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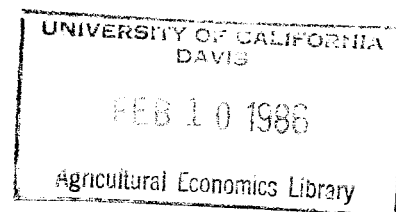
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**The Western Grain Stabilization Program:  
An Application on Certain U.S. Field Crops**



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# ABSTRACT

This study investigates the implications of replacing current commodity programs for seven major U.S. field crops with programs styled after the Western Grain Stabilization Program (WGSP) found in Canada. These commodities are: barley, corn, cotton, rice, sorghum, soybeans, and wheat.

Given the same external stimuli, computer model simulations to the year 1990 compare possible future producer net receipts for the above crops under three policy options: a continuation of present commodity programs, their elimination, and their elimination and replacement with a WGS-like program. Important points concerning each WGS-like program fund account and associated Government program costs are highlighted.

The Western Grain Stabilization Program:  
An Application on Certain U.S. Field Crops

Many 1985 farm bill proposals sharply lower commodity loan and target levels. The Administration's proposal reduces loan and target price levels to 75 percent of the previous three-year average of market prices for all commodities by 1991 and extends these provisions through to the year 2000 (AAA of 1985). Regardless of the exact form, 1985 farm legislation will almost certainly bring about less restrictive Government policies which would allow more price and income uncertainty in U.S. agriculture.

Alternative mechanisms to lessen the uncertainty include increased reliance on futures and options trading, more forward contracting, a move towards greater market concentration and vertical integration, the establishment of quasi-governmental marketing boards, farm revenue insurance plans, and variations of the Western Grain Stabilization Program (WGSP). The purpose of this paper is to describe the WGSP and to compare producer net receipts through 1990 for major food and feed grains, given three scenarios: (1) current commodity programs are maintained at "moderate" support levels, (2) all current programs are eliminated, and (3) current commodity programs are phased out during a two-year period and then replaced by WGS-like programs. Fund accounts and Government program costs associated with each WGS-like program are also compared.

### The Western Grain Stabilization Program

The WGSP is a Canadian agricultural program enacted in 1976 to help stabilize net returns to grain producers in the Western Provinces of Canada. Essentially, the program establishes a fund maintained by regular annual producer and Government contributions and is authorized to make producer payments, given certain area-wide conditions. The program is voluntary with farmer participation rates averaging about 75 percent. All producers of wheat, oats, barley, rye, flax, rapeseed/canola, and mustard in the Western Provinces of Canada are eligible. Program funding consists of participating producers' contributions set at 1.5 percent of their gross receipts from grain marketings (with a maximum of \$900 per year per producer), and Government contributions set at two percentage points above producer contribution levels 1/. Government funding also encompasses administrative costs (averaging about \$1.5 million per year) and interest charges on negative fund balances (Canada, 1984). Fund withdrawals are triggered when the area-wide net cash receipts from the current crop year's grain marketings (compared either on an area-wide aggregate basis or on an area-wide basis weighted by yearly marketings) are below the average of the previous five years. The actual payment received by any one producer is based on the producer's relative contribution (compared to all producers) to the fund during the previous three years.

The program has been considered "successful" by many because it presently has nearly \$1 billion in its fund account, exposes the Government to a fairly modest and predictable budget outlay, appears to have little effect in reducing Canada's competitiveness in world grain markets, and apparently does not contribute to surplus production. However, growing

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1/ Producer contribution levels (and thus, Government contribution levels) can be administratively adjusted upward or downward depending upon fund balance account levels.

producer dissatisfaction with the program's failure to make a payout since 1978 and the advantageous marketing conditions facing Canada in the early 1980's (the U.S.-U.S.S.R. grain embargo, strong U.S. dollar, and improved Canadian transportation facilities) make any final judgment on the success of the WGSP presumptuous.

