

FAPRI ANALYSIS OF THE FLEXIBLE FALLOW PROGRAM

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EXECUTIVE SUMMARY

At the request of Senator Tom Harkin, FAPRI has analyzed the impacts of a farm policy proposal known as the Flexible Fallow program. The program is not proposed as a replacement to the FAIR Act, but instead an additional feature to the existing legislation. The basic premise of the program is to give producers the option to voluntarily idle a portion of their acreage in exchange for higher loan rates on their remaining production. Set-aside rates under the program are calculated as a percent of the planted acreage of that crop. Producers can choose to participate at any level between 0% and 30%.

Given the weak prices in the early years of the FAPRI baseline, participation in the voluntary set-aside program is expected to be high. Due to the relative profitability of the program, cotton is expected to have the highest participation among the eight major crops. On a regional basis, the plains states are expected to have the highest participation.

Participation in the Flexible Fallow program leads to reduced plantings relative to the baseline. In the first year of the analysis, it is estimated that 35 million acres will be idled under the program. However, due to slippage, plantings fall by only 22 million acres. By the end of the analysis period, participation in the program is expected to decline due to stronger market prices.

Reduced plantings translate into higher crop prices under the Flexible Fallow program. Crop prices average 7-10% above baseline levels in the early years of the analysis. By the end of the analysis, prices average 3-5% above baseline levels.

The effects of reduced plantings and higher crop prices are felt in a number of sectors. The volume and value of U.S. crop exports decline relative to baseline levels by an average of 7% and 4%, respectively. With reduced plantings, farmers reduce expenditures for seed, fertilizers, and chemicals by an average of \$1.2 billion.

Higher crop prices translate into increased feed expenses for the livestock sector. Livestock producers respond by reducing production, which leads to higher livestock prices. Over the analysis period, net income to the livestock sector falls by an average of \$600 million.

Gains by the crops sector more than offset the declines in livestock income. For the total agricultural economy, net farm income increases by an average of \$4.8 billion above baseline levels. Increased government outlays of \$2.5 billion account for a substantial portion of the increase.

Higher farm-gate prices lead to additional food expenditures by consumers. Over the 2000-08 period, food expenditures increase by an annual average of \$1.6 billion, or \$5.74 per person. The increase is 0.3% above baseline levels.

FAPRI ANALYSIS OF THE FLEXIBLE FALLOW PROPOSAL

The Food and Agricultural Policy Research Institute (FAPRI), located at the University of Missouri and Iowa State University, has analyzed the impacts of a farm policy proposal known as the Flexible Fallow program. The analysis was done at the request of Senator Tom Harkin, ranking Democratic member of the Senate Committee on Agriculture, Nutrition, and Forestry, with supporting interest from Senators Tom Daschle and Tim Johnson of South Dakota. All assumptions used in the analysis were determined and approved through consultations with Congressional staff from the three offices, as well as with Phil Cyre and Craig Blindert, who developed the program.

The basic premise of the Flexible Fallow program is to give producers the option to voluntarily idle a portion of their acreage in exchange for higher loan rates on their remaining production. The program is not proposed as a replacement to the 1996 Federal Agriculture Improvement and Reform (FAIR) Act, but instead an additional feature added to the existing legislation. Direct contract payments under the FAIR Act would continue to be made to producers who chose the Flexible Fallow option. In addition, the planting flexibility of the FAIR Act would remain in place under the scenario.

Scenario Assumptions

The impacts of the Flexible Fallow scenario are measured against the FAPRI January 1999 U.S. Agricultural Outlook, which will be referred to as the baseline throughout the report. Details of the FAPRI baseline can be found in Staff Report 1-99 or accessed at <http://www.fapri.iastate.edu>. The analysis period covers the 2000-08 crops. Detailed impact tables included in the Appendix.

Unlike most historical land-idling programs where set-aside rates were calculated as a percentage of base acreage, the rates under the Flexible Fallow program are calculated as a percent of the planted acreage of that crop. Producers can choose to participate at any level between 0% and 30%. For example, suppose a producer has 1,000 acres of land that are typically devoted to the production of corn and soybeans. If the producer chose to participate at 25% set-aside for both corn and soybeans, 400 acres could be planted to each crop and the remaining 200 acres devoted to conserving use. This is just one choice from a variety of options facing the producer. It is possible to participate at different rates for different crops. Suppose the producer planted 600 acres of corn and 200 acres of soybeans. To participate at 30% for corn, 180 acres must be designated as corn set-aside and then use the remaining 20 acres as soybean set-aside and qualify for the 10% rate on soybeans.

