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An Analysis of Selected Policy Alternative for 1990 Farm Bill on South Dakota's Agriculture Sector

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AN ANALYSIS OF SELECTED POLICY ALTERNATIVES FOR 1990 FARM BILL ON SOUTH DAKOTA'S AGRICULTURE SECTOR

by

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AN ANALYSIS OF SELECTED POLICY ALTERNATIVES FOR 1990 FARM BILL ON SOUTH DAKOTA'S AGRICULTURE SECTOR

As the congressional debate for the finalization of 1990 Farm Bill nears, the interest in analysis of the new farm bill is increasing. The continued large federal budget deficits, the GATT negotiations, and the increased momentum of conservation and environmental issues are all expected to exert influence in shaping the 1990 farm bill outcome. Practical options for a 1990 farm bill and it's impacts for U.S. agriculture are discussed in Schnittker (1990), Westhoff, et al. (1990a), Westhoff, et al. (1990b) and Meyer (1990). These papers, however, analyze the impacts on a national level. With a recent trend of reducing government payments for farm programs and increased interest in environmental concerns, the predominantly farming states and regions are much more interested in state level analysis of farm bill proposals. As a result of early discussion by policy makers and farm interest groups three alternative policy scenarios for the 1990 farm bill have surfaced. The main objective of this study is to analyze the impacts of these scenarios for a 1990 farm bill on agriculture sector in South Dakota.

Alternative Policy Scenarios

As a result of early discussions among the farm policy makers, farm policy researchers, and the farm interest groups, the three alternative policy scenarios have surfaced. These are; 1) Baseline, 2) Full Flexibility, and 3) Flexibility No Pay. A brief description of these scenarios folows.[1]

Baseline (Continuation of FSA85)

This scenario is basically a continuation of current agricultural policies under the Food Security Act of 1985 (FSA85). Target prices are

frozen at 1990 levels and the loan rates are determined by current formulas. Limited flexibility is provided by the 0-25 program, which allows farmers to plant oilseeds on up to 25 percent of their acreage base without affecting their future payments base. Acreage reduction programs are held at their 1990 levels for feed grains, wheat and cotton and reduced for rice in 1991/92. The conservation reserve is assumed to reach 40 million acres by 1991. The European Community and Japan are assumed to hold commodity price supports at current levels, well above world prices, during the projection period (Meyer, 1990). Hereafter, this scenario is referred to as the Baseline.

Full Flex (An Approximation of Administration's Proposal)

A wide range of options have been proposed which allow varying degrees of planting flexibility. Among these is the Administration's proposal to permit wide flexibility of production with few restrictions. Acorging to this, within a normal crop acreage (NCA) system, producers are allowed to plant any combination of program crops and oilseeds and retain program benefits. Deficiency payments are determined by historical bases (essentially fixed). Acreage Reduction Programs (ARPs) are retained but producers may plant the program crop or approved industrial crops on their acreage conservation reserve (ACR) and forgo deficiency payments on an acre-for-acre basis (Meyer, 1990).

Under this option, producers would compare the market returns to program crop (say corn) with market returns to non-program crops (say soybeans) to determine acreage to plant since corn deficiency payments are made regardless of which crop is planted (up to the limits imposed by ARP). Second, producers need to consider whether (and if so, how much) to plant program crops on ACR by comparing market returns for these acres relative to what is given up in

deficiency payments (Meyer, 1990). Hereafter, this scenario is referred to as Full Flex.

Flex NO Pay (with a $5.50/bu Marketing Loan for Soybeans).

This option offers some of the flexibility of the Full Flex proposal but forces producers to give up deficiency payments if they flex out of the program crop and forbids them from planting on their ACR. Future base, however, is protected. This option reduces government exposure to program costs while retaining the benefits from crop rotation. This option, in a way, extends the current 0-25 program for all crops (Meyer, 1990).

Because of the concern about lost soybean export market share and the general lack of price protection to the soybean (and other oilseed) industry, an option to permit a marketing loan for soybeans has been suggested. Under this proposal, farmers can receive a nine-month loan at a predetermined price level which can be repaid at market prices. The loans must be paid -- they are recourse loans -- with no government stock accumulations. It was assumed that producers would receive a 10 cents premium by redeeming their loans at prices below the season average plus the difference between the loan rate and the farm price (if below the loan rate). Farmers would then market their crop in a normal fashion and receive the farm level prices for their crop. The government cost of the marketing loan option will highly dependent on the loan rate and the season average farm price (Meyer, 1990). Hereafter, this scenario is referred to as the Flex No Pay.

The Estimation Method

The impacts of each scenario were analyzed in two stages. First, the likely impacts of a policy scenario on the U.S. agriculture sector were estimated by

using the agricultural policy model of the Food and Agricultural Policy Research Institute (FAPRI). Second, the impacts of each scenario on South Dakota agriculture sector were estimated by feeding the resulting production and price levels for different crops and livestock for the U.S. into the South Dakota agriculture sector model. It is assumed that the markets in South Dakota are dependent on the U.S. markets, and the levels of production and prices in South Dakota do not have a significant effect on the U.S. markets. Therefore, the issues relating to simultaneity are addressed in the U.S. model.

The U.S. Agricultural Model

The Food and Agricultural Policy Research Institute (FAPRI) model for U.S. agricultural sector is a simultaneous equation econometeric model. The model has equations for behavioral relationships for production, stocks, trade, final consumption and ,where appropriate, intermediate product consumption for major U.S. crop and livestock markets. Linkages among the different commodity and livestock markets are designed to reflect the simultaneous price determination process in U.S. agriculture. For example, livestock prices determine the demand for feed grains, while feed grain prices, in turn, influence investment and production decisions in the livestock sector, and thus affect livestock prices. Details of the FAPRI model are documented in Devadoss, et al. (1989).

The same macroeconomic parameters of the U.S. and the world are used in each scenario. In summary, these include real economic growth averaging 2.6 percent per year in the U.S. and about 3.5 percent per year for the world in aggregate (with variations from the mean between countries and regions), interest rates remaining stable in the 1990s near current levels, inflation

holding below 5 percent per year, the dollar declining slightly in value against most major currencies, the budget deficit declining, and fuel prices increasing at about the rate of inflation (Meyer, 1990).

The assumption of average weather and crop-growing conditions in every year of the projection period is made, implying that crop yields increase according to historic trends. In reality, periods of very favorable or unfavorable weather are quite likely. For example, in U.S., wide-ranging droughts occurred in 1980, 1983, and 1988 (and to a lesser extent 1989) in the past decade alone. With substantially lower stock levels now than during the mid-1980s, markets would likely show sharply wider price variations in response to unfavorable weather conditions (Meyer, 1990).

The South Dakota Agricultural Sector Model

The South Dakota agricultural sector model consists of ten components. Nine of these components represent each of the major South Dakota agricultural commodities and livestock sectors; namely wheat, corn, soybeans, barley, oats, sorghum, cattle, hogs, and dairy. The tenth component consists of the equations for the estimation of farm receipts, expenditures and incomes. Specifically, for wheat, corn, soybean, barley, oats, and sorghum acreage planted, yields and prices in South Dakota depend upon the respective acreage planted, yields and prices at U.S. level. Similarly, production and prices for cattle, hogs, and dairy products in South Dakota depend upon respective production and prices at the U.S. level.

Government payments to South Dakota farmers are estimated using the program rules in effect and prices and production levels in South Dakota. Farm cash receipts in South Dakota, in turn, are estimated using the production and price levels, and the government payments.

Data and Estimation

Data for estimating the agricultural sector model for South Dakota were obtained from yearly Agricultural Statistics reports for the years 1961 through 1987. Since the prices in South Dakota are assumed not to influence price and quantity levels in the U.S. market, the relationship is recursive in nature. Accordingly, the behavioral equations in the South Dakota model were estimated, individually, using the OLS technique except in cases where a serious serial autocorrelation problem was detected. In cases of a serious serial autocorrelation, the equations were estimated using the Cochran-Orcutt technique.

The statistical estimates for the linkage equations for South Dakota agricultural production, prices, farm expenses and farm income are presented in the Appendix I. The statistical results for these equations show that a high percentage of variation is explained by the estimated equations and most of the individual coefficients are significant at the ten percent level.

Projections for South Dakota variables under different scenarios were obtained by combining; a) yearly U.S. solution for that scenario, b) the estimates of coefficients in the South Dakota agricultural sector model, and c) the appropriate government program specifications; through the use of a spreadsheet.

As with any economic projections, results of these projections depend on the underlying assumptions, both those explicitly stated and those implicitly contained in "other things the same" assumption. Nevertheless, these projections are useful in comparing the relative outcome of different policy alternatives and must be viewed in this context.

The duration of FSA85 is five years and it is reasonable to expect the 1990 farm bill to run four to five years also. Thus the crop years 1991/92

through 1995/96 are included in the analysis of the baseline and the alternative policy proposals. For discussion, the results of the analysis are presented as annual averages for five crop year periods (1986/87-1990/91, and 1991/92-1995/96). The detailed yearly projections under Baseline, Ful Flex, and Flex NO Pay scenarios are reported in Appendix II, Appendix III, and Appendix IV respectively.

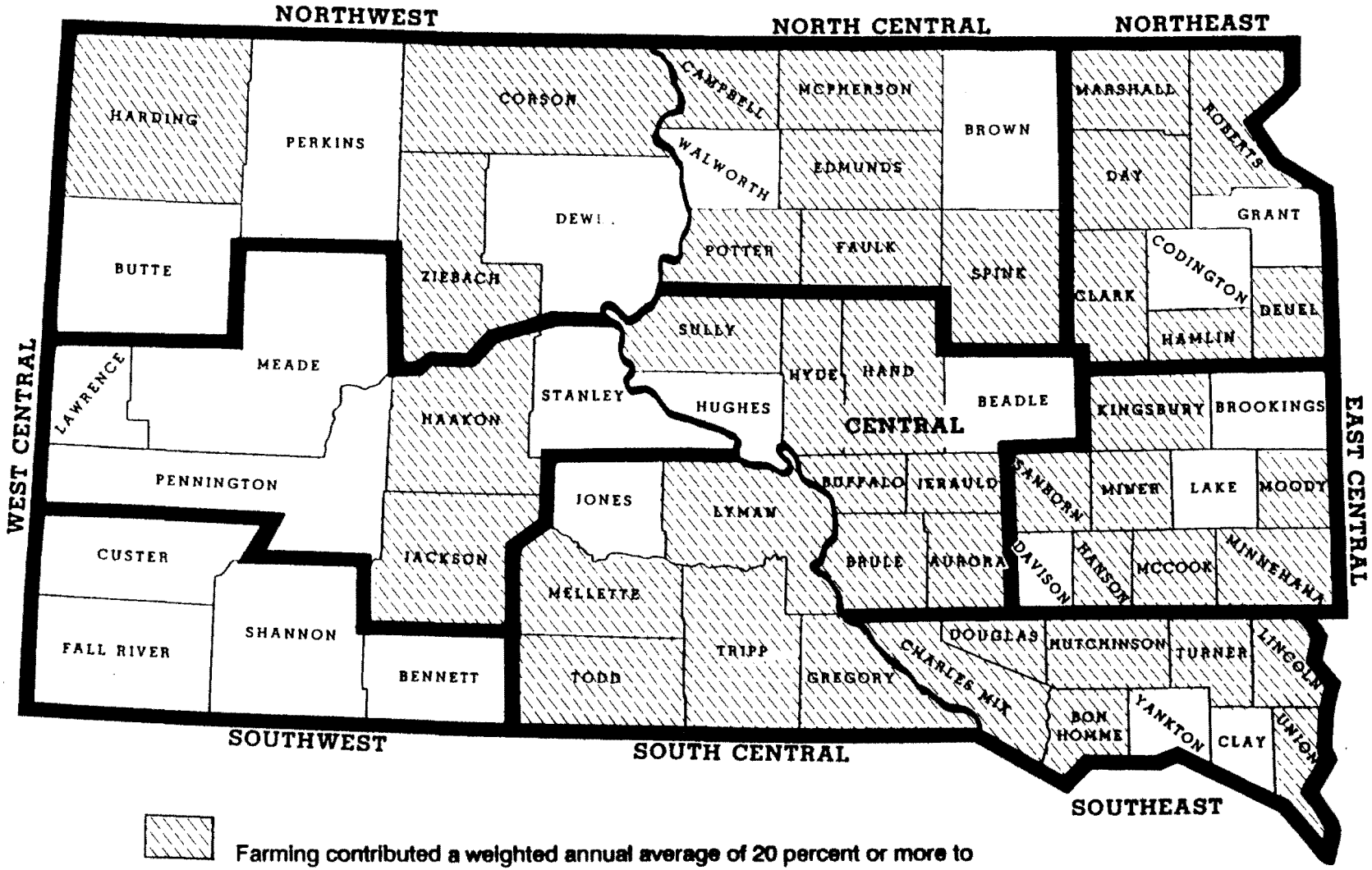
Agriculture Sector in South Dakota

South Dakota is primarily a farming-dependent state. Only the counties with urban areas and/or university towns (Brown, Brookings, Minnehaha, Clay, Hughes and the eastern part of the Pennington county) and the Black Hills area (Lawrence, Custer, Fall River and the western parts of Meads and Pennington counties) are not farming-dependent.