Each WGS-like program to be adopted by U.S. sorghum, rice, barley, wheat, corn, soybean, and cotton sectors in this analysis assumes that:

- o program funding is based on 2 percent of gross grain receipts;
- o the Government matches each \$1 of producer contribution with \$2 and (in addition) pays all interest charges on negative fund accounts;
- o payouts are based on comparing current net receipts with the previous 5-year average; and
- o producer participation rates are initially assumed to be 100 percent 2/.

Along with the specifications of the exact type of WGS-like program, an external set of market conditions facing all scenarios is outlined. This set of conditions will determine the total value of marketings and total variable production costs: the main determinants in triggering payouts and calculating contribution levels of a WGS-like program. The methodology and assumptions concerning all scenarios are stated below, followed by comments specific to each scenario.

Basic Assumptions and Methodology--All future estimates of planted and harvested acreages, yields, and prices were derived from a recent USDA study (O'Brien and Fulton). These estimates were made from a combination of methods consisting of computer simulations tempered by

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2/ Participation rates were found to have a monotonic increasing relationship with fund contributions and payouts under each WGS-like program such that fund balances reported in this study would be exactly cut in half, given a 50 percent participation rate.

the judgment of USDA-ERS country/commodity analysts. To construct historical series, various USDA sources were used (USDA, 1983, 1982).

In all scenarios, macroeconomic conditions were assumed constant: that is, only harvested and planted acreages, yields, and prices were allowed to change given the policy shift away from current commodity programs.

Production cost outlays were derived by multiplying the projected planted acreages times the projected variable costs, for 1985 through 1990 (USDA, 1984). The same per acre variable cost estimates were used in both the base and "program eliminated" scenarios. Differences in aggregate cash outlays between scenarios for any commodity are due solely to planted acreage differences.

I. Baseline Scenario--For all commodities, current programs are maintained with target prices and loan rates frozen at 1984 levels and acreage reduction programs used to slow supply growth. Under this scenario, market conditions caused net receipts to drop over time for most commodities (table 1).

II. Program Elimination Scenario--Current programs are eliminated in 1986 and after open market prices reach trigger levels set at 110 percent of the 5-year moving average market prices, the initial stocks of the following commodities are released into the market: wheat -- 1 billion bushels; corn -- 700 million bushels; barley -- 100 million bushels; cotton -- 2.5 million bales; and rice -- 40 million hundredweight. For most commodities, program elimination caused higher acreages to be planted and harvested, lower average yields, lower average prices, and reduced net receipts (table 2).

Table 1.--Average Yearly Changes in Selected Variables  
in the Baseline Simulation, 1984-1990.<sup>1/</sup>

Item	Barley	Corn	Cotton	Rice	Sorghum	Soybeans	Wheat
	- - - - -Percentage Change from 1984 to 1990- - - - -						
Planted Acres	-1.6	NC	-.5	NC	NC	+6	-.4
Harvested Acres	-1.7	-.1	-.6	-.1	-.1	+6	-.8
Yield	+2	+9	-.3	+3	+3	+5	+4
Total Prod.	-1.5	+8	-.9	+2	+2	+1.1	-.3
Price	+8	+6	+8	+8	+8	+5	+5
Total Revenue	-.7	+1.4	NC	+1.0	+1.0	+1.6	+2
Total Variable Costs	+6	+2.4	+1.6	+2.1	+2.1	+2.6	+1.8
Net Receipts	-3.6	NC	-5.5	-2.3	-2.3	+8	-4.1

NC = only minor change.

<sup>1/</sup> Baseline represents a scenario where current commodity programs are maintained at "moderate" support levels (see text).

Source: O'Brien and Fulton.

Table 2.--Average Yearly Change from Baseline Selected Variables  
When Current Commodity Programs are Eliminated, 1986-1990.<sup>1/</sup>

Item	Barley	Corn	Cotton	Rice	Sorghum	Soybeans	Wheat
	- - - - -Percent- - - - -						
Planted Acres	+6.2	+2	+6.9	+14.1	NC	+2.1	+2.8
Harvested Acres	+6.6	+4.6	+7.1	NC	+2.6	+2.7	+9.2
Yield	-1.7	-2.9	+1.4	-1.3	-1.4	-1.7	-3.5
Total Prod.	+4.8	+1.6	+8.6	-1.3	+1.2	+1.0	+5.4
Price	-5.9	-6.7	NC	-25.2	-4.9	-3.1	-7.2
Total Revenue	-1.1	-5.2	+8.7	-26.1	-3.7	-2.2	-2.0
Total Variable Costs	+6.4	+1.9	+6.5	+14.0	NC	+2.0	+2.9
Net Receipts	-20	-18.8	+22.1	-152.0	-17.2	-5.4	-17.0

NC = only minor change.