The loan rate schedule is a key feature of the program, determining the profitability of the program as well as the potential costs of the program. With the exception of wheat and soybeans, the base loan rates for 0% idling are set at current 1999 levels. The wheat loan rate is increased from \$2.58 per bushel up to \$2.75, while the soybean loan rate is lowered to \$4.72 per bushel, as compared to the current rate of \$5.26. For a producer choosing the 0% set-aside, the program is the same as the current FAIR Act with the exception of the change in loan rates for wheat and soybeans. Also, the base loan rates are assumed to remain the same for each year of the analysis. This also

represents a change from the baseline where loan rates were adjusted downward as determined by the moving average of market prices.

Specific loan rates for corn, wheat, soybeans, cotton, and rice are given in Table 1. For corn, wheat and soybeans, loan rates increase by 1¢ for each 1% increase in the set-aside rate for rates between 1% and 10%. For set-aside rates between 11% and 30%, an additional 1-cent credit is awarded for corn. For wheat and soybeans, the additional credits are 1.5 and 2 cents, respectively. Additional credits are awarded to compensate for the increased productivity of idled acres as the set-aside rate increases. For cotton and rice, a constant increase is used for each increase in the set-aside rate. An increase of 0.76 cents per pound is assumed for cotton, while the growth in the rice loan rate is 10 cents per hundredweight.

Table 1. Loan Rate Schedules Under the Flexible Fallow Program

Set-Aside Rate	Corn \$/Bu	Wheat \$/Bu	Soybeans \$/Bu	Cotton \$/Lb	Rice \$/Cwt
0%	1.89	2.75	4.72	0.5192	6.50
1%	1.91	2.78	4.77	0.5268	6.60
2%	1.93	2.81	4.81	0.5344	6.70
3%	1.95	2.83	4.86	0.5420	6.80
4%	1.97	2.86	4.91	0.5496	6.90
5%	1.99	2.89	4.96	0.5572	7.00
6%	2.01	2.92	5.01	0.5648	7.10
7%	2.03	2.95	5.06	0.5724	7.20
8%	2.05	2.98	5.11	0.5800	7.30
9%	2.07	3.01	5.16	0.5876	7.40
10%	2.09	3.04	5.21	0.5952	7.50
11%	2.12	3.08	5.29	0.6028	7.60
12%	2.15	3.13	5.36	0.6104	7.70
13%	2.18	3.17	5.43	0.6180	7.80
14%	2.21	3.22	5.51	0.6256	7.90
15%	2.24	3.27	5.58	0.6332	8.00
16%	2.28	3.31	5.65	0.6408	8.10
17%	2.31	3.36	5.73	0.6484	8.20
18%	2.34	3.41	5.81	0.6560	8.30
19%	2.37	3.46	5.88	0.6636	8.40
20%	2.41	3.51	5.96	0.6712	8.50
21%	2.44	3.55	6.04	0.6788	8.60
22%	2.47	3.60	6.12	0.6864	8.70
23%	2.51	3.65	6.19	0.6940	8.80
24%	2.54	3.70	6.27	0.7016	8.90
25%	2.57	3.75	6.35	0.7092	9.00
26%	2.61	3.80	6.43	0.7168	9.10
27%	2.64	3.85	6.51	0.7244	9.20
28%	2.68	3.90	6.60	0.7320	9.30
29%	2.71	3.95	6.68	0.7396	9.40
30%	2.75	4.01	6.76	0.7472	9.50

The Decision to Participate in Flexible Fallow

Participation in the Flexible Fallow program would be a voluntary decision for producers, influenced by a variety of factors. Expected returns from planting versus idling a portion of the acreage are primary considerations, but weather, agronomic factors, and slippage would also be factored into the decision. Slippage will be discussed later. First, the calculations to determine the relative returns from planting versus idling will be explained.

Assume the producer has an acre on which he can choose to plant all or leave a portion idle. Choosing to plant the entire acre is the same as participating at 0% set-aside. The net returns from this acre (NR_0) are given by the following formula:

$$NR_0 = [PF + \max(0, LR_0 - \delta * PF)] * Y - C,$$

Where

PF = expected farm price

LR_0 = loan rate at 0% set-aside

Y = yield

C = variable cost

δ = factor relating loan repayment price to the farm price.

This formula incorporates the return from selling the crop on the market as well as the potential loan deficiency payment (LDP) if prices fall below the loan rate. For a producer choosing to participate at a set-aside rate S, he would plant $1/(1+S)$ of the acre and idle an amount equal to $S/(1+S)$. The net return from that acre is given by the formula

$$NR_S = \{[PF + \max(0, LR_S - \delta * PF)] * Y - C\} / (1 + S),$$

Where

LR_S = loan rate at set-aside rate S.

It should be noted that no explicit costs are incorporated for maintaining set-aside acres.