To devise a single statistic to identify the farming-dependent areas in any State is difficult and not without limitations. A widely used criterion is that 20 percent or more of the total county income is derived from farm labor and proprietor income during a five year period. Farming dependent counties in South Dakota, using this criterion, are shown in Figure 1.

The predominant use of land in South Dakota is permanent pasture and rangeland, which accounts for 52 percent of the South Dakota's acreage. About 45 percent of the land in the state is cropland. Major crops grown in South Dakota include hay, wheat, corn, soybeans, oats, barley, and sorghum. During 1986-88, on average, hay accounted for 4.25 million acres. During the same period, program crops accounted for 45 percent of the total area harvested in the state. For this period, the area harvested for wheat, corn, oats, barley, and sorghum averaged 3.35, 2.67, 1.00, 0.72, and 0.27 million acres, respectively. The area harvested for soybeans averaged 1.48 million acres.

FIG. 1. Farming-Dependent Counties In South Dakota



Farming contributed a weighted annual average of 20 percent or more to total labor and proprietor income over the five-year period from 1975 to 1979

Source: Bender, L.D. et. al., The Diverse Social and Economic Structure of Non-Metropolitan America, ERS, USDA

During 1986-88, annual production of cattle, hogs, and milk in South Dakota averaged 1670, 694, and 1717 million pounds, respectively. Other livestock products produced in South Dakota are sheep and lamb, wool, honey, turkey, and eggs. During 1986-88, annual production of sheep and lamb, wool, honey, and turkey averaged 52, 5, 25, and 62 million pounds, respectively. The annual egg production during the years averaged 30 million dozens.

Cattle and hog production are the most important sources of cash receipts by farmers in South Dakota. During the years 1986-88, the production of cattle and hogs, respectively, accounted for 37.2 percent and 10.4 percent of the total cash receipts to the farmers in the state (Table 1). During the same period, the production and sale of wheat, corn, and soybeans, respectively, contributed 7.1, 7.5, and 7.0 percent of the cash receipts to the state's farmers (Table 1).

Government programs play an important part in determining the profitability of the state's agriculture. During 1986-88, government payments under various agricultural programs in South Dakota averaged $461 million per year -- 14.2 percent of total gross farm income (Table 2). About half of these payments were made under feedgrain programs. The wheat program accounted for another one fourth of these payments (Table 2). Payments under agricultural and conservation programs averaged about 6 percent of all government payments to South Dakota farmers during the period. In recent years, however, the relative proportion of conservation payments has been higher.

Base acres and base intensities for different program crops established in different counties of South Dakota are shown in Figures 2 and 3. Corn base acres are mainly located in the central and eastern parts of the state with heavy concentration in the eastcentral and southeast regions of the state.

Table 1. Cash receipts from farm marketings and government payments, South Dakota, 1986-88.

	1986	1987	1988	1986-88 AVG.	
	..... (million dollars)				(percent)
Wheat	226.43	249.20	192.26	222.63	7.11%
Corn	266.60	177.23	259.57	234.47	7.49%
Soybeans	181.56	191.60	288.36	220.51	7.04%
Barley	32.91	32.39	37.37	34.22	1.09%
Oats	23.55	42.89	41.13	35.86	1.14%
Sorghum	17.31	10.86	12.34	13.50	0.43%
Other Crops	140.65	115.56	114.47	123.56	3.94%
Cattle & Calves	878.71	1251.18	1361.43	1163.77	37.16%
Hogs	317.48	350.69	310.58	326.25	10.42%
Dairy	197.90	198.90	199.53	198.78	6.35%
Other Livestock Prods.	92.46	105.92	93.65	97.34	3.11%
Government Payments	382.85	504.83	496.05	461.24	14.73%
Total Cash Receipts	2758.41	3231.25	3406.74	3132.13	100.00%

Source: South Dakota Agriculture Statistics, 1984-1990.

Table 2. Government payments in South Dakota, 1986-88.

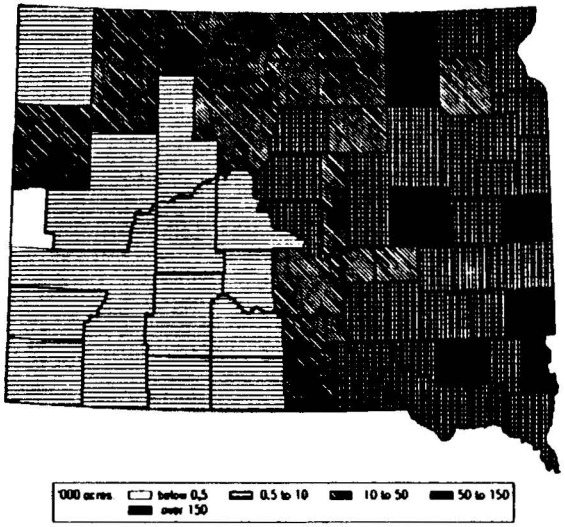
Item	1986	1987	1988	1986-88 AVG.
Direct Govt. Payments:	..... (million dollars)			(percent)
Feed Grain Programs	178.7	289.2	232.7	233.5	50.63%
Wheat Program	157.3	127.1	74.9	119.8	25.97%
Conservation a/	4.2	31.8	46.6	27.5	5.97%
Wool Act	6.7	5.7	4.6	5.7	1.23%
Misc. Payments b/	36.0	51.0	137.2	74.7	16.20%
Total Direct Govt. Payments	382.9	504.8	496.0	461.2	100.00%
(as % of Farm Income) c/	(12.60%)	(14.89%)	(14.99%)	(14.21%)	---

a/ Includes ammounts paid under Agricultural and Conservation Programs.
b/ Includes Milk Indemnity Program, Payment-in-Kind Program, Beekeeper Indemnity, Emergency Feed Program, Water Bank Program, and Other Miscellaneous Programs including Drought Payments.
c/ Total Direct Govt. Payments as a percent of Total Gross Farm Income.

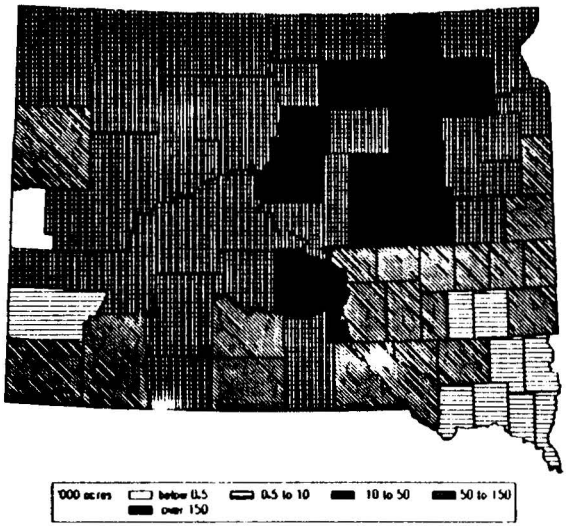
Source: South Dakota Agricultural statistics, 1984-90.

FIG. 2. Program Crop Bases Established In South Dakota

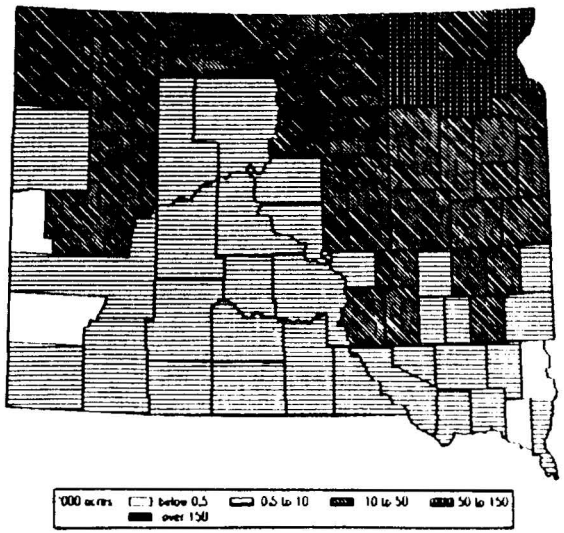
Corn Base Established in Counties of SouthDakota
(thousand acres)



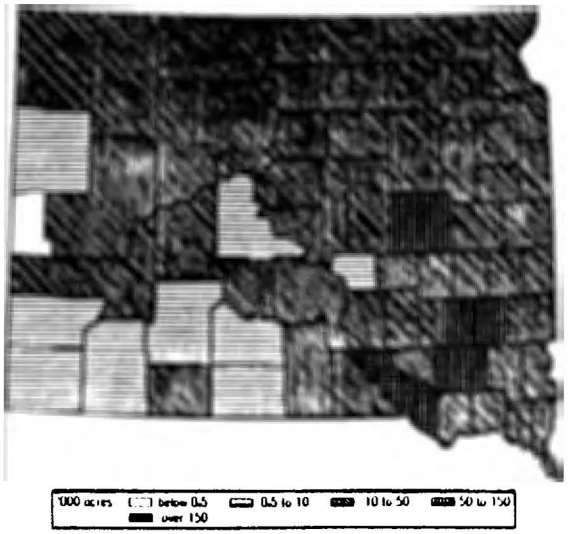
Wheat Base Established in Counties of SouthDakota
(thousand acres)



Barley Base Established in Counties of SouthDakota
(thousand acres)



Oats Base Established in Counties of SouthDakota
(thousand acres)



Sorghum Base Established in Counties of SouthDakota
(thousand acres)