<sup>1/</sup> Baseline represents a scenario where current commodity programs are maintained at "moderate" support levels (see text).

Source: O'Brien and Fulton.



III. Program Elimination plus a WGS-like Program--Marketings and cash outlays generated under scenario II were used to establish historical and future net receipt estimates. These estimates were arranged in a WGS-like program ledger in a LOTUS-123 computer worksheet to simulate the necessary program calculations which determine present and future fund receipts, withdrawals, and balance accounts 3/.

#### Empirical Results

##### Producer Net Receipts with a Continuance of Current Commodity Programs

Baseline estimates of producer net receipts indicate a stable, but slightly declining, trend during 1984 through 1990 for most commodities (table 3) 4/. Declines occur in the wheat, barley, cotton, and sorghum sectors; some growth occurs in the corn, rice, and soybean sectors.

##### Producer Net Receipts with an Elimination of Current Commodity Programs

Producer net receipts are lower than the baseline in all commodities except cotton, given the same external stimuli that were present in the baseline simulation, and the elimination of current programs in 1986. Variability in receipts nearly doubles for most commodities. The greatest drop in net receipts occurs in the rice sector where average receipts become negative. The barley, corn, sorghum, and wheat sectors experience drops in average net receipts between 11 and 13 percent. Only minor adjustments occur to the soybean sector. The cotton sector actually registered an increase in average net receipts as a result of the policy shift away from current programs to one without them.

3/ This computer worksheet is available from the author upon request.

4/ These baseline estimates are not USDA official estimates: they are presented here only for comparison purposes only.

Table 3.--Average Producer Net Returns,  
Their Coefficients of Variation, and Time Trends  
for Seven U.S. Field Crops Under Three Policy Options, 1984-1990

Item	Commodity						
	Barley	Corn	Cotton	Rice	Sorghum	Soybeans	Wheat
	- - - - - (Millions of Dollars) - - - - -						
<u>Baseline Estimates 1/</u>							
Net Marketing Receipts	376.7	8,269.2	666.3	341.9	431.4	8,838.5	2,328.7
Coefficient of Variation in Net Returns 2/	(percent)						
	.20	.10	.52	.16	.16	.08	.23
Yearly Change 3/	-.08	+.007	-.11	+.058	-.061	+.028	-.10
	- - - - - (Millions of Dollars) - - - - -						
<u>Program Elimination 4/</u>							
Net Receipts	328.1	7,175.7	748.9	-41.4	382.9	8,492.1	2,079.8
(Percentage change from baseline)	(-13)	(-13)	(+12)	(-112)	(-11)	(-4)	(-11)
Coefficient of Variation in Net Returns	(percent)						
	.34	.19	.45	-6.32	.39	.10	.32
Yearly Change	.088	-.027	-.046	-2.19	.025	+.026	-.09
	- - - - - (Millions of Dollars) - - - - -						
<u>Current Program Elimination with a WGS-like Program 5/</u>							
Net Receipts	392.5	7,083.1	847.1	208.6	456.4	8,245.9	2,879.7
(Percentage change from baseline)	(+4)	(-14)	(+27)	(-39)	(+6)	(-7)	(+24)
Coefficient of Variation in Net Returns	(percent)						
	.22	.13	.28	1.14	.22	.09	.31
Yearly Change	-.10	-.04	-.09	-.527	-.08	+.024	-.145