Assuming U.S. average costs of production and yields for corn, Figure 1 illustrates the expected per-acre returns associated with various set-aside rates and market prices. The corn price is increased from \$1.75 per bushel up to \$3.25. When prices are low, net returns are higher if the producer idles a portion of the acreage and plants the remainder. Because of the increasing loan rates, 30% set-aside yields a higher return than either the 10% or 20% option. As prices increase, the decision to plant becomes more attractive. If the market price is sufficiently high, the producer will favor the 0% option. **The graph suggests that based solely on returns, the most attractive option will be either 0% or 30%.**

There will be a price where the returns for planting exceed those for idling a portion of the acreage. For corn, the switch-over price is \$2.41 per bushel based on average costs and yields. For some producers, it will take a higher price to switch from idling to planting, while others will find it more profitable to plant at lower prices. Switch-over prices have also been calculated for the other crops. For wheat, the price is found to be \$3.53 per bushel, and the soybean price is \$5.75 per bushel. For cotton and rice, the switch-over prices are \$0.76 per pound and \$9.87 per cwt., respectively.

It should be noted that the cotton and rice rates are in excess of the loan rate associated with 30% set-aside. This result is due to the fact that there is a substantial gap between the loan repayment price, which is the adjusted world price (AWP) for cotton and rice, and the price received by farmers. As a side note, the switch-over price (PF^S) can be calculated by solving the equation $NR_0 = NR_S$ for PF . The resulting formula is

$$PF^S = LR_S / (S + \delta) + S * C / ((S + \delta) * Y).$$

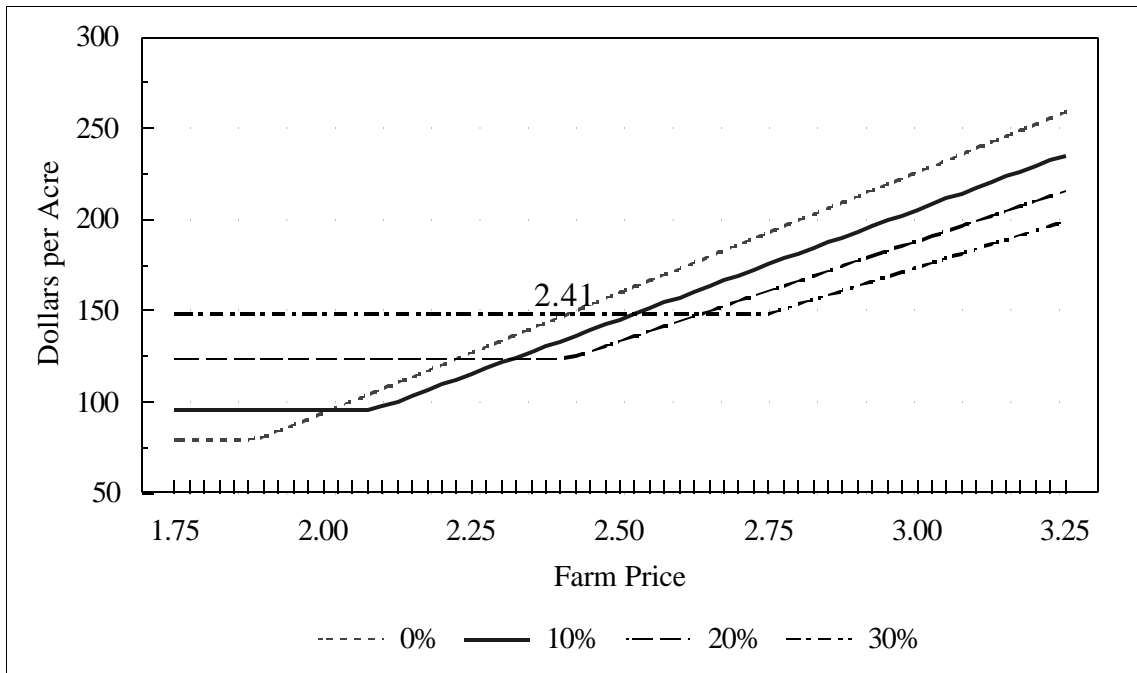


Figure 1. Corn Net Returns at Selected Levels of Set-Aside

Program Participation

Across all major crops, prices in the early years of the FAPRI baseline average below the calculated switch-over prices. For example, corn prices under the baseline are projected to average \$2.14 per bushel for the 2000-03 crop years. Soybean prices average \$5.32 per bushel, while cotton prices are projected to average only \$0.57 per pound. All are well within the range where the most attractive alternative is to idle acreage equal to 30% of plantings. As a result, participation is expected to be quite high in the early years and then decline in the longer term as prices are projected to strengthen in the baseline.