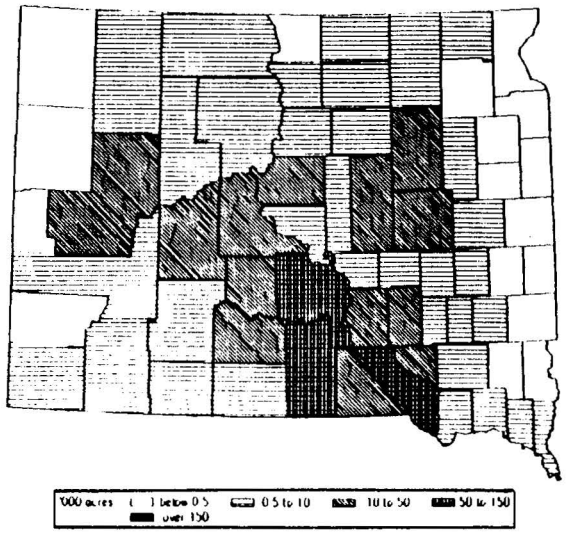
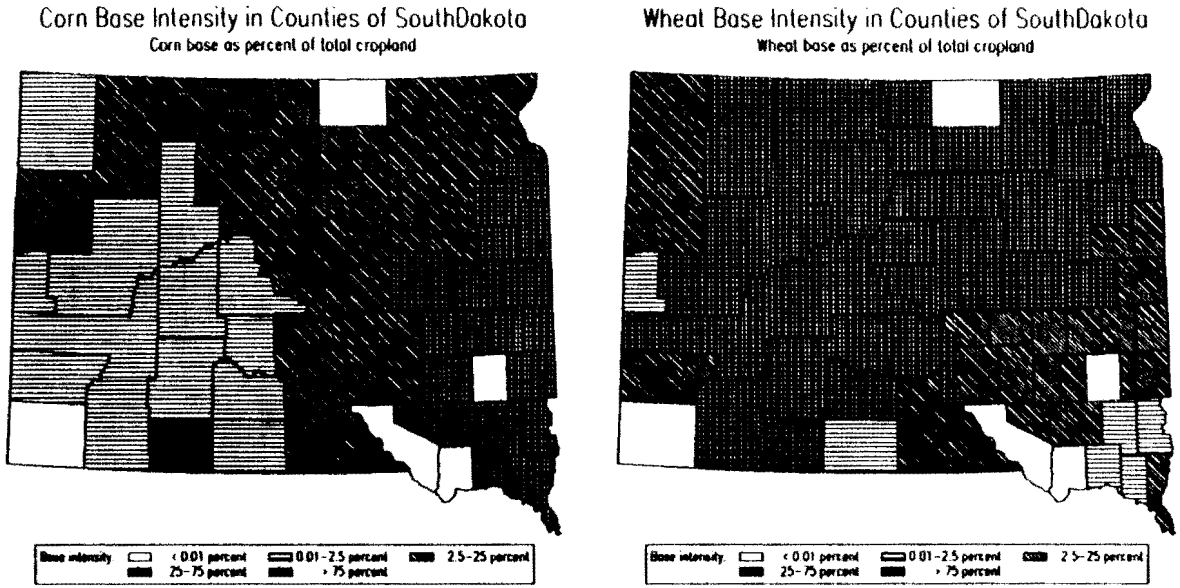
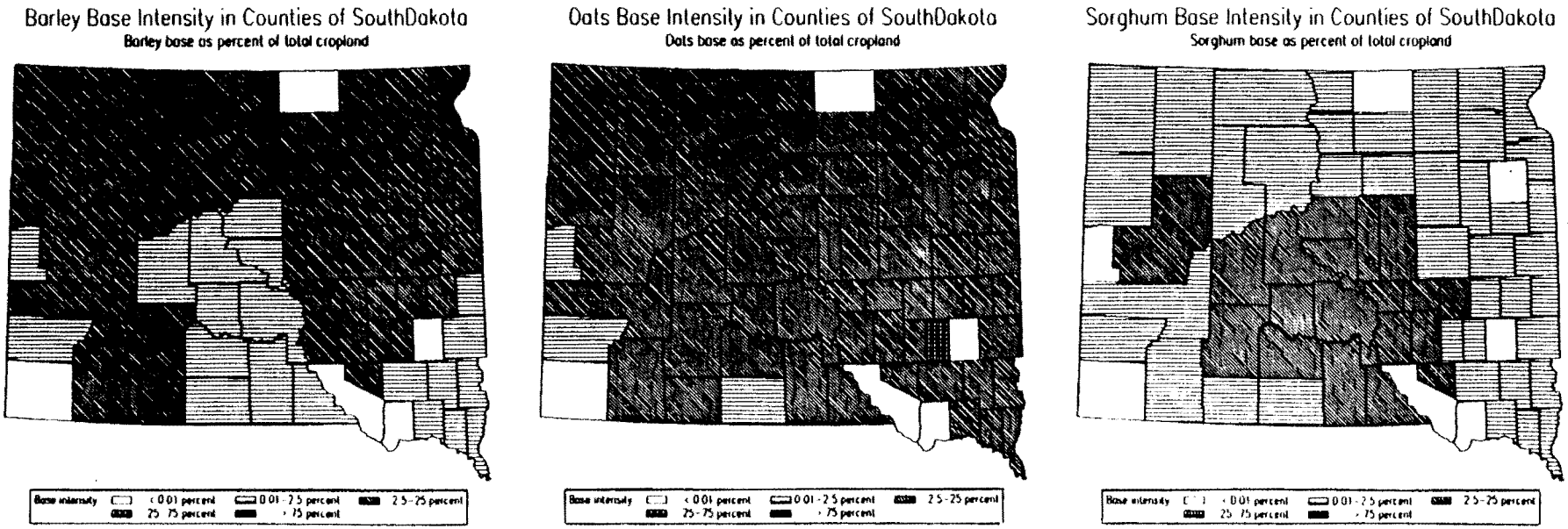


FIG. 3. Program Crop Bases Intensities In South Dakota





Corn base intensity is higher in the eastern counties of the state, and is highest in the southeastern part of the state (Moody, Lake, Minnehaha, Lincoln, and Union Counties). Most of the wheat base is located in the northern half of the state, and it's intensity is highest in the central part of the state (Sully, Stanley, and Hughes counties). Barley, oats, and sorghum bases have been established throughout the state at varying intensities.

Conservation Reserve Program (CRP) enrollment has been state wide, with higher concentrations in the northwestern parts of the state, which are prone to wind erosion (Figure 4). The CRP enrollment intensity is highest in the eastern half of the northwestern part of the state (Ziebach, Carson, and Dewey counties). County average CRP rents for most of the state are in the range of $30 to $45 per acre, with some land in the eastern parts of the state attracting higher rents (Figure 4). The CRP acres in South Dakota are predominantly those that are prone to wind erosion. There is still some potential for additional enrollment if the CRP enrollment for this category is again opened.

Baseline Projections

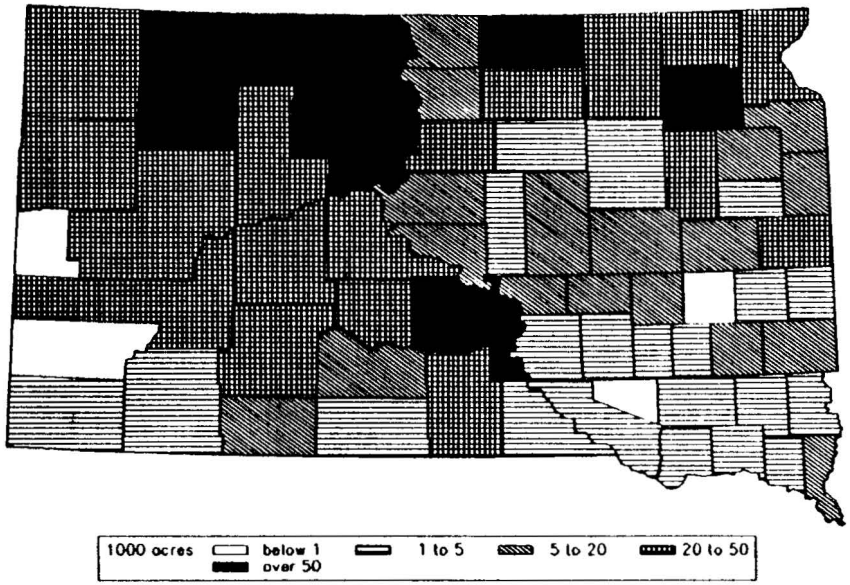
For the baseline projections, average values for the key variables for the next five years are compared with the respective average values during the preceding five years.

Crop Production and Prices

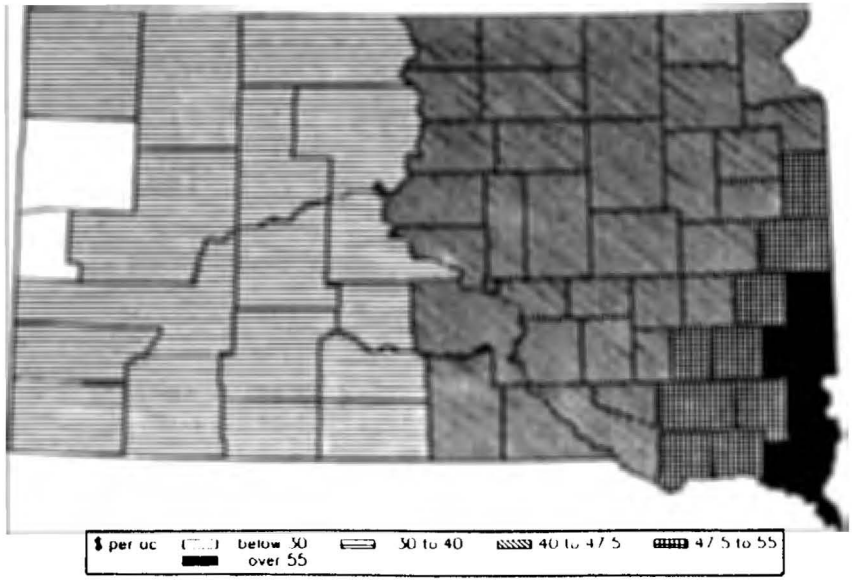
Under the Baseline scenario, it is projected that there will be a moderate increase in both wheat and corn acreage during the next five years (Table 3). The average yearly production of wheat and corn are projected to increase by about 19 and 18 million bushels, respectively. The area under

FIG. 4. CRP Acres Enrolled In South Dakota

CRP Acres Enrolled in Counties of SouthDakota
(thousand acres)



County Average CRP Rental Rates in Counties of SouthDakota
(dollars per acre)



Intensity of CRP Enrollment in Counties of SouthDakota
(enrollment as percent of total cropland)

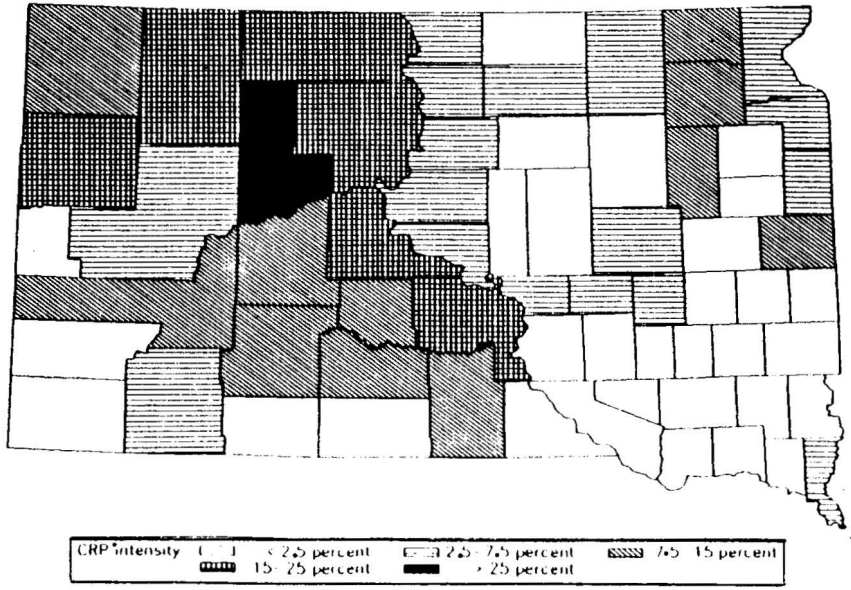


Table 3. Major crop area, production and prices, South Dakota, Baseline, 1986-1995.

Variable	86/87-90/91 Average (Actual) a/	91/92-95/96 Average (Projections)	Change	Percent Change
ACRES PLANTED:	..... (million acres)			
Wheat	3.99	4.31	0.32	8.02%
Corn	3.29	3.43	0.15	4.41%
Soybeans	1.40	1.39	-0.01	-0.54%
Barley	0.85	0.81	-0.04	-4.78%
Oats	1.39	1.28	-0.10	-7.51%
Sorghum	0.38	0.37	-0.01	-2.55%
PRODUCTION:	..... (million bushels)			
Wheat	102.00	121.17	19.17	18.79%
Corn	196.74	215.25	18.51	9.41%
Soybeans	42.14	49.89	7.75	18.40%
Barley	30.58	34.06	3.48	11.37%
Oats	44.74	51.79 b/	7.05 b/	15.75% b/
Sorghum	12.57	12.78	0.20	1.61%
CROP PRICES:	..... (dollars per bushel)			
Wheat	3.12	3.31	0.19	6.09%
Corn	1.91	1.97	0.06	3.14%
Soybeans	5.41	5.65	0.24	4.44%
Barley	1.88	1.86	-0.02	-1.06%
Oats	1.71	1.64	-0.07	-4.09%
Sorghum	1.60	1.72	0.12	7.50%

a/ Includes preliminary estimates for 1989/90 and projections for 1990/91.
b/ The oats production projections for 91/92-95/96 is overly optimistic. The oats yield equation for South Dakota seems to be the culprit, which is predicting a 31% increase in the yield during the period. If the oats' yield in South Dakota increases by 19% (as in the case of U.S.), the average annual S.D. oats production for 91/92-95/96 will be about 47.17 million bushels (an increase of 2.43 million bu. or 5.43%).

soybean is projected to be slightly lower. The annual production of soybeans is, however, expected to be higher by about 8 million bushels. The area under barley and sorghum is projected to decrease moderately during this period. The annual production of barley is expected to increase by about 3 million bushels while the annual production of sorghum is expected to increase marginally. The area under oats is expected to show a large decrease. Due to some increase in the yield, the production of oats will, probably, increase by 2 to 3 million bushels. The prices received by the South Dakota farmers are projected to show a marginal improvement for wheat, corn, soybeans and sorghum. The prices for barley and oats are expected to be slightly lower.

