similarly, coefficients for both variables in the winter wheat equation are smaller than those in the spring wheat equation, again verifying the smaller impact of these programs on winter wheat producers' fall planting decisions.

Performance of the model is demonstrated by figure 1, which shows the actual acreage of all wheat planted as well as the estimated acreage based on equation (1). The equation (1) estimate for 1975 is also shown, assuming a 1974 season average price of $4 (equivalent to $2.71 in

[5]This result may suggest that policymakers follow the "cobweb" response hypothesis by declaring a high set-aside acreage in years following a low price and a low set-aside following a year with high prices.

[6]For the linear form of a regression equation, the formula for elasticity is $\epsilon = bX/Y$. Evaluated at the means, the formula becomes $\epsilon = b\bar{X}/\bar{Y}$ or $b=\epsilon\bar{Y}/\bar{X}$. In this example, the all-wheat coefficient implied by an elasticity of 0.10 is calculated at $b_4 = 0.10 \times 56751.21/1.65286$ or $b_4 = 3433.52$.

Multiplying the price for each year by this coefficient and then subtracting from the dependent variable yields a revised dependent variable with the estimated price impact removed. For example, the revised dependent variable for all wheat in 1961 is computed as follows: $55707 - 3433.52 \times 1.96 = 48977$. The other coefficients computed similarly were b_4 (winter wheat) = 2557.56 and b_4 (spring wheat) = 868.48.