The level of set-aside at which a person chooses to participate is a critical assumption in the analysis. It determines the acreage planted and the qualifying loan rate that applies to that production. This, in turn, has significant implications for the cost of the program. In this analysis, the majority of participants are assumed to be doing so at the 30% level. As mentioned earlier, net returns suggest that if a producer is going to idle acreage, the maximum rate is the most profitable. However, the analysis does not assume

that all participation occurs at the maximum because there will be circumstances where some producers will participate at lower levels.

For this analysis, the participation and acreage impacts for each crop are evaluated on a regional basis according to the following nine production regions:

Corn Belt – Illinois, Indiana, Iowa, Missouri, Ohio

Central Plains – Colorado, Kansas, Nebraska

Delta States – Arkansas, Louisiana, Mississippi

Far West – Arizona, California, Idaho, Nevada, Oregon, Utah, Washington

Lake States – Michigan, Minnesota, Wisconsin

Northeast – Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia

Northern Plains – Montana, North Dakota, South Dakota, Wyoming

Southeast – Alabama, Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia

Southern Plains – Oklahoma, New Mexico, Texas.

In general, relative returns suggest that participation rates will be higher in the plains states and southern United States. These regions generally have higher costs and lower yields, both increasing the incentive to idle land. Given the weak prices in the FAPRI baseline and the relatively high cost of production, cotton is projected to have the highest participation rate among the eight commodities. This also contributes to the higher participation rates observed in regions of the southern United States. Regional participation rates, defined as (participant plantings + idled area)/(total plantings + idled area), are shown in Figure 2 for the years 2000 and 2008. Declines in participation longer term reflect the stronger prices projected in the FAPRI baseline.

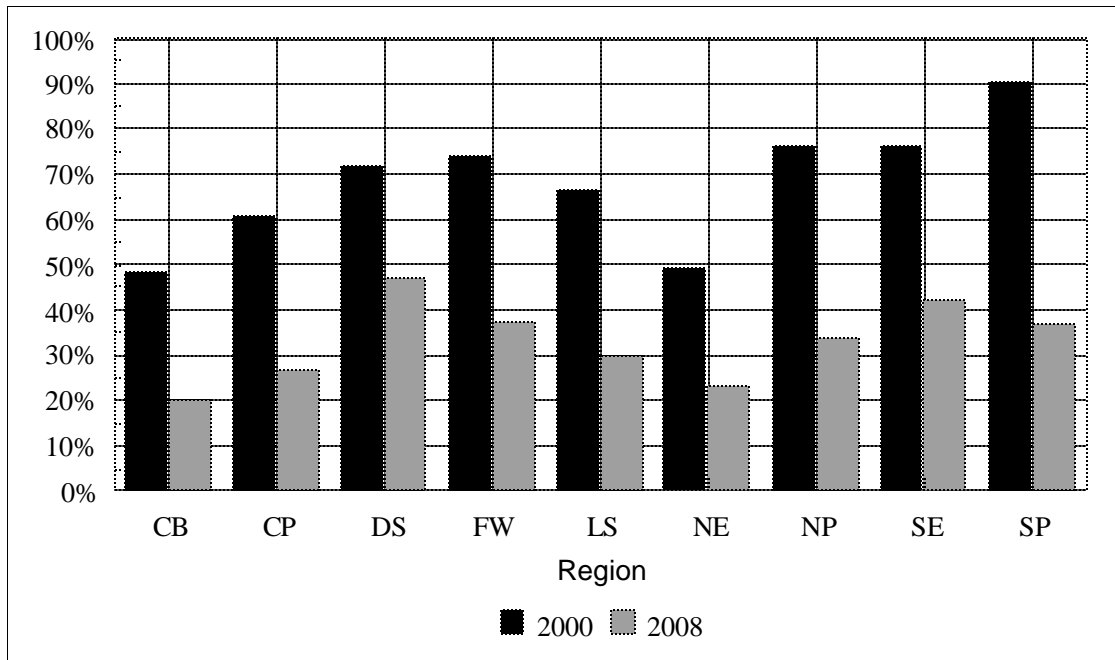


Figure 2. Program Participation by Region

Slippage

Slippage refers to the extent to which idled area impacts crop production. This includes both the impacts on area as well as the impact on average yields. When a producer decides to idle area, the first acres idled will be those with marginal productivity. The average yield on the remaining acres will be higher, so the impact on production will be less than the impact on area.