Livestock Production and Prices

The production of both beef and pork are projected to moderately increase during next five years (Table 4). It seems that the demand for beef will be strong, resulting in a moderate increase in beef prices. The demand for pork, on the other hand, will be relatively weak. As a result, the pork prices are expected to decrease moderately during the next five years. During the next five years, milk production is projected to increase by 4 percent. During this period, average milk prices received by South Dakota farmers are expected to decrease by as much as 12 percent.

Government Payments

The annual deficiency payments are projected to be $87 million lower during the next five years even when the current policies are continued (Table 5). The deficiency payments for wheat are projected to be lower by $51 million per year. Similarly, the deficiency payments for corn are expected to be lower by $26 million per year (Table 5). This decrease in the deficiency

Table 4. Production of major livestock products and their prices, South Dakota, Baseline, 1986-1995.

Variable	86/87-90/91 Average (Actual) a/	91/92-95/96 Average (Projections)	Change	Percent Change
LIVESTOCK PRODUCTION:	..... (million pounds)			
Cattle & Calves	1676.01	1739.47	63.46	3.79%
Hogs	657.21	669.22	12.00	1.83%
Milk	1780.13	1852.97	72.84	4.09%
LIVESTOCK PRICES:	..... (dollars/100 pounds)			
Cattle & Calves	65.85	68.08	2.23	3.39%
Hogs	47.39	44.73	-2.66	-5.61%
Milk	11.80	10.38	-1.42	-12.03%

a/ Includes preliminary estimates for 1989/90 and projections for 1990/91.

Table 5. Government payments in South Dakota, Baseline, 1986-1995.

Variable	86/87-90/91 Average (Actual) a/	91/92-95/96 Average (Projections)	Change	Percent Change
Deficiency Payments for:	.... (million dollars)			
Corn.	165.78	139.91	-25.87	-15.61%
Wheat.	110.95	59.77	-51.18	-46.13%
Barley.	8.00	4.31	-3.69	-46.13%
Oats.	2.08	0.00	-2.08	-100.00%
Sorghum.	11.53	7.08	-4.45	-38.59%
Total Def. Payments in S.D.	298.34	211.07	-87.27	-29.25%
Cons. Reserve Payments in S.D.	37.15	48.86	11.71	31.52%
Total Direct Payments in S.D. b/	335.49	259.93	-75.56	-22.52%
Total Direct Payments in U.S. b/	14805.20	11886.00	-2919.20	-19.72%

a/ Includes preliminary estimates for 1989/90 and projections for 1990/91.
b/ Total direct government payments to farmers excluding drought payments.

payments for wheat and corn is a result of two factors. First, the participation in these commodity programs is projected to be lower during the next five years compared to the preceding five years. Therefore, fewer bushels are expected to be eligible for deficiency payment.[2] Second, due to higher market prices the deficiency payments per bushel are projected to be lower.[3]

The annual conservation payments, however, are expected to increase by about $12 million. On the whole, the average annual direct government payments to South Dakota farmers during the next five years are projected to be $76 million lower compared to the preceding five years (Table 5). This amounts to a 23 percent decrease in direct government payments in South Dakota compared to only 20 percent decrease in direct government payments in the U.S.

Farm Income

Under the Baseline scenario, the major crops produced in South Dakota are expected to bring an additional $230 million dollars per year from the market place during next five years compared to the preceding five years (Table 6). Similarly, it is projected that the annual value of major livestock products produced in South Dakota, during the next five years, will be higher by $46 million dollars. The average annual gross returns to South Dakota farmers during the next five years are projected to be about $223 million higher (Table 6). The yearly value of projected livestock production and crop production, along with the yearly gross receipts to South Dakota farmers for the crop years 1985/86 through 1996/97 are shown in figure 5.

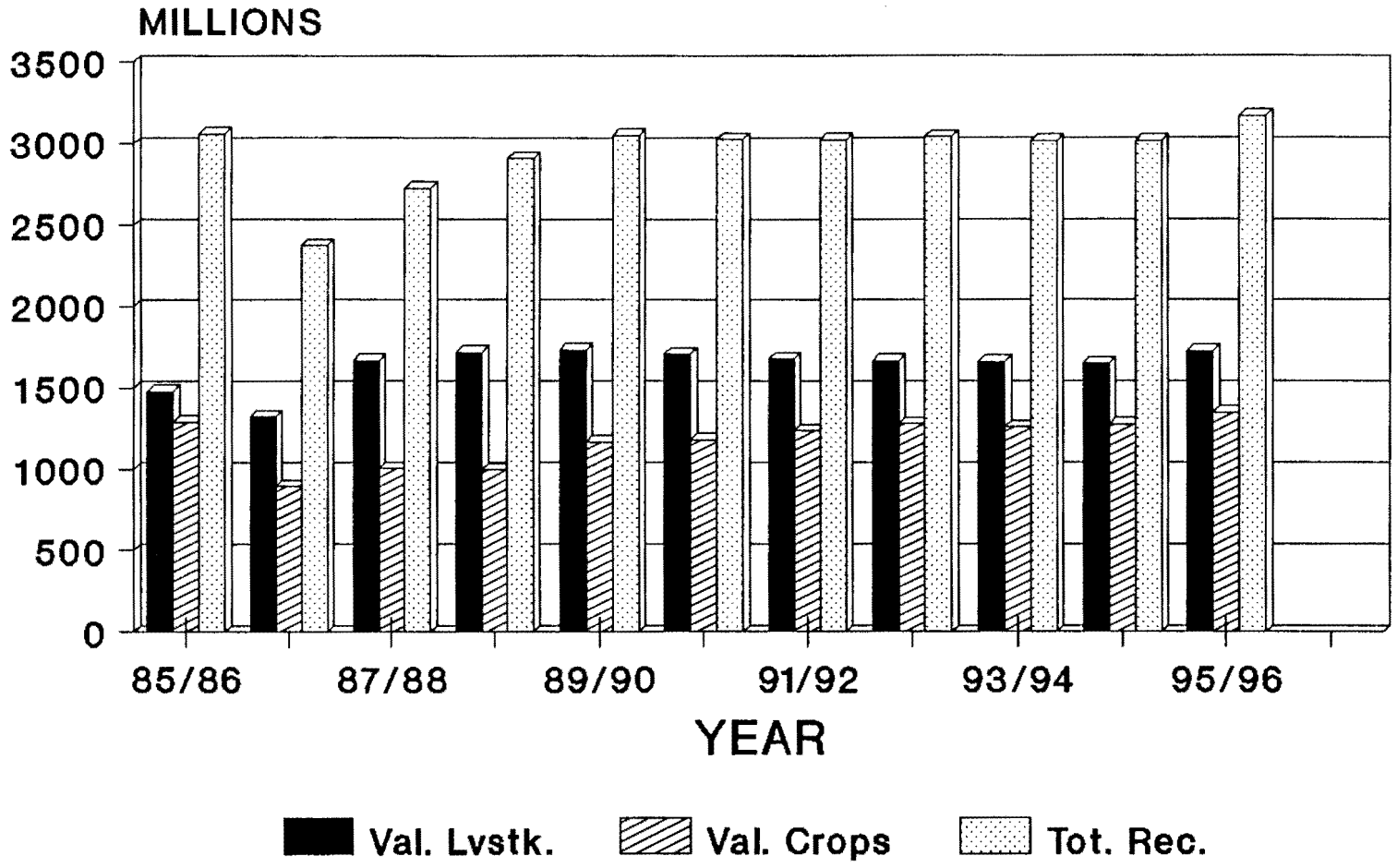
In spite of increased farm receipts from the market place, the average annual net farm income is projected to be about 9 percent lower during the next five years, compared to preceding five years (Table 6). This is partly

Table 6. Farm receipts and income, South Dakota, Baseline, 1986-1995.

Variable	86/87-90/91 Average (Actual) a/	91/92-95/96 Average (Predicted)	Change	Percent Change
FARM RECEIPTS & INCOME:	..... (million dollars)			
Value of Lvstk. Prod. b/	1629.91	1675.40	45.50	2.79%
Value of Crop Prod. c/	1047.47	1277.77	230.30	21.99%
Total Cash Receipts. d/	2818.44	3053.77	235.32	8.35%
Government Payments. e/	335.49	259.93	-75.56	-22.52%
Total Gross Returns.	3536.27	3759.62	223.35	6.32%
Total Prod. Expenses.	2472.39	2803.51	331.12	13.39%
Net Farm Income. (before Inv. Adj.)	1045.04	956.11	-88.93	-8.51%

a/ Includes preliminary estimates for 1989/90 and projections for 1990/91.
b/ Value of cattle & calves, hogs, and milk production.
c/ Value of wheat, corn, soybeans, barley, oats, and sorghum production.
d/ Includes the cash receipts from other miscelaneous livestock products and crops.
e/ Direct government payments to S.D. farmers excluding drought payments.

FIG. 5. Gross Farm Receipts In South Dakota



due to lower government payments and partly due to higher production expenses. During the next five years, the annual government payments are projected to be lower by about $76 million and the annual farm production expenses are expected to be higher by $331 million compared to the preceding five years. The average annual net farm income in South Dakota is expected to be $89 million lower for the next five years compared to the preceding five years (Table 6).

Projections Under Full Flex And Flex No Pay

Projections under both of these scenarios are qualitatively very similar to the baseline projections. For these two scenarios, the average annual projections for the next five years for the key variables are compared to the baseline projections. The comparison of five year average estimates shows that, for most variables, there are only marginal differences between the projections for these two scenarios and for the Baseline.

Crop Production and Prices

Under the Full Flex scenario, it is estimated that there will be moderate increases in soybean and wheat areas and a moderate decrease in corn, compared to the baseline projections (Table 7). As a result, there will be an additional production of 2 million bushels of wheat and 3 million bushels of soybeans per year. The annual corn production is expected to be lower by 3 million bushels compared to the baseline projections (Table 7).

During the next five years, under the Full Flex scenario, corn prices are expected to be higher by 12 cents per bushel compared to the baseline projections. The wheat and soybeans prices are, however, expected to be lower by 10 cents and 68 cents per bushel, respectively, under the Full Flex

Table 7. Major crop area, production and prices under alternative policy scenarios, South Dakota, projections for 1991/92-1995/96 averages.

Variable	Baseline	Change from Baseline Under Full Flex		Change from Baseline Under FNP + 5.50 ML	
ACRES PLANTED:	(million acres)	(million acres)	(percent)	(million acres)	(percent)
Wheat	4.31	0.07	1.71%	0.01	0.14%
Corn	3.43	-0.07	-1.97%	-0.02	-0.47%
Soybeans	1.39	0.07	5.04%	0.01	0.50%
Barley	0.81	-0.01	-1.24%	-0.00	-0.50%
Oats	1.28	0.01	0.46%	0.00	0.00%
Sorghum	0.37	-0.00	-0.87%	-0.00	-0.76%
PRODUCTION:	(million bu.)	(million bu.)	(percent)	(million bu.)	(percent)
Wheat	121.17	1.90	1.57%	0.14	0.11%
Corn	215.25	-3.15	-1.46%	-0.74	-0.34%
Soybeans	49.89	3.04	6.10%	0.23	0.46%
Barley	34.06	-0.43	-1.27%	-0.20	-0.58%
Oats	51.79	0.39	0.74%	0.01	0.01%
Sorghum	12.78	-0.10	-0.78%	-0.10	-0.78%
CROP PRICES:	($ per bu.)	($ per bu.)	(percent)	($ per bu.)	(percent)
Wheat	3.31	-0.10	-3.02%	-0.01	-0.30%
Corn	1.97	0.12	6.09%	0.03	1.52%
Soybeans	5.65	-0.68	-12.04%	-0.17	-3.01%
Barley	1.86	0.08	4.30%	0.03	1.61%
Oats	1.64	0.02	1.22%	0.02	1.22%
Sorghum	1.72	0.06	3.49%	0.03	1.74%

scenario when compared to the baseline projections. Under the Baseline scenario (which is based on the provisions of the Food Security Act of 1985), farmers may continue to plant some corn in order to maintain their corn base. If the farmers are permitted to plant any program crop or oilseed within their normal crop acreage (as assumed under the Full Flex scenario), they will decrease the corn area. The projected annual decrease of about 70,000 acres in the corn area under Full Flex is due to the combined effect of increased flexibility and the changes in the relative prices for different crops. Under the Full Flex scenario, the area under oats is expected to be slightly higher and the areas under barley and sorghum are expected to be slightly lower when compared to the baseline projections.