1/ Baseline estimates assume that current programs are maintained with target prices and loan rates frozen at 1984 levels and acreage reduction programs used to slow growth in supply.  
2/ Coefficients of variation is computed from the standard deviation of this time series divided by its mean value. 3/ 1984-1990 trend is the value of the slope of the regression line of net receipts regressed on time divided by average net receipts. 4/ Program elimination assumes current programs are eliminated in 1986 and assumes, that after open market prices reach trigger levels set at 110 percent of the 5-year moving average market price, the initial stock of the following commodities are released into the market: wheat--1 billion bushels; corn--700 million bushels; barley--100 million bushels; cotton--2.5 million bales; and, rice--40 million hundredweight. 5/ Separate WGS-like programs are established for each commodity in 1984 (2 years before current program elimination) with the following program specifications: program funding is based on 2 percent of gross grain receipts; the Government matches each \$1 of producer contribution with \$2 and (in addition) pays all interest charges on negative fund accounts; payouts are based on comparing current net receipts with the previous 5-year average; producer participation rates are initially assumed to be 100 percent; and, net receipts consist of producer net receipts under deregulation

Producer Net Receipts With Current Programs  
Replaced With WGS-like Programs

Producer net receipts, given this policy shift, were always more stable and sometimes higher than net receipts occurring in simulations with program elimination. In this scenario, producer net receipts include the marketing receipts realized in the "program eliminated" market plus fund transactions (payouts minus producer fund contributions). For the barley, cotton, sorghum, and wheat sectors, baseline stability in net receipts is restored due to fund payouts by their WGS-like program. Increases in their average net receipts are due to declining marketing receipts being bolstered by fund payouts. Payouts made to producers in these sectors greatly offset their fund contributions. Corn and soybean producers sustain lower net receipts than those realized in "program eliminated" conditions because their fund contributions far exceeded fund payouts. (It should be noted, however, that 1990 cumulative fund balances for each these commodities exceeded \$8 billion, so producer fund contributions could have been lowered drastically.) Stability was regained in the rice sector through the operation of its WGS-like program; however, average net receipts are lower than baseline estimates due to the large size of net receipt declines incurred by program elimination.

Comparison of Fund Accounts and Government  
Program Costs for Each Commodity

Comparison of Fund Accounts

The 1990 cumulative estimates of fund withdrawals and total contributions confirm the severe adjustment problems expected to be associated with the elimination of current programs. However, although most commodities recorded severe drops in net marketing receipts (as reported in table 1), all commodity WGS-like programs, except for barley, rice, and wheat (table 4), had positive 1990 fund balances. Due to both its large industry

Table 4.--1990 Cumulative and 1984-1990 Average Yearly Estimates  
of Selected WGS-like Program Parameters for Seven U.S. Field Crops 1/

Item	Crop						
	Barley	Corn	Cotton	Rice	Sorghum	Soybeans	Wheat
	<u>Millions of Dollars</u>						
<u>Cumulative Totals</u>							
<u>UND RECEIPTS</u>							
Producers	169.8	3,109.9	577.9	156.8	253.5	2,134.1	1,149.9
Government	414.5	6,219.7	1,175.8	798.0	597.6	4,268.1	3,946.4
Interest Earned	-58.9	2,067.0	43.5	-484.5	-81.9	1,974.6	-1,646.6
Total	525.4	11,396.6	1,797.2	470.3	769.2	8,376.8	3,449.7
<u>FUND WITHDRAWALS</u>							
Total	621.0	2,462.0	1,265.0	1,907.0	768.0	411.0	6,749.0
<u>FUND BALANCE</u>							
Total	-95.6	8,934.6	532.2	-1,436.7	1.2	7,965.8	-3,299.3
<u>Average Yearly Totals</u>							
Producers							
Contribution	24.3	444.3	82.6	22.4	36.2	304.9	164.3
Fund							
Withdrawals	88.7	351.7	180.7	272.4	109.7	58.7	964.1
Yearly							
Balance	-13.7	1,276.4	76.0	-205.2	.2	1,138.0	-471.3
Sector's Average							
Yearly Receipts							
from Marketings	1,213.1	22,213.3	4,127.6	1,119.9	1,810.4	15,243.3	8,213.9
	<u>Percent</u>						
<u>Avg. Prod. Contr.</u>							
Avg. Fund Withdrawals	.27	1.26	.46	.08	.33	5.19	.17
<u>Avg. Fund Withdrawals</u>							
Avg. Marketing Receipts	.073	.016	.044	.24	.06	.004	.117