In many cases, the impact on plantings will also not be one-for-one with idled area. For example, a producer may have acreage that would not have been planted for a variety of reasons, but could qualify as idled area under this program. This would allow the producer to receive the higher loan rate on his production without having altered his production decisions. Historical data on past acreage idling programs suggest there is a larger degree of slippage in the Plains than in the Corn Belt. Given the fallow and grazing practices in the plains, such a result is not surprising. In areas with high slippage, many producers could qualify for the loan rate associated with a low set-aside rate without substantially affecting plantings. Only at higher set-aside rates would plantings show a significant decline. Slippage ultimately makes the program more costly to the government since the decline in production would be less and upward pressure on prices would be dampened. In this analysis, assumptions are varied across production regions based on conclusions drawn from historical observations. For example, in the Plains, the decline in aggregate plantings is roughly one-third of the acres idled under the Flexible Fallow program. On the other hand, for every acre idled in the Corn Belt, planted area falls by approximately 0.85 acres. At the national level, the decline in plantings is roughly 60% of the reported acreage idled under the program.

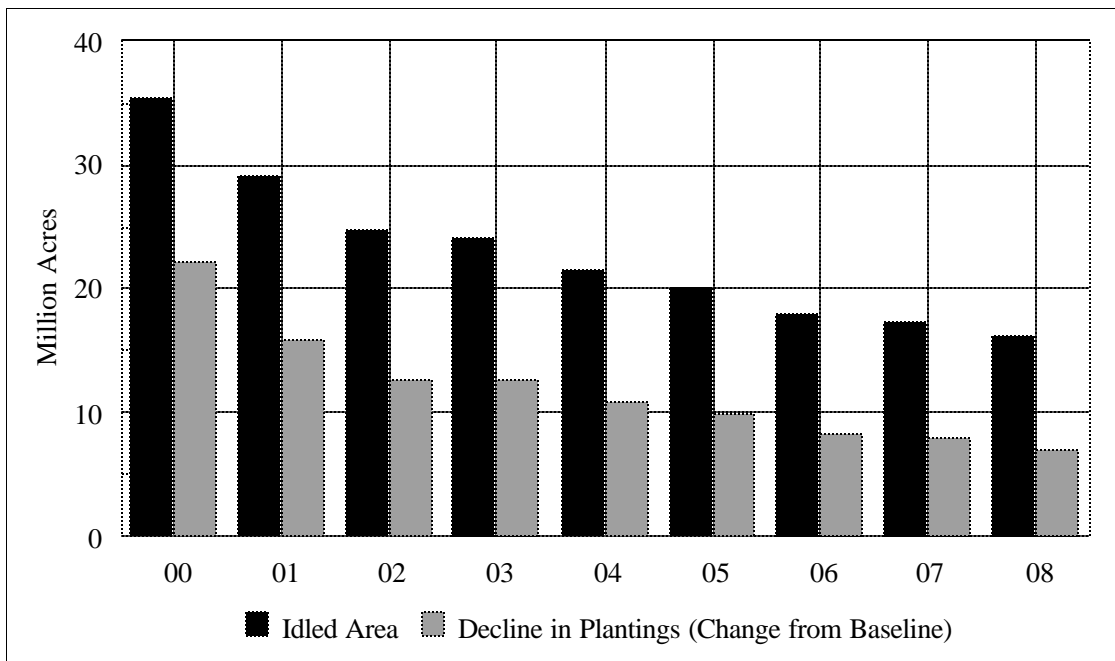


Figure 3. Idled Area and Reduced Plantings under the Flexible Fallow Program

A comparison of idled area and the decline in plantings is given in Figure 3. The numbers represent U.S. totals. In 2000, it is estimated that 35 million acres will be idled under the program with plantings declining by 22 million acres relative to the baseline. Declining participation is evident longer term with idled area of 16 million acres by 2008.

Impacts on the Crops Sector

The largest impacts on planted area occur in the early years of the analysis period. For the 2000-02 period, declines in planted area range from 6% to 10% as measured against the baseline. By the end of the analysis period, acreages of corn, wheat, and soybeans are down from baseline levels by an average of 3%. Due to the attractiveness of the program, cotton and rice show the largest declines in area. Acreage impacts by commodity for the initial three years of the analysis period and for the final three years are shown in Figure 4.