The changes in crop production and crop prices under the Flex No Pay (with a $5.50 marketing loan) scenario are marginal when compared to the baseline projections. The direction of these changes are similar to those in case of Full Flex scenario (Table 7).

Livestock Production and Prices

Adding flexibility to crop production seems to have very little impact on the livestock production. Projections for cattle, hogs, and milk production, as well as their prices, are about the same for both the Full Flex and the Flex No Pay scenarios (Table 8). Under both of these scenarios, the average cattle production and prices are projected to be marginally higher when compared to the baseline projections. Under both of these scenarios, hog production is expected to be slightly lower and hog prices are expected to be slightly higher when compared to the baseline projections (Table 8). These differences are, however, small. Milk production and prices, under both of these scenarios, are projected to be the same as under the baseline.

Table 8. Production of Livestock products and their farm prices under alternative policy scenarios, South Dakota, projections for 1991/92-1995/96 averages.

Variable	Baseline	Change from Baseline Under Full Flex		Change from Baseline Under FNP + 5.50 ML	
PRODUCTION:	(million lbs.)	(million lbs.)	(percent)	(million lbs.)	(percent)
Cattle & Calves	1739.47	3.38	0.19%	3.38	0.19%
Hogs	669.22	-5.87	-0.88%	-5.87	-0.88%
Milk	1852.97	0.00	0.00%	0.00	0.00%
PRICES:	($/100 lb.)	($/100 lb.)	(percent)	($/100 lb.)	(percent)
Cattle & Calves	68.08	1.25	1.84%	1.25	1.84%
Hogs	44.73	1.81	4.05%	1.81	4.05%
Milk	10.38	0.00	0.00%	0.00	0.00%

Government Payments

The projected yearly government payments in South Dakota under alternative scenarios along with actual historical data for previous years are plotted in Figure 6. Direct federal government payments were exceptionally high for years 1986/87 and 1987/88 due to low grain prices in these years, and for year 1988/89 due to large drought payments. Even under the Baseline, the direct government payments to South Dakota farmers are expected to be about $76 million a year lower during next five years, compared to preceding five years (Table 6).

Under both Full Flex and Flex No Pay scenarios, the direct government payments to South Dakota farmers are projected to be even lower. The annual corn deficiency payments in South Dakota are expected to be $25 million less under the Full Flex scenario and $7 million less under the Flex No Pay scenario when compared to the baseline estimates. These decreases in deficiency payments for corn are due to higher corn prices and thereby lower deficiency payments per bushel under these scenarios compared to the Baseline.

Average annual deficiency payments for wheat, however, are projected to be $9 million more under the Full Flex scenario and $1 million more under Flex No Pay scenario as compared to the baseline projections. These increases in the deficiency payments for wheat are due to the projected drop in price and thereby an increase in deficiency payment per bushel under this scenario, compared to the Baseline.

On the whole, South Dakota is expected to lose an additional $18 million per year in deficiency payments under the Full Flex scenario when compared to the baseline estimates. Similarly, South Dakota is expected to lose an additional $7 million per year in deficiency payments under the Flex No Pay scenario when compared to the baseline projections (Table 9). It should be

FIG. 6. Government Payments In South Dakota

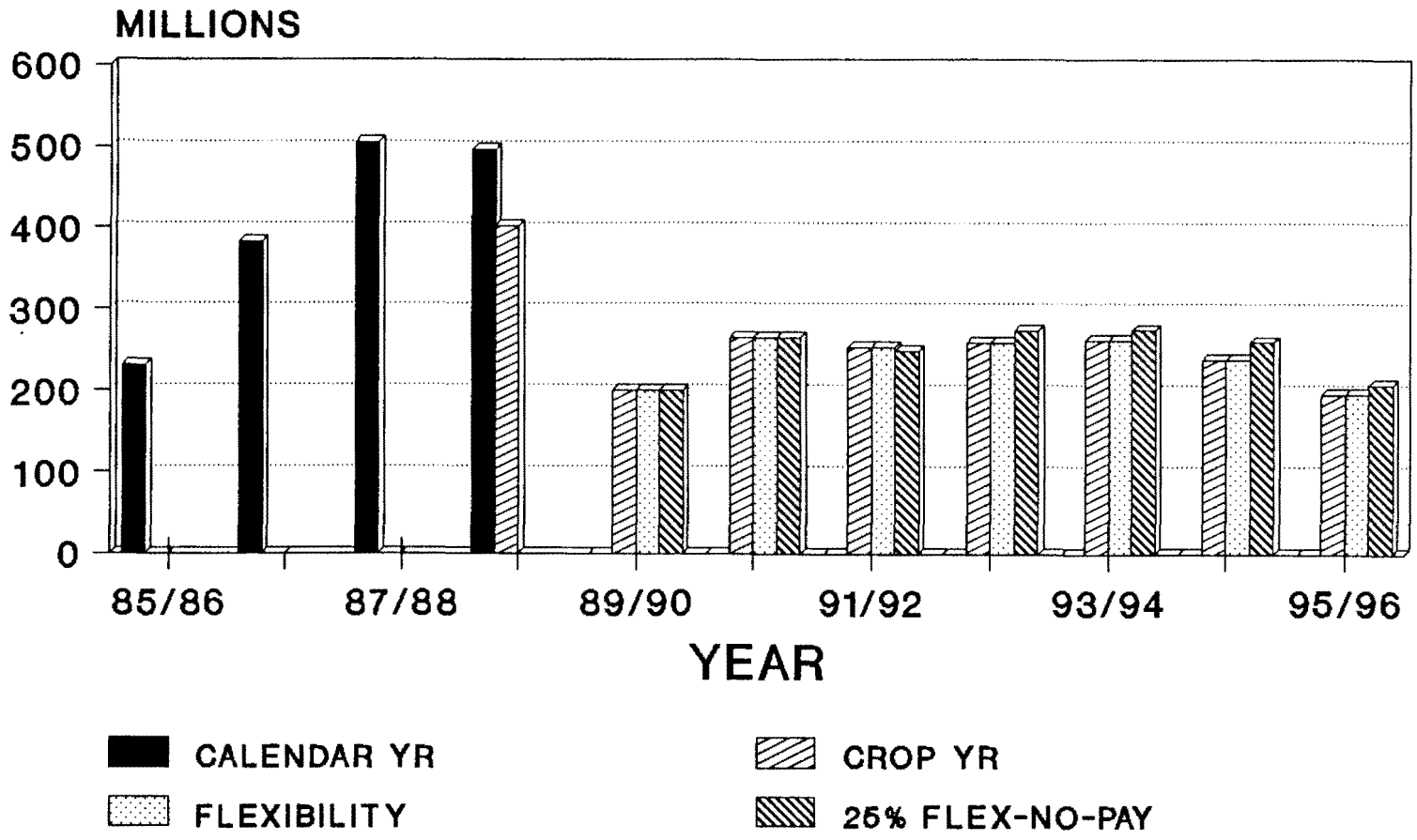


Table 9. Comparison of alternative policy scenarios on direct government payments to farmers in South Dakota, projections for 1991/92-1995/96 averages.

Variable	Baseline	Change from Baseline Under Full Flex		Change from Baseline Under FNP + 5.50 ML	
	(million $)	(million $)	(%)	(million $)	(%)
Deficiency Payments for:					
Corn.	139.91	-25.08	-17.93%	-7.01	-5.01%
Wheat.	59.77	9.04	15.13%	0.78	1.30%
Barley.	4.31	-1.16	-26.94%	-0.38	-8.72%
Oats.	0.00	0.00	---	0.00	---
Sorghum.	7.08	-0.72	-10.17%	-0.32	-4.56%
Total Def. Payments in S.D.	211.07	-17.92	-8.49%	-6.93	-3.28%
Cons. Reserve Payments in S.D.	48.86	0.00	0.00%	0.00	0.00%
Total Direct Payments in S.D.	259.93	-17.93	-6.90%	-6.94	-2.67%
Total Direct Payments in U.S.	11886.00	0.00	0.00%	0.00	0.00%

noted that these reductions are in addition to the projected loss of $75 million per year in deficiency payments under the Baseline scenario compared to 1986/90. It may also be noted that while the predictions for South Dakota indicate a lose of deficiency payments under both Full Flex and Flex No Pay scenarios, the direct government payments in the U.S., on the whole, are not expected to decrease under these scenarios when compared to the Baseline.

Farm Income

A summary of projected farm receipts, production expenses and income under the Full Flex and the Flex No Pay scenarios compared to the Baseline is presented in Table 10. On average, annual cash receipts from crops and annual government payments are projected to be higher under the Baseline compared to both the Full Flex and the Flex No Pay scenarios. The projected average annual cash receipts from the livestock sector are higher for both the Full Flex and Flex No Pay scenario. The projected average annual farm production expenses are same under all three scenarios. On average, the annual farm income under the Full Flex scenario during the next five years is projected to be about $24 million higher than the baseline projections.

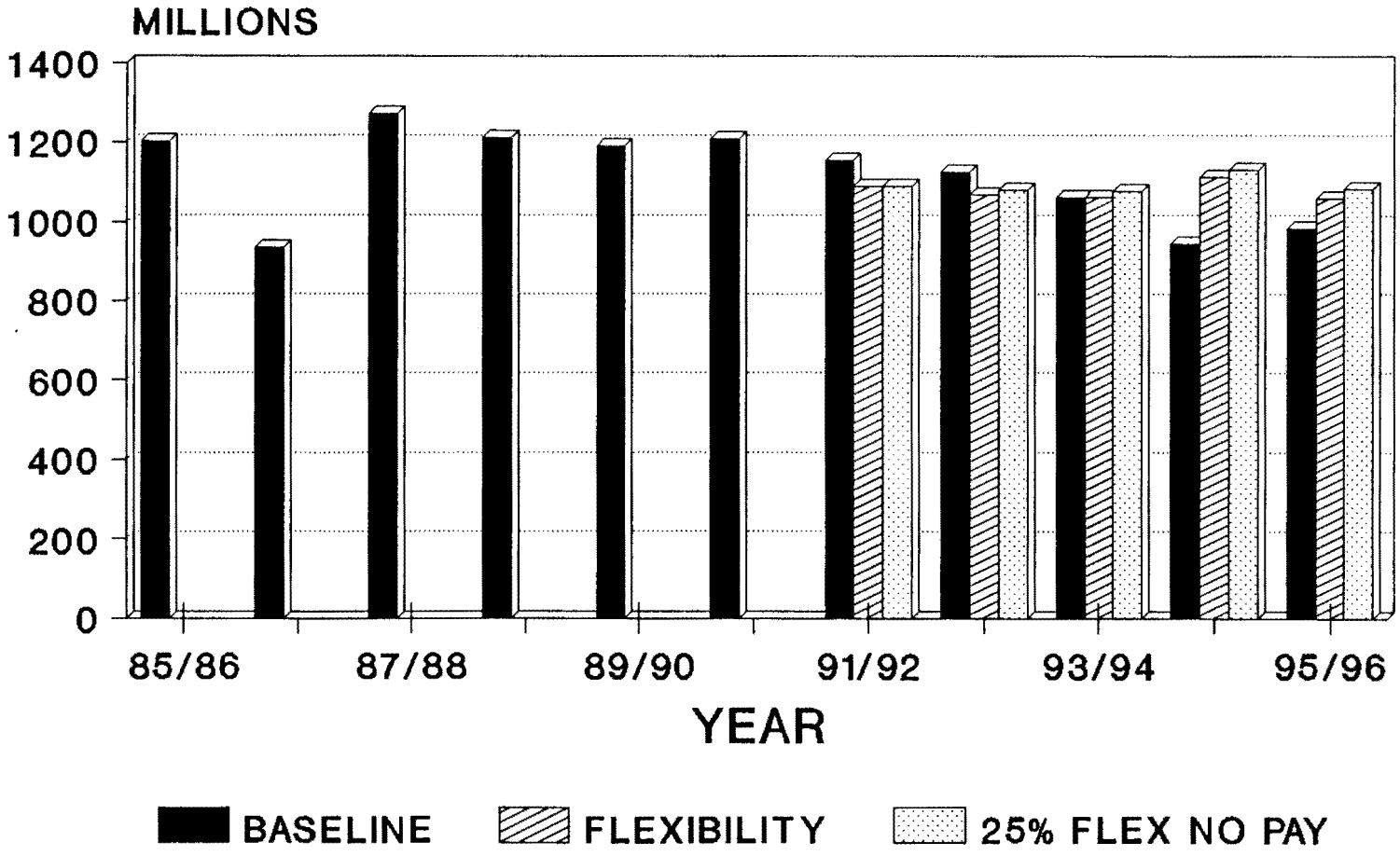
Similarly, the average annual farm income under the Flex No Pay scenario is projected to be about $37 million higher than the baseline projections. The yearly projections show that, under all three scenarios, the net cash income to South Dakota farmers is expected to be lower during the next five years compared to the preceding five years (Figure 7). During the earlier years (1991/92 and 1992/93), the farm income is expected to be relatively higher under the Baseline. During the distant years (1994/95, and 1995/96), the farm income is expected to be higher under the Full Flex and the Flex No Pay scenarios (Figures 7).

