The Post-Commodity-Program World

Production Adjustments of Major U.S. Field Crops

by Carl Zulauf and Luther Tweeten

Whatever its particulars, the new farm bill will continue the evolution toward greater reliance on the market. This article examines the consequences of this trend for the seven field crops which received deficiency payments for the 1991-95 crops: barley, corn, cotton, oats, rice, sorghum, and wheat. These crops accounted for a majority of farm program expenditures and harvested acreage in the U.S.

In a world without government farm programs, producers would make production decisions based upon market prices. Insights into producer decisions in a no-program world can be obtained by examining how producers responded to the flex acreage provision enacted in 1990. This provision reduced the number of program base acres on which a farmer received deficiency payments by 15 percent. Any crop could be planted on these so-called normal flex acres except fruits, vegetables, and other crops designated by the secretary of agriculture. Crops grown on flex acres were eligible for price-support and/or marketing loan prices, but these support prices were 30 percent or more below the target prices which determined deficiency payments. Thus, by examining farmers' response to flex acres, insights can be gained into the incremental changes in the production of crops which will occur in a more market-oriented agriculture without deficiency payments and acreage reduction programs, and with support prices near or below free-market equilibrium prices.

Data

We analyze producer decisions regarding normal flex acres (NFA) during crop years 1992, 1993, and 1994. The analysis focuses on (*i*) the share of a state's total NFA for all seven crops that was idled and (*ii*) the share of a state's NFA for each crop planted back to the same crop (for example, corn NFA planted to corn). The idling of NFA indicates that without deficiency payments it was not profitable to plant any crop on the land, not just the farm program crop. Thus, the share of NFA idled provides insights into where and by how much the production of crops may decline as government supports are reduced. In interpreting this ratio, it is important to remember that fruits and vegetables could not be planted on NFA. This restriction probably increases the share of NFA idled, particularly in those areas where high value fruits and vegetables are the only crops which can generate a profit given the cost of irrigation.

Share of NFA planted back to the same crop measures the willingness of the state's farmers to produce the crop even in the absence of deficiency payments. The higher the share of NFA planted back ro the same crop, the greater the state's competitiveness in a freer market in producing the particular program crop relative to other crops.

Share of normal flex acres idled

Figure 1 presents the share of a state's total NFA that was idled. Considerable variation exists, ranging from 1.9 percent for Illinois to 69.5 percent for Nevada. Several distinct regional patterns emerge. First, states along the Ohio and Mississippi rivers, as well as the middle Atlantic states, idled the smallest share of NFA. Farmers idled less than 10 percent of NFA in these states. On the other hand, farmers idled the largest share of NFA in the northeast, mountain, Pacific, and southern plains states, plus West Virginia and Florida. In most of these states farmers idled more than one-third of NFA. The southeast, northern plains, and lake states fell between these two groups.

Share of NFA idled for the seven individual crops generally follows the same regional patterns depicted in figure 1. For example, the share of corn NFA idled was smallest in the states which bordered the

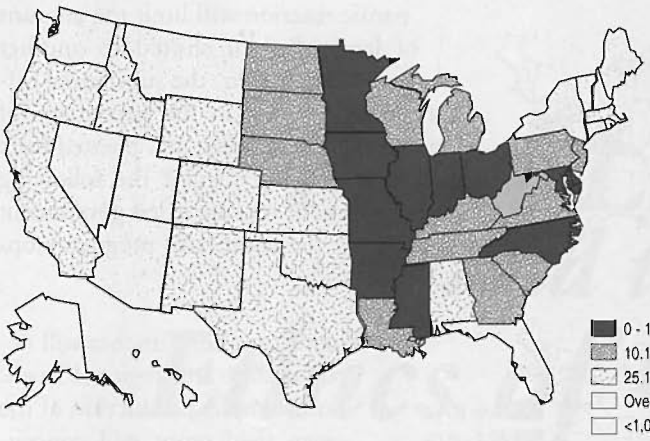

Figure 1. Share of normal flex acres idled, all program crops, U.S., 1992-94

Ohio and Mississippi rivers and largest in the northeast, mountain, Pacific, and southern plains states, plus West Virginia, Florida, Alabama, and Georgia. The similarity among the individual crops in share of NFA idled is not surprising. The share idled is partly a function of the inherent productivity of the land and availability of low-cost water, particularly through natural rainfall. These two factors correlate with geographic area.