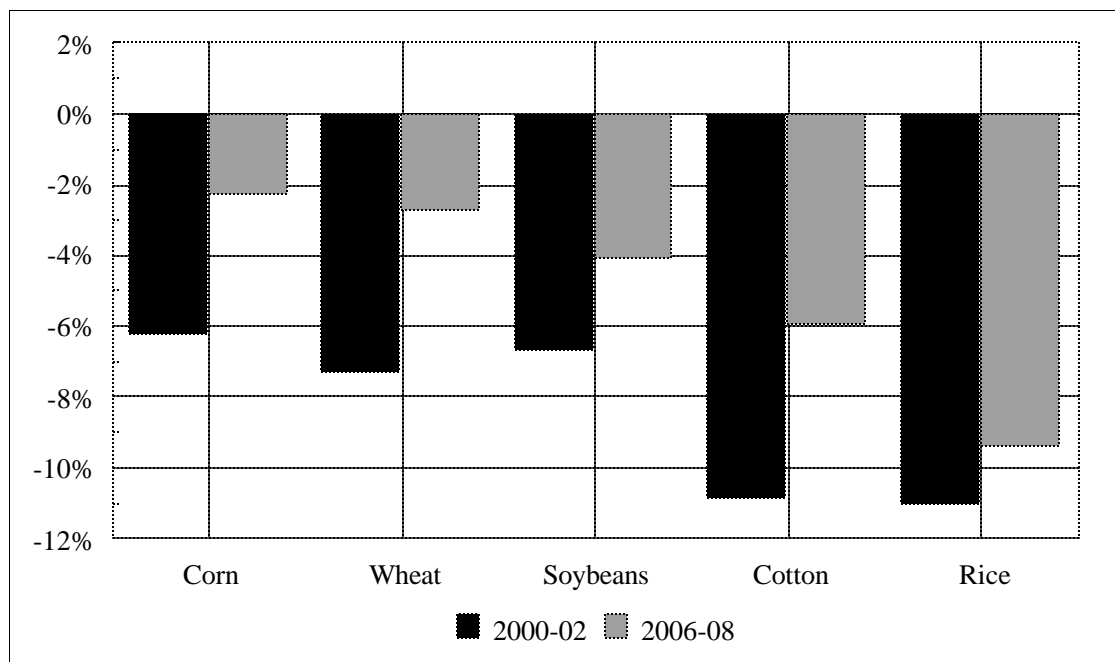


Figure 4. Planted Area, Percentage Change from Baseline

Reduced plantings translate into stronger crop prices under the Flexible Fallow scenario. The largest impacts occur in the 2000-02 period as more producers take advantage of the land idling provisions. Corn prices average approximately 20 cents per bushel higher than the baseline during the early years. Soybean prices strengthen by 40 cents in the 2000-02 period. The magnitude of price increases is much less by the end of the analysis period as fewer producers participate in the set-aside. In addition, long-run demand elasticity tends to dampen the price increase. Cotton prices show some of the largest increases due to relatively heavy participation in the program.

Lower production and higher prices lead to declines in usage of the major crops. U.S. exports have larger elasticities than domestic markets and show the largest declines in response to the higher prices. Percentage declines in volume and value of U.S. crop exports are shown in Figure 5. In 2000, the volume of exports are expected to decline by

8% relative to the baseline with the value unchanged as higher prices offset lower quantities. Longer term, both volume and value decline. Total volume declines by as much as 11% from baseline levels in 2001 and 2002, while the value falls by 3-6%. Long-term adjustments in exports reflect not only demand adjustments due to changes in livestock sectors in importing countries, but also the acreage response by competitors. Higher prices would increase competition from other exporting countries.