Table 10. Farm receipts and income under alternative policy scenarios, South Dakota, projections for 1991/92-1995/96 averages.

Variable		Baseline	Change from Baseline Under Full Flex		Change from Baseline Under FNP + 5.50 ML	
FARM RECEIPTS & INCOME:		($1,000,000)	($1,000,000)	(Percent)	($1,000,000)	(Percent)
Value of Lvstk. Prod.	a/	1675.40	32.86	1.96%	32.86	1.96%
Value of Crop Prod.	b/	1277.77	-4.12	-0.32%	-0.67	-0.05%
Total Cash Receipts.	c/	3053.77	41.94	1.37%	44.41	1.45%
Government Payments.	d/	259.93	-17.92	-6.90%	-6.93	-2.67%
Total Gross Returns.		3759.62	24.02	0.64%	37.48	1.00%
Total Prod. Expenses.		2803.51	0.00	0.00%	0.00	0.00%
Net Farm Income. (before Inv. Adj.)		956.11	24.02	2.51%	37.48	3.92%

a/ Value of cattle & calves, hogs, and milk production.
b/ Value of wheat, corn, soybeans, barley, oats, and sorghum production.
c/ Includes the cash receipts from other miscelaneous livestock products and crops.
d/ Direct government payments to farmers.

FIG. 7. Net Cash Income In South Dakota



Implications for South Dakota

The impacts of all three policy scenarios on South Dakota's farm sector are more or less similar. Generally, the South Dakota farmers will be bringing in larger receipts from the market place. However, in spite of higher receipts from the market place, farmers' net income is expected to be lower during the next five years compared to the preceding five years. This is because under all three scenarios, farm production expenses are expected to increase and the government deficiency payments are expected to decrease. As a result, the net farm income during the next five years is expected to be lower compared to the preceding five years.

The projected impacts of continuing the present policies (the Baseline scenario), for next five years, are substantial. Even though the average annual market values of major crops and livestock production are expected to increase by $275 million, the average annual net farm income is expected to decrease by $89 million. An increase of $331 million in annual farm production expenses and a loss of about $76 million in annual government direct payments are major contributing factors for this projected decline in farm income.

The average annual deficiency payments for wheat and corn are expected to be lower by $51 and $26 million, respectively. The average annual deficiency payments for barley, oats and sorghum are also projected to be lower by $4, $2, and $4 million, respectively. Based on the levels of production, this loss in deficiency payments for different commodity crops, on average, translates into decrease of about 60 cents per bushel for wheat, 19 cents per bushel for corn, 13 cents per bushel for barley, 5 cents per bushel for oats, and 37 cents per bushel for sorghum.

Since the base acres for wheat, barley, and oats are mostly in the northern half of the state, the impact of the decrease in deficiency payments for these grains will be mainly in the northern half of the state. Most of the corn base is established in the eastcentral and southeastern parts of the state. Therefore, the impact of a loss of about $26 million in corn deficiency payments per year will be concentrated in these areas. The sorghum base is mostly in the southcentral part of the state. Therefore, the impact of the loss of $4 million per year in sorghum deficiency payments will be concentrated in this area.

Under the Full Flex, scenario compared to the Baseline scenario, projected annual cash receipts for major crops and livestock production are $42 million more, mainly due to increased value of livestock production. Direct government payments under the Full Flex scenario are even lower than the Baseline scenario -- by $18 million per year. Net farm income under the Full Flex scenario is projected to be $24 million more compared to the Baseline scenario.

Under the Flex No Pay scenario, the projected annual cash receipts for major crops and livestock production are $44 million higher than the baseline projections. This is primarily due to increased value of livestock products. Direct government payments under this scenario are expected to be about $7 million per year less than in the Baseline scenario. As a result, under this scenario, annual net farm income is expected to be $37 million more than in the Baseline scenario. All three scenarios are very similar. The Flex No Pay scenario may be preferable from the standpoint of South Dakota farmers, as the annual net farm income under this scenario is projected to be marginally higher than in the other two scenarios.

Notes

1/ The description of these scenarios draws heavily on Meyers (1990).

2/ For 1986/87-90/91, the average wheat program participation rate, in South Dakota, is estimated to be 89.6%. Under the Baseline, during the next five years, the average wheat program participation rate is projected to drop to 85.6%. Similarly, for the period of 1986/87-90/91, the average corn program participation rate, in South Dakota, is estimated to be 90.5%. Under Baseline, during the next five years, the average corn program participation rate is projected to drop to 85.2%.

3/ For 1986/87-90/91, the average deficiency payment for wheat, in South Dakota, is estimated to be $1.07/bu. Under the Baseline, during the next five years, the average deficiency payment for wheat, in South Dakota, is projected to drop to $0.66/bu. Similarly, for 1986/87-90/91, the average deficiency payment for corn, In South Dakota, is estimated to be $0.77/bu. Under the Baseline, during the next five years, the average deficiency payment for corn, in South Dakota, is projected to drop to $0.70/bu.

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Appendix I. Estimated Linkage Equations for South Dakota Agricultural Sector.[1]

Corn

		R sq.	D.W.	Tech.
Acres Planted:	COAPASD = 65.8357 + 0.0442 COAPAUS + 239.527 DUM63 (0.1420) (8.5687) (1.7972) - 483.564 DUM76 - 520.447 DUM77 (3.1231) (3.3837)	0.71	2.17	C.O.
Acres Harvested:	COAHASD = 648.909 + 0.5588 COAPASD + 332.716 DUM63 (1.4091) (4.1803) (1.7879) - 987.532 DUM76 (5.4348)	0.74	2.05	C.O.
Yield:	COYSD = - 22.001 + 0.8482 COYUS (2.308) (8.310)	0.83	1.97	C.O.
Price:	COPFMSD = 0.00677 + 0.9588 COPFMUS (0.04859) (13.857)	0.88	1.99	OLS
Production:	COSPRSD = COAHASD * COYSD			
Value:	COVSD = COSPRSD * COPFMSD			

Soybeans

		R sq.	D.W.	Tech.
Acres Planted:	SBAPASD = 7977.59 + 0.01145 SBAPAUS + 96.7688 TREND (0.8140) (1.9934) (0.9631)	0.95	1.57	C.O.
Acres Harvested:	SBAHASD = 4.8576 + 0.9893 SBAPASD (1.5234) (210.055)	0.99	2.27	OLS
Yield:	SBYSD = - 18.5064 + 1.5356 SBYUS (3.6370) (8.4314)	0.74	1.66	OLS
Price:	SBPFMSD = 0.0138 + 0.9721 SBPFMUS (0.0528) (18.4125)	0.88	2.12	C.O.
Production:	SBSPRSD = SBAHASD * SBYSD			
Value:	SBVSD = SBSPRSD * SBPFMSD			

1/ Numbers in parenthesis are t ratios.
D.W. = Durbin Watson Statistics.
C.O. = Cochran-Orcutt.
OLS = Ordinary Least Squares.

Wheat

		R sq.	D.W.	Tech.
Acres Planted:	WHAPASD = - 364.195 + 0.0522 WHAPAUS (0.5169) (5.1258)	0.82	1.98	C.O.
Acres Harvested:	WHAHASD = 279.730 + 0.7992 WHAPASD (1.7614) (15.9500)	0.91	1.80	OLS
Yield:	WHYSD = - 11.3436 + 1.1149 WHYUS + 10.5994 DUM67 (3.0705) (9.5660) (3.8994) + 9.2287 DUM76 - 6.7541 DUM80 (3.4926) (2.5478)	0.83	1.97	OLS
Price:	WHPFMSD = 0.00325 + 0.99303 WHPFMUS (0.0152) (12.8471)	0.91	1.92	C.O.
Production:	WHSPRSD = WHAHASD * WHYSD			
Value:	WHVSD = WHSPRSD * WHPFMSD			

Barley

		R sq.	D.W.	Tech.
Acres Planted:	BAAPASD = 347.100 + 0.04541 BAAPAUS (0.6608) (3.1854)	0.80	1.88	C.O.
Acres Harvested:	BAAHASD = - 19.2055 + 0.9528 BAAPASD (0.5958) (16.8326)	0.92	2.02	OLS
Yield:	BAYSD = 0.9159 + 0.7699 BAYUS - 19.0256 DUM76 + 8.9071 DUM84 (0.1429) (5.4098) (3.9983) (1.8094)	0.71	2.01	OLS
Price:	BAPFMSD = - 0.14317 + 0.9739 BAPFMUS (1.4462) (18.5545)	0.97	1.71	C.O.
Production:	BASPRSD = BAAHASD * BAYSD			
Value:	BAVSD = BASPRSD * BAPFMSD			

Sorghum

		R sq.	D.W.	Tech.
Acres Planted:	SGAPASD = 125.707 + 0.02004 SGAPAUS + 142.438 DUM64 (1.4072) (3.9161) (3.467) + 118.199 DUM81 (2.9100)	0.66	1.59	C.O.
Acres Harvested:	SGAHASD = 24.365 + 0.5932 SGAPASD + 109.081 DUM76 (0.3358) (3.9067) (2.1722)	0.64	2.29	C.O.