1/ The WGS-like programs for the above commodities have the following general guidelines:  
(a) program funding is based on 2 percent of gross grain receipts; (b) Government funding matches each \$1 producer contribution with \$2 and also pays all interest charges on negative fund accounts; (c) payouts are based on comparing current net receipts with the previous 5-year average; and, (d) producer participation rate is 100 percent.

size and the extent of needs, the wheat sector recorded the largest absolute level of fund withdrawals--needing nearly a \$1 billion income transfer per year during 1984-1990--in order to bolster net receipts so that they were not below previous 5-year averages. This level of payouts forced the fund to accrue a yearly debt of \$471 million during 1984-1990. The rice sector incurred the most severe debt position (about \$200 million per year) relative to industry size. Its WGS-like program payouts cut net receipt drops in half and moved negative average returns to positive returns. In so doing, fund payouts amounted to about 25 cents for every \$1 of rice marketed, on average. Still, producer receipts were almost 40 percent below baseline estimates (refer back to table 3).

#### Government Program Costs for the WGS-like Programs

Total Government program costs vary according to industry size and extent of withdrawals relative to fund account levels. Government costs were held at about 4 cents for every dollar of marketing in sectors which did not incur substantial withdrawals at time of low fund accounts (table 5). In other words, Government funding levels were held at their matching fund obligation levels which amounted to 4 percent of marketings with participation rates set at 100 percent. Government funding levels could be expected to be less in the real world, given lower participation rates and automatic adjustments downward in contribution levels in any fund's money accounts running high surpluses.

#### Conclusions/Implications

Many farm bill proposals advocate a move away from current commodity programs. In the event that this move is realized, other forms of risk-bearing and resource adjustment tools will emerge. Commodity sectors that appear to be most vulnerable to severe variable drops in net receipts brought about by program elimination are U.S. wheat, rice, and barley sectors.

Table 5.--Average Yearly Government Costs Associated with Each WGS-like Program; Totals and as a Percentage of Average Net Receipts and Average Marketings, 1984-1990.

Item	Commodity						
	Barley	Corn	Cotton	Rice	Sorghum	Soybeans	Wheat
	-Millions of Dollars-						
Avg. Yearly Total Government Cost <u>1/</u>	59.2	888.5	168.0	114.0	85.4	609.7	563.8
Matching Fund Obligation	48.5	888.5	165.1	44.8	72.4	609.7	328.6
Interest Payment Account	10.7	0	2.9	69.2	13.0	0	235.2
	Percent						
Government Cost as a Percent of Net Receipts <u>2/</u>	.151	.125	.198	.547	.187	.074	.196
Government Cost as a Percent of Marketings	.049	.04	.041	.102	.047	.04	.069

1/ Includes Government program funding set at \$2 for each \$1 of producer contribution plus any monies needed to pay for interest charges on negative fund accounts: does not include an estimate of Government funding needed to pay for administrative costs for any program. 2/ Average net receipts consist of net receipts from marketings in the "program eliminated" market plus fund payouts minus producer fund contributions.

One tool that provides some protection from abrupt changes in net receipts due to changes in prices, area-wide yields, and for input costs is the WGSP. In simulations for the seven U.S. field crops in 1986-1990 market conditions where current programs are eliminated, producer net receipts were raised for most commodities and were made more stable in all cases with the addition of a WGS-like program. Thus, their WGS-like programs stabilized net producer receipts and could have made producer resource adjustment more tenable. Corn and rice price trends over the 1984-1990 period for each policy option imply that output prices and long-run resource allocation would be less affected by WGS-like programs than by present ones. In addition, Government program costs associated with each commodity's WGS-like program could be more predictable than is now possible under present programs. Projected Government costs for the WGS-like programs presented in this report could also be compared with policymakers' projections of Government costs for present programs.

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