U.S. wheat acreage planted, actual and estimated

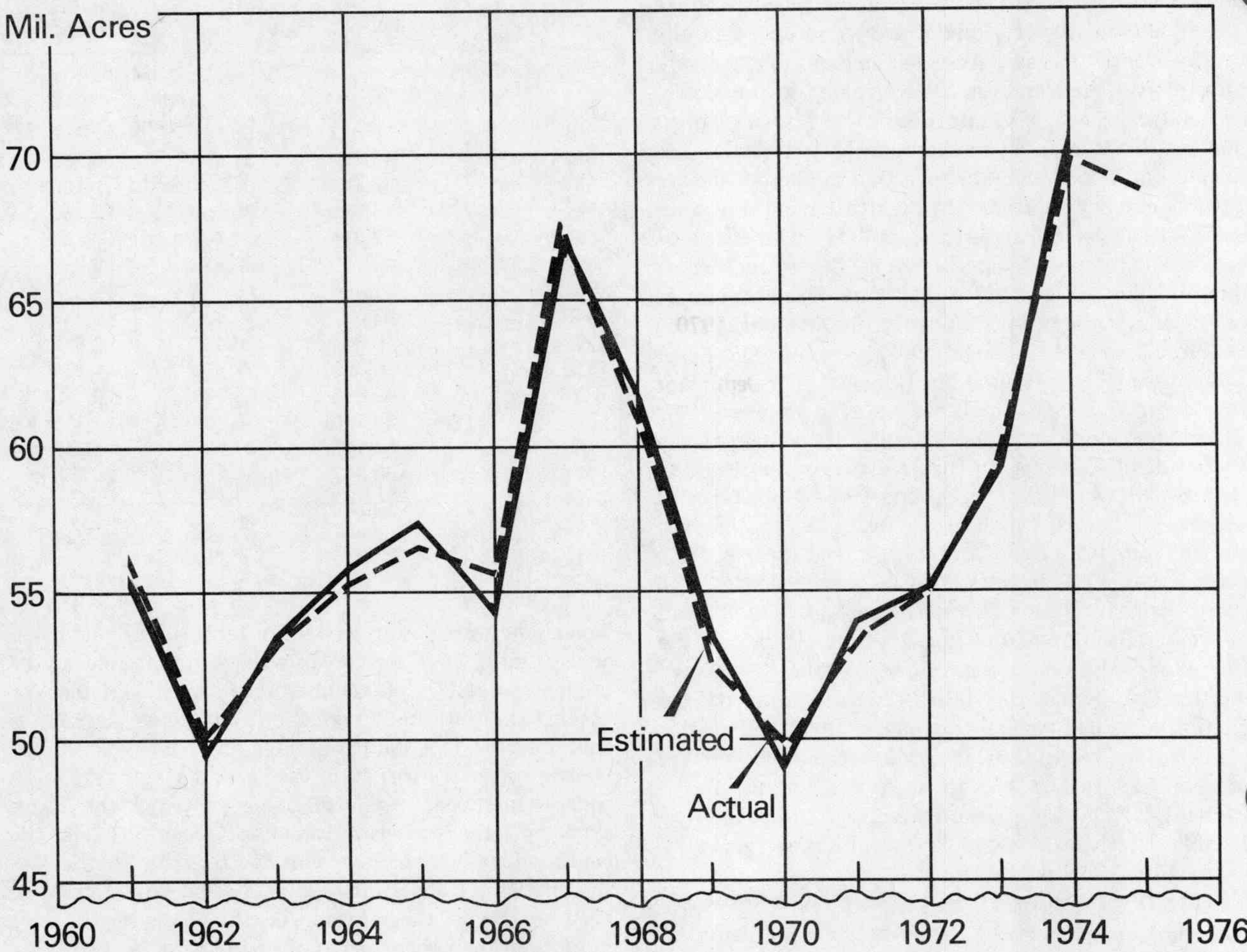

Figure 1

constant 1967 dollars) and no set-aside requirement. The 1975 estimate of 68.5 million acres is 1.5 million acres lower than the 1974 intended acreage of 70 million acres.

Summary

Regression results from the six equations indicate that for 1961-70 each acre of additional diversion under the Government wheat program reduced total wheat plantings by about 0.61 acre. For 1971-74 each set-aside acre of wheat reduced acreage planted to wheat by about two-thirds of that for the diversion programs, about 0.41 acre per acre set aside.

For the winter wheat region, the set-aside and diversion programs have been about equally effective in reducing planted acres. In this region, a reduction of somewhat less than one-third acre in plantings has been associated with 1 acre of diversion or set-aside. In the spring wheat regions, the wheat set-aside program has been slightly less effective than the diversion programs. However, in the spring wheat region both programs have had more than double the impact they have had in the winter wheat region, with each acre of diversion reducing plantings by about 0.75 acre and each acre of set-aside reducing plantings by about 0.62 acre. Over the historical period analyzed, the diversion programs were more effective than the set-aside programs in reducing acreage planted to wheat.

In conclusion, the hypothesized models fit historical data well and reasonable estimates of the set-aside impact are obtained. However, as with the use of most models of this type, predictions of future impacts should be examined with some skepticism, particularly when they rely on data outside the range of that used in the regressions.

References

(1) Blakeslee, Leroy. "Statistical Estimation of the Effect of Post World War II Farm Policy on U.S. Planted Wheat Acreage." Proc., 44th Annual Mtg., Western Agr. Econ. Assoc., Squaw Valley, Calif., July 1971, pp. 62-65.

(2) Bowlen, B. J. "The Wheat Supply Function." *J. Farm Econ.* 37:1177-85, December 1955.

(3) Cochrane, Willard. "Conceptualizing the Supply Relation in Agriculture." *J. Farm Econ.* 37:1161-76, December 1955.

(4) Hadwiger, Don F. *Federal Wheat Commodity Programs.* Iowa State Univ. Press Ames, 1970.

(5) Hoffman, Robert G. "Wheat—Regional Supply Analysis." *Wheat Situation*, U.S. Dept. Agr., Econ. Res. Serv., WS-255:15-24, August 1973.

(6) Houck, J. P., and M. E. Ryan. "Supply Analysis for Corn in the United States: The Impact of Changing Government Programs." *Am. J. Agr. Econ.* 54:184-191, May 1972.

(7) Johnston, J. *Econometric Methods*. McGraw-Hill, New York, 1963, pp. 201-207.

(8) Lindman, Russell, and D. Lee Bawden. "The Impact of Government Programs on Wheat Acreage." *Land Econ.* 10:327-335, November 1974.

(9) Miller, Thomas A. "The Relationship of Wheat Planted To Wheat Allotments in the Great Plains." *Agr. Econ. Res.* 20:57-63, April 1968.

(10) Sharples, Jerry A., and Rodney L. Walker. "An Analysis of Shifts in Cropland Use in the North Central Region." Unpublished manuscript, February 1974.

(11) U.S. Department of Agriculture. *1972 Set-Aside Programs Annual Report* (and previous issues under similar titles). Agr. Stabilization and Conservation Serv., February 1973.