		R sq.	D.W.	Tech.
Yield:	SGYSD = 5.1899 + 0.6367 SGYUS - 12.6471 DUM76 (0.4557) (3.1251) (1.8332)	0.48	1.68	C.O.
Price:	SGPFMSD = 0.02215 + 0.8756 SGPFMUS (0.1855) (13.3324)	0.87	2.13	OLS
Production:	SGSPRSD = SGAHASD * SGYSD			
Value:	SGVSD = SGSPRSD * SGPFMSD			

Oats

		R sq.	D.W.	Tech.
Acres Planted:	OAAPASD = 10069.3 + 0.05189 OAAPAUS - 106.463 TREND (0.5862) (1.8056) (0.5574)	0.81	2.11	C.O.
Acres Harvested:	OAAHASD = - 472.145 + 1.0539 OAAPASD (1.79445) (9.7031)	0.79	1.65	OLS
Yield:	OAYSD = - 22.3880 + 1.3065 OAYUS (2.7909) (8.4010)	0.74	2.09	OLS
Price:	OAPFMSD = - 0.06242 + 1.02475 OAPFMUS (1.3398) (25.7522)	0.96	2.23	OLS
Production:	OASPRSD = OAAHASD * OAYSD			
Value:	OAVSD = OASPRSD * OAPFMSD			

Hogs

		R sq.	D.W.	Tech.
Production:	HOSPRSD = - 171397 + 58.4161 HOSPRUS (1.213) (6.5976)	0.72	2.06	C.O.
Price:	HOPFMSD = - 0.7899 + 1.01858 HOPFMUS (4.0249) (184.688)	0.99	2.05	OLS
Value:	HOPXQSD = HOSPRSD * HOPFMSD			

Cattle and Calves

		R sq.	D.W.	Tech.
Production:	CCSPRSD = 759484 + 41.2675 CCSPRUS + 266989 DUM74 (4.0987) (4.8147) (3.977) - 500122 DUM75 + 278555 DUM86 (3.9770) (2.2039)	0.66	1.08	OLS

		R sq.	D.W.	Tech.
Price:	CCPFMSD = - 3.3712 + 1.01123 CCPFMUS (4.0249) (184.688)	0.98	1.83	C.O.
Receipts:	CCRECSD = - 15876.7 + 0.01078 CCPXQSD (1.4695) (39.1280)	0.84	1.95	C.O.
Value:	CCPXQSD = CCSPRSD * CCPFMSD			

Milk

		R sq.	D.W.	Tech.
Production:	LGSPRSD = 453.587 + 0.00215 LGSPRUS + 12.0063 TREND (1.4844) (0.6455) (2.4046) + 84.7012 DUM68 - 127.932 DUM75 (1.7719) (2.6007)	0.86	1.24	C.O.
Price:	LGPFMSD = - 1.3232 + 1.0392 LGPFMUS (13.031) (98.1528)	0.99	1.93	C.O.
Value:	LGPXQSD = LGSPRSD * LGPFMSD			

Other Equations

		R sq.	D.W.	Tech.
Nonmoney Income:	HCSD = 54009.8 + 105501 PCNDF (10.8256) (37.8231)	0.98	1.90	OLS
Total Cash Reciepts:	TAGRECSD = 0.71474 CRVSD + 1.36614 LRVSD (2.69381) (6.66254)	0.94	1.81	C.O.
Total Prod. Expenses:	TPEXSD = 31.4191 + 18.5801 TPEXUS (0.4977) (27.7156)	0.99	2.07	C.O.
Total Cash Prod. Expenses:	CEXSD = 30.0851 + 18.3701 CEXUS (0.5811) (28.0073)	0.99	2.06	C.O.

Value of Crops: CRVSD = COVSD + SBVSD + WHVSD + BAVSD + SGVSD + OAVSD

Value of Livestock: LRVSD = CCPXQSD + HOPXQSD + LGPXQSD

Cash Farm Income: TAGRECSD + GPSD - CEXSD

Net Farm Income: TAGRECSD + GPSD + HCED - TPEXSD

Where: BAAHASD = South Dakota Barley Acres Harvested, 1,000 acres.
BAAPASD = South Dakota Barley Acres Planted, 1,000 acres.
BAPFMSD = South Dakota Barley Price Paid to Farmers, $/bu.
BASPRSD = South Dakota Barley Production, 1,000 bu.
BAYSD = South Dakota Barley Yield, bu./acre.
BAVSD = South Dakota Value of Barley Production, $1,000.

COAHASD = South Dakota Corn Acres Harvested, 1,000 acres.
COAPASD = South Dakota Corn Acres Planted, 1,000 acres.
COPFMSD = South Dakota Corn Price Paid to Farmers, $/bu.
COSPRSD = South Dakota Corn Production, 1,000 bu.
COYSD = South Dakota Corn Yield, bu./acre.
COVSD = South Dakota Value of Corn Production, $1,000.
OAAHASD = South Dakota Oats Acres Harvested, 1,000 acres.
OAAPASD = South Dakota Oats Acres Planted, 1,000 acres.
OAPFMSD = South Dakota Oats Price Paid to Farmers, $/bu.
OASPRSD = South Dakota Oats Production, 1,000 bu.
OAYSD = South Dakota Oats Yield, bu./acre.
OAVSD = South Dakota Value of Oats Production, $1,000.
SBAHASD = South Dakota Soybean Acres Harvested, 1,000 acres.
SBAPASD = South Dakota Soybean Acres Planted, 1,000 acres.
SBPFMSD = South Dakota Soybean Price Paid to Farmers, $/bu.
SBSPRSD = South Dakota Soybean Production, 1,000 bu.
SBYSD = South Dakota Soybean Yield, bu./acre.
SBVSD = South Dakota Value of Soybean Production, $1,000.
SGAHASD = South Dakota Sorghum Acres Harvested, 1,000 acres.
SGAPASD = South Dakota Sorghum Acres Planted, 1,000 acres.
SGPFMSD = South Dakota Sorghum Price Paid to Farmers, $/bu.
SGSPRSD = South Dakota Sorghum Production, 1,000 bu.
SGYSD = South Dakota Sorghum Yield, bu./acre.
SGVSD = South Dakota Value of Sorghum Production, $1,000.
WHAHASD = South Dakota Wheat Acres Harvested, 1,000 acres.
WHAPASD = South Dakota Wheat Acres Planted, 1,000 acres.
WHPFMSD = South Dakota Wheat Price Paid to Farmers, $/bu.
WHSPRSD = South Dakota Wheat Production, 1,000 bu.
WHYSD = South Dakota Wheat Yield, bu./acre.
WHVSD = South Dakota Value of Wheat Production, $1,000.
CCSPRSD = South Dakota Cattle and Calves Production, 1,000 lbs.
CCPFMSD = S.D. Cattle and Calves Price Received by Farmers, $/100 lbs.
CCPXQSD = South Dakota Value of Cattle and Calves Production, $1,000.
HOSPRSD = South Dakota Hogs Production, 1,000 lbs.
HOPFMSD = South Dakota Hogs Price received by Farmers, $/100 lbs.
HOPXQSD = South Dakota Value of Hog Production, $1,000.
LGSPRSD = South Dakota Milk Production, million lbs.
LGPFMSD = South Dakota Milk Price Received by Farmers, $/100 Lbs.
LGPXQSD = South Dakota Value of Milk Production, $1,000.
HCSD = South Dakota Nonmoney Income, $1,000.
TAGRECSD= S.D. Total Ag. Receipts (Total Cash Receipts), $1,000.
CRVSD = South Dakota Value of Crops, $1,000.
LRVSD = South Dakota Value of Livestocks, $1,000.
TPEXSD = South Dakota Total Production Expenses, $1,000.
CEXSD = South Dakota Total Cash Production Expenses, $1,000.
GPSD = South Dakota Total Government Expenses, $1,000.
COAPAUS = US Corn Acres Planted, 1,000 acres.
COPFMUS = US Corn Price Paid to Farmers, $/bu.
COYUS = US Corn Yield, bu./acre.
SBAPAUS = US Soybean Acres Planted, 1,000 acres.
SBPFMUS = US Soybean Price Paid to Farmers, $/bu.
SBYUS = US Soybean Yield, bu./acre.
WHAPAUS = US Wheat Acres Planted, 1,000 acres.
WHPFMUS = US Wheat Price Paid to Farmers, $/bu.

WHYUS = US Wheat Yield, bu./acre.
BAAPAUS = US Barley Acres Planted, 1,000 acres.
BAPFMUS = US Barley Price Paid to Farmers, $/bu.
BAYUS = US Barley Yield, bu./acre.
SGAPAUS = US Sorghum Acres Planted, 1,000 acres.
SGPFMUS = US Sorghum Price Paid to Farmers, $/bu.
SGYUS = US Sorghum Yield, bu./acre.
OAAPAUS = US Oats Acres Planted, 1,000 acres.
OAPFMUS = US Oats Price Paid to Farmers, $/bu.
OAYUS = US Oats Yield, bu./acre.
HOSPRUS = US Hog production, 1,000 lbs.
HOPFMUS = US Hog Price received to Farmers, $/100 lbs.
CCSPRUS = US Cattle & Calves production, 1,000 lbs.
CCPFMUS = US Cattle & Calves Price recieved by Farmers, $/100 lbs.
LGSPRUS = US Milk Production, million lbs.
LGPFMUS = US Milk Price recieved to Farmers, $/100 lbs.
TPEXUS = US Total Production Expenses, $1,000.
CEXUS = US Total Cash Production Expenses, $1,000.
PCNDF = Consumer Price Index (1967=1.00)
DUM## = Intercept Shifter (Year 19##=1, else=0).
TREND = Intercept Shifter, (1961=61, 1962=62, ..., 1987=87).

Appendix II. Baseline Projections for Selected Variables, South Dakota, 1989/90 - 1995/96.

Variables	86/87 a/	87/88 a/	88/89 b/	89/90	90/91	91/92	92/93	93/94	94/95	95/96	86-90 AVG.	91-95 AVG.
ACRES PLANTED:					million acres							
Wheat	4.065	3.660	3.644	4.224	4.365	4.271	4.292	4.349	4.318	4.333	3.991	4.312
Corn	3.300	3.100	3.162	3.370	3.498	3.440	3.454	3.427	3.414	3.418	3.286	3.431
Soybeans	1.350	1.400	1.408	1.429	1.391	1.368	1.381	1.398	1.395	1.403	1.396	1.389
Barley	0.930	0.870	0.820	0.793	0.820	0.802	0.811	0.802	0.806	0.811	0.847	0.806
Oats	1.500	1.400	1.422	1.328	1.277	1.282	1.271	1.282	1.287	1.282	1.385	1.281
Sorghum	0.450	0.362	0.332	0.378	0.376	0.372	0.376	0.370	0.366	0.364	0.380	0.370
ACRES HARVESTED:					million acres							
Wheat	3.840	3.528	3.192	3.655	3.768	3.693	3.710	3.756	3.731	3.743	3.597	3.726
Corn	2.850	2.750	2.416	2.532	2.603	2.571	2.579	2.564	2.557	2.559	2.630	2.566
Soybeans	1.330	1.390	1.388	1.409	1.371	1.349	1.361	1.378	1.375	1.383	1.378	1.369
Barley	0.855	0.850	0.762	0.736	0.762	0.745	0.753	0.745	0.749	0.753	0.793	0.749
Oats	1.050	1.150	1.026	0.928	0.873	0.879	0.868	0.879	0.884	0.879	1.005	0.878
Sorghum	0.305	0.270	0.221	0.249	0.248	0.245	0.248	0.244	0.242	0.240	0.259	0.244
COMMODITY PRICES:					dollars per bushel							
Wheat	2.42	2.50	3.69	3.78	3.20	3.15	3.32	3.24	3.33	3.50	3.12	3.31
Corn	1.37	1.55	2.44	2.21	1.97	2.04	1.96	1.91	1.94	1.99	1.91	1.97
Soybeans	4.58	5.00	7.16	5.44	4.89	5.67	5.88	5.31	5.55	5.86	5.41	5.65
Barley	1.38	1.40	2.57	2.23	1.79	1.84	1.83	1.83	1.87	1.92	1.87	1.86
Oats	1.28	1.65	2.61	1.48	1.53	1.61	1.64	1.64	1.64	1.67	1.71	1.64
Sorghum	1.16	1.29	2.01	1.86	1.67	1.73	1.70	1.79	1.72	1.76	1.60	1.72
LIVESTOCK PRODUCTION:					million pounds							
Cattle & Calves	1486.66	1762.66	1714.50	1703.19	1713.05	1729.89	1748.13	1755.81	1747.26	1716.27	1676.01	1739.47
Hogs	630.73	659.97	669.72	654.01	671.65	699.63	673.99	644.95	662.18	665.34	657.21	669.22
Milk	1781.00	1759.00	1769.07	1786.86	1804.71	1821.08	1836.53	1852.58	1868.84	1885.84	1780.13	1852.97
LVSTK. PRODUCTS PRICES:					dollars per 100 pounds							
Cattle & Calves	54.10	63.38	69.88	71.59	70.32	68.77	67.54	66.45	66.89	70.77	65.85	68.08
Hogs	49.42	52.31	44.14	46.07	45.00	41.82	44.54	47.68	44.14	45.45	47.39	44.73
Milk	11.60	11.70	12.72	11.86	11.12	10.64	10.18	10.04	10.11	10.93	11.80	10.38
FARM RECEIPTS & EXPENSES:					million dollars							
Value of Lvstk. Prod.	1322.58	1668.20	1718.70	1732.66	1707.39	1675.93	1667.76	1834.26	1649.91	1723.16	1629.91	1710.21
Value of Crop Prod.	894.60	1002.14	994.86	1167.06	1178.73	1235.37	1276.65	1254.55	1275.08	1347.20	1047.48	1277.77
Government Payments c/	382.90	504.80	496.00	200.73	265.79	273.99	267.55	278.78	252.14	227.19	370.04	259.93
Total Cash Receipts	2375.60	2726.40	2910.70	3052.86	3026.67	3024.18	3042.53	3016.47	3017.02	3168.63	2818.44	3053.77
Total Gross Returns	3082.50	3554.20	3721.70	3635.14	3687.81	3708.85	3736.08	3739.65	3733.47	3880.07	3536.27	3759.62
Total Prod. Expenses	2305.50	2417.90	2527.20	2545.36	2565.98	2639.38	2709.79	2778.35	2889.28	3000.76	2472.39	2803.51
FARM INCOME:					million dollars							
Net Cash Farm Income c/	934.70	1272.20	1211.00	1190.12	1210.51	1155.97	1124.52	1060.87	945.64	982.81	1163.71	1053.96
Net Farm Income c/ (Before Inv. Adj.)	777.00	1136.30	1100.30	1089.79	1121.82	1069.47	1026.28	961.29	844.20	879.31	1045.04	956.11

a/ The figures for years 86/87 and 87/88 are actual data.
b/ The figures for year 89/90 are preliminary estimates.
c/ Excluding drought payments ($94.20 million) in 1988/89.