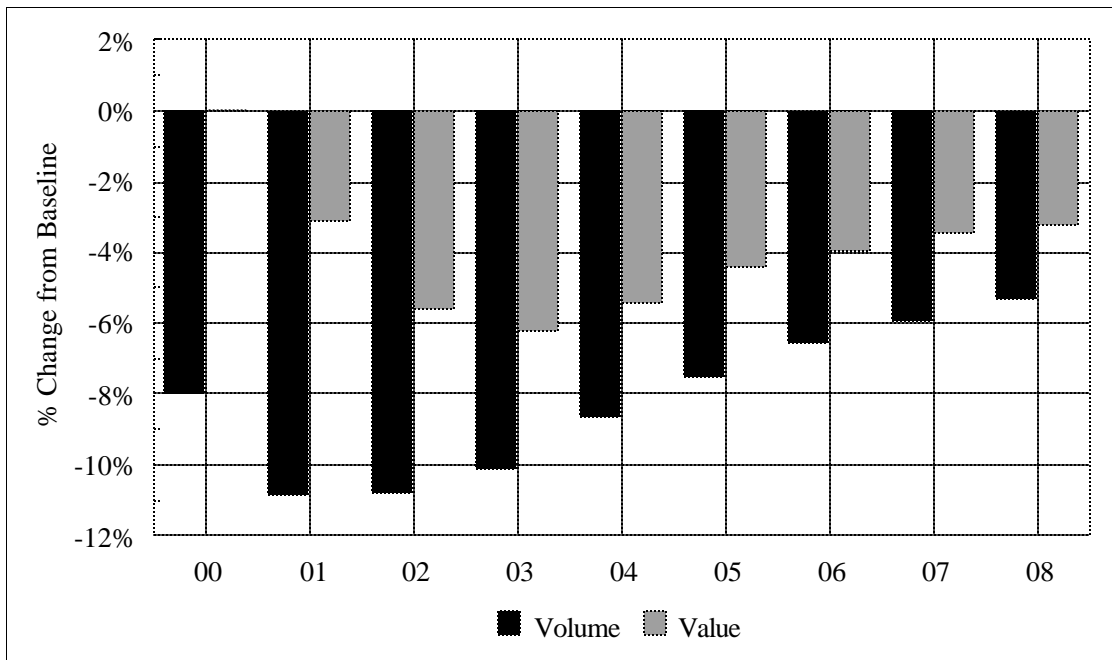


Figure 5. Export Volume and Value, Percentage Change from Baseline

Impacts on the Livestock Sector

Higher crop prices under the Flexible Fallow scenario translate into higher feed costs for the livestock sector. The livestock sector adjusts to the higher feed prices with lower production levels. Due to a heavier reliance on a corn-soybean meal ration, the pork and poultry sectors show the largest changes in production levels. However, these changes are relatively modest, with average declines of less than 1%. Livestock prices increase in response to the lower production levels. Barrow and gilt prices show the largest increases, with prices averaging \$1.10 per cwt., or 2.7%, above the baseline. The beef and poultry sectors show more modest increases in price.

Impacts on Government Outlays

Higher loan rates under the Flexible Fallow scenario result in increased government expenditures in the form of LDP's and marketing loan gains (Figure 6). Over the fiscal year 2000-08 period, annual net CCC outlays average \$2.5 billion above baseline levels. This represents a 37% increase above the projected outlays in the baseline. Corn and cotton represent the largest increases, together accounting for approximately 60% of the increase. The increase in outlays is lessened due to the higher market prices that result from fewer acres in production.

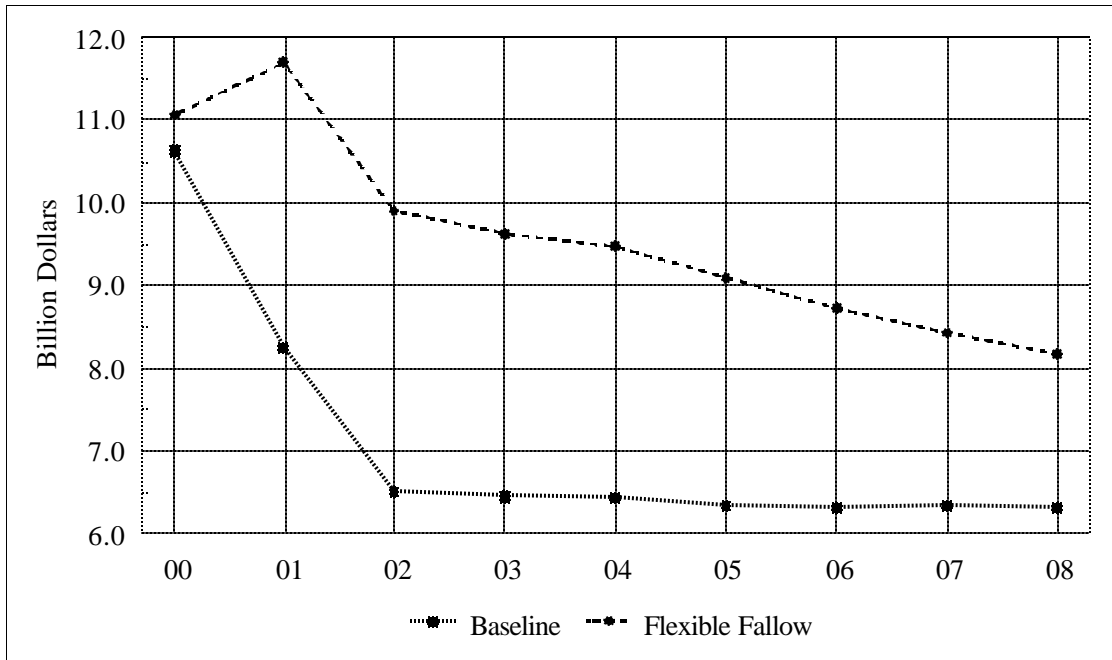


Figure 6. Net CCC Outlays

Impacts on Net Farm Income

The net income of the crops sector shows a substantial increase under the scenario due to a number of contributing factors. Market receipts are marginally higher as the market price increase averages slightly more than the decline in production. The decision to idle acres translates into a decline in overall production expenses for the crops sector. Under the scenario, expenses for seed and manufactured inputs are expected to fall by an average of \$1.2 billion from baseline levels. While this provides a positive for crop income, it would be a detriment to the inputs industry. The other boost in crop income comes from the increased government outlays. The combination of the three provides additional annual net income to the crops sector of approximately \$5.4 billion over the 2000-08 period (Figure 7).

While the program is a positive for the crops sector, net income for the livestock sector would fall under the scenario. Higher feed costs more than outweigh the increase in livestock prices, thus resulting in lower net income to the sector. For the 2000-08 period, livestock net income is projected to decline by an average of \$600 million relative to baseline levels.

For the agricultural sector as a whole, total farm income increases as the boost in crop income more than offsets the decline in the livestock sector. Over the analysis period, net farm income is projected to average \$51.7 billion under the scenario, as compared to \$46.9 billion under the baseline.

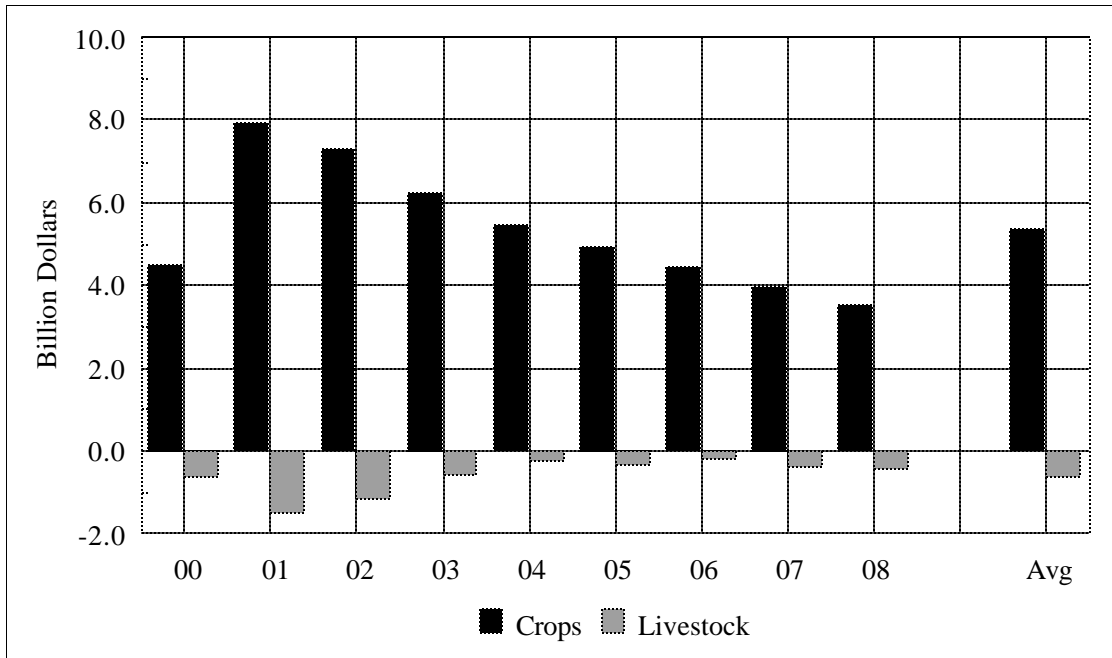


Figure 7. Change in Net Income under the Flexible Fallow Program

Impacts on the Consumer

Higher farm-gate prices translate into higher retail prices for food. As a result, consumer food expenditures under the scenario increase relative to the baseline. Over the 2000-08 period, expenditures increase by an annual average of \$1.6 billion, or \$5.74 per person. Under the FAPRI baseline, per-capita expenditures were projected to average \$2,190 per year. The higher expenditures under the scenario represent a modest increase of 0.3% of the total.

Summary

Given the short-term weakness in prices projected in the FAPRI baseline, the option of idling land in exchange for higher loan rates would be very attractive to a number of producers. Participation would lead to a noticeable decline in the planted area of the major crops and subsequently higher prices. Longer term, with stronger market prices projected, the incentive to idle land declines and the production and price impacts are dampened.

Relative to the baseline, the Flexible Fallow scenario would have very different impacts on a number of sectors. While overall farm income increases under the scenario, there are significant income transfers between the affected sectors. The crops sector would be the big winner with higher income levels due to higher prices, lower expenses, and higher government payments. U.S. exports would suffer as the volume and value of crop exports would fall relative to the baseline. Reduced plantings would also translate into less seed, fertilizer, and chemical purchases. The livestock sector would reduce production levels in response to the higher feed costs, thus leading to higher livestock prices. The consumer would eventually feel the impacts of the Flexible Fallow program as higher farm-gate prices translate into increased food prices.

APPENDIX