Appendix III. Flexibility Scenario Projections for Selected Variables, South Dakota, 1989/90 - 1995/96.

Variables	86/87 a/	87/88 a/	88/89 b/	89/90	90/91	91/92	92/93	93/94	94/95	95/96	86-90 AVG.	91-95 AVG.
ACRES PLANTED:					million acres							
Wheat	4.065	3.660	3.644	4.224	4.365	4.359	4.354	4.412	4.391	4.412	3.992	4.386
Corn	3.300	3.100	3.166	3.370	3.498	3.361	3.410	3.365	3.352	3.330	3.287	3.364
Soybeans	1.350	1.400	1.408	1.429	1.391	1.437	1.450	1.468	1.464	1.473	1.396	1.458
Barley	0.930	0.870	0.820	0.793	0.820	0.797	0.797	0.793	0.797	0.797	0.847	0.796
Oats	1.500	1.400	1.422	1.328	1.277	1.287	1.287	1.287	1.287	1.287	1.385	1.287
Sorghum	0.450	0.362	0.332	0.378	0.376	0.372	0.368	0.370	0.362	0.360	0.380	0.367
ACRES HARVESTED:					million acres							
Wheat	3.840	3.528	3.192	3.655	3.768	3.764	3.760	3.806	3.789	3.806	3.597	3.785
Corn	2.850	2.750	2.418	2.532	2.604	2.527	2.554	2.529	2.522	2.510	2.631	2.528
Soybeans	1.330	1.390	1.388	1.409	1.371	1.416	1.429	1.447	1.444	1.452	1.378	1.438
Barley	0.855	0.850	0.762	0.736	0.762	0.740	0.740	0.736	0.740	0.740	0.793	0.740
Oats	1.050	1.150	1.026	0.928	0.873	0.884	0.884	0.884	0.884	0.884	1.005	0.884
Sorghum	0.305	0.270	0.221	0.249	0.248	0.245	0.243	0.244	0.239	0.238	0.259	0.242
COMMODITY PRICES:					dollars per bushel							
Wheat	2.42	2.50	3.69	3.78	3.20	3.04	3.20	3.16	3.25	3.40	3.12	3.21
Corn	1.37	1.55	2.44	2.21	1.97	2.17	2.05	2.02	2.04	2.17	1.91	2.09
Soybeans	4.58	5.00	7.16	5.44	4.89	5.04	5.13	4.84	4.89	4.96	5.41	4.97
Barley	1.38	1.40	2.57	2.23	1.79	1.90	1.90	1.91	1.95	2.04	1.87	1.94
Oats	1.28	1.65	2.61	1.48	1.53	1.63	1.64	1.64	1.66	1.71	1.71	1.66
Sorghum	1.16	1.29	2.01	1.86	1.67	1.79	1.74	1.76	1.76	1.86	1.60	1.78
LIVESTOCK PRODUCTION:					million pounds							
Cattle & Calves	1486.66	1762.66	1714.50	1703.19	1713.05	1737.40	1752.42	1752.09	1741.36	1730.96	1676.01	1742.85
Hogs	630.73	659.97	669.72	654.01	671.65	701.67	676.15	648.92	631.28	658.74	657.21	663.35
Milk	1781.00	1759.00	1769.07	1786.86	1804.71	1821.08	1836.53	1852.58	1868.84	1885.84	1780.13	1852.97
LVSTK. PRODUCTS PRICES:					dollars per 100 pounds							
Cattle & Calves	54.10	63.38	69.88	71.59	70.32	66.74	66.03	67.24	72.98	73.64	65.85	69.33
Hogs	49.42	52.31	44.14	46.07	45.00	41.12	43.93	47.34	51.64	48.68	47.39	46.54
Milk	11.60	11.70	12.72	11.86	11.12	10.64	10.18	10.04	10.11	10.93	11.80	10.38
FARM RECEIPTS & EXPENSES:					million dollars							
Value of Lvstk. Prod.	1322.58	1668.20	1718.70	1732.66	1707.39	1641.78	1641.09	1671.25	1785.66	1801.54	1629.91	1708.26
Value of Crop Prod.	894.60	1002.14	995.16	1167.06	1178.73	1233.85	1260.19	1258.20	1269.21	1346.80	1047.54	1273.65
Government Payments c/	382.90	504.80	401.80	200.73	265.79	253.68	259.33	261.95	238.30	196.78	351.20	242.01
Total Cash Receipts	2375.60	2726.40	2910.70	3052.86	3026.67	2976.44	2994.32	3034.11	3198.27	3275.42	2818.44	3095.71
Total Gross Returns	3082.50	3554.20	3627.49	3635.14	3687.81	3640.80	3679.64	3740.45	3900.88	3956.43	3517.43	3783.64
Total Prod. Expenses	2305.50	2417.90	2527.20	2545.36	2565.98	2639.37	2709.79	2778.35	2889.28	3000.76	2472.39	2803.51
FARM INCOME:					million dollars							
Net Cash Farm Income c/	934.70	1272.20	1210.99	1190.12	1210.51	1087.92	1068.09	1061.67	1113.05	1059.18	1163.71	1077.98
Net Farm Income c/ (Before Inv. Adj.)	777.00	1136.30	1100.30	1089.79	1121.82	1001.42	969.85	962.09	1011.61	955.68	1045.04	980.13

a/ The figures for years 86/87 and 87/88 are actual data.
b/ The figures for year 88/89 are preliminary estimates.
c/ Excluding drought payments ($94.20 million) in 1988/89.

Appendix IV. Flexibility No Pay Projections for Selected Variables, South Dakota, 1989/90 - 1995/96.

Variables	86/87 a/	87/88 a/	88/89 b/	89/90	90/91	91/92	92/93	93/94	94/95	95/96	86-90 AVG.	91-95 AVG.
ACRES PLANTED:					million acres							
Wheat	4.065	3.660	3.644	4.223	4.365	4.281	4.292	4.349	4.318	4.349	3.991	4.318
Corn	3.300	3.100	3.166	3.370	3.498	3.396	3.440	3.423	3.418	3.396	3.287	3.415
Soybeans	1.350	1.400	1.408	1.429	1.391	1.389	1.384	1.397	1.400	1.406	1.396	1.395
Barley	0.930	0.870	0.820	0.793	0.820	0.797	0.811	0.793	0.806	0.802	0.847	0.802
Oats	1.500	1.400	1.422	1.328	1.277	1.266	1.277	1.287	1.287	1.287	1.385	1.281
Sorghum	0.450	0.362	0.332	0.378	0.376	0.368	0.378	0.364	0.364	0.358	0.380	0.367
ACRES HARVESTED:					million acres							
Wheat	3.840	3.528	3.192	3.655	3.768	3.701	3.710	3.756	3.731	3.756	3.597	3.731
Corn	2.850	2.750	2.418	2.532	2.603	2.547	2.571	2.562	2.559	2.547	2.631	2.557
Soybeans	1.330	1.390	1.388	1.409	1.371	1.369	1.364	1.377	1.380	1.386	1.378	1.375
Barley	0.855	0.850	0.762	0.736	0.762	0.740	0.753	0.736	0.749	0.745	0.793	0.745
Oats	1.050	1.150	1.026	0.928	0.873	0.862	0.873	0.884	0.884	0.884	1.005	0.878
Sorghum	0.305	0.270	0.221	0.249	0.248	0.243	0.249	0.240	0.240	0.237	0.259	0.242
COMMODITY PRICES:					dollars per bushel							
Wheat	2.42	2.50	3.69	3.78	3.20	3.15	3.28	3.23	3.33	3.51	3.12	3.30
Corn	1.37	1.55	2.44	2.21	1.97	2.14	1.95	1.93	1.91	2.08	1.91	2.00
Soybeans	4.58	5.00	7.16	5.44	4.89	5.25	5.62	5.35	5.45	5.75	5.41	5.48
Barley	1.38	1.40	2.57	2.23	1.79	1.90	1.82	1.86	1.85	1.99	1.87	1.89
Oats	1.28	1.65	2.61	1.48	1.53	1.66	1.65	1.64	1.64	1.69	1.71	1.66
Sorghum	1.16	1.29	2.01	1.86	1.67	1.79	1.69	1.72	1.70	1.84	1.60	1.75
LIVESTOCK PRODUCTION:					million pounds							
Cattle & Calves	1486.66	1762.66	1714.50	1703.19	1713.05	1737.40	1752.42	1752.09	1741.36	1730.96	1676.01	1742.85
Hogs	630.73	659.97	669.72	654.01	671.65	701.67	676.15	648.92	631.28	658.74	657.21	663.35
Milk	1781.00	1759.00	1769.07	1786.86	1804.71	1821.08	1836.53	1852.58	1868.84	1885.84	1780.13	1852.97
LVSTK. PRODUCTS PRICES:					dollars per 100 pounds							
Cattle & Calves	54.10	63.38	69.88	71.59	70.32	66.74	66.03	67.24	72.98	73.64	65.85	69.33
Hogs	49.42	52.31	44.14	46.07	45.00	41.12	43.93	47.34	51.64	48.68	47.39	46.54
Milk	11.60	11.70	12.72	11.86	11.12	10.64	10.18	10.04	10.11	10.93	11.80	10.38
FARM RECEIPTS & EXPENSES:					million dollars							
Value of Lvstk. Prod.	1322.58	1668.20	1718.70	1732.66	1707.39	1641.78	1641.09	1671.25	1785.66	1801.54	1629.91	1708.26
Value of Crop Prod.	894.60	1002.14	995.15	1167.06	1178.73	1240.60	1257.36	1259.67	1262.02	1365.87	1047.54	1277.10
Government Payments c/	382.90	504.80	401.80	200.73	265.79	248.72	273.77	274.92	260.21	207.38	351.20	253.00
Total Cash Receipts	2375.60	2726.40	2910.70	3052.86	3026.67	2981.26	2992.29	3035.16	3193.13	3289.05	2818.44	3098.18
Total Gross Returns	3082.50	3554.20	3627.50	3635.14	3687.81	3640.66	3692.07	3754.46	3917.65	3980.67	3517.43	3797.10
Total Prod. Expenses	2305.50	2417.90	2527.20	2545.36	2565.98	2639.38	2709.79	2778.35	2889.28	3000.76	2472.39	2803.51
FARM INCOME:					million dollars							
Net Cash Farm Income c/	934.70	1272.20	1211.00	1190.12	1210.51	1087.78	1080.51	1075.69	1129.82	1083.41	1163.71	1091.44
Net Farm Income c/ (Before Inv. Adj.)	777.00	1136.30	1100.30	1089.79	1121.82	1001.28	982.27	976.11	1028.37	979.91	1045.04	993.59

a/ The figures for years 86/87 and 87/88 are actual data.
b/ The figures for year 88/89 are prelimnary estimates.
c/ Excluding drought payments ($94.20 million) in 1988/89.