Share of normal flex acres planted back to the same crop

The share of normal flex acres planted back to the same crop breaks into two distinct groups. For the United States, 69, 55, and 50 percent of cotton, corn, and wheat NFA, respectively, were planted back to the same crop. In contrast, for sorghum, rice, barley, and oats the average shares were 32, 30, 24, and 17 percent, respectively. These ratios suggest that the production of cotton, corn, and wheat will be affected less by the movement to free markets than will the production of the other four crops.

The larger percentage for cotton may reflect the relative change in the loan support rates since the early 1980s. Compared with the average loan rate for the 1982–84 crops, the average loan rate for the 1992–94 crops was 35 percent lower for rice, 31 percent lower for the feed grains and wheat, but only 18 percent lower for cotton. Crops planted on NFA are eligible for price support or marketing loans. The smaller decline in the cotton loan rate means that government support for cotton produced on NFA has declined less than government support for the other program crops produced on NFA. This distortion, which would not exist in a world with no programs, most likely makes cotton a relatively more attractive crop. Thus, our NFA analysis probably overstates the competitiveness of cotton relative to the other program crops.

Turning to the individual crops, different stories emerge for each one. For corn, states which currently produce the most corn have the highest share of corn NFA planted back to corn (figure 2). For example, 62 percent of corn NFA in the five largest corn-producing states (Iowa, Illinois, Nebraska, Minnesota, and Indiana) was planted back to corn. In contrast, the twenty smallest corn-producing states planted only 26 percent of corn NFA back to corn. These results imply that corn production will further concentrate in the largest states as government supports decline.

For wheat, the share of NFA planted back to the crop increases the further north the state (figure 2). To illustrate, for states on the southern U.S. border, 32 percent of wheat NFA was planted back to wheat. For states on the northern U.S. border, 60 percent of wheat NFA was planted back to wheat. Furthermore, for states on the southern U.S. border, 43 percent of wheat NFA was idled. For states on the northern U.S. border, 21 percent of wheat NFA was idled. These comparisons suggest that wheat production will tend to move north as a more free market emerges.

A west-to-east pattern emerges for cotton (figure 2). In Arizona, California, and New Mexico, 48 percent of cotton NFA was planted back to cotton

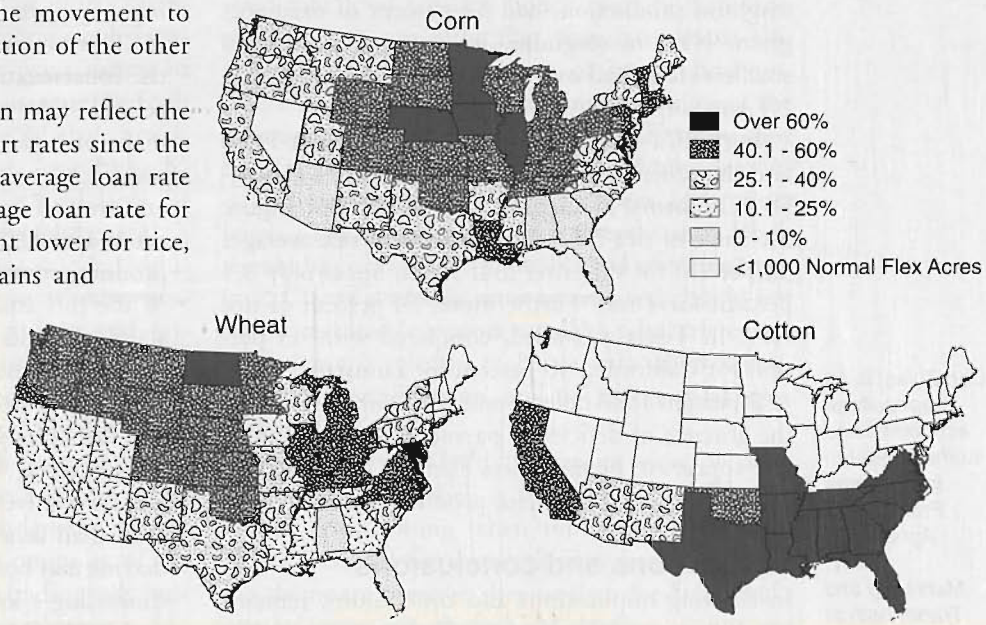

Figure 2. Percentage of corn, wheat, and cotton normal flex acres planted back to the same crop, U.S., 1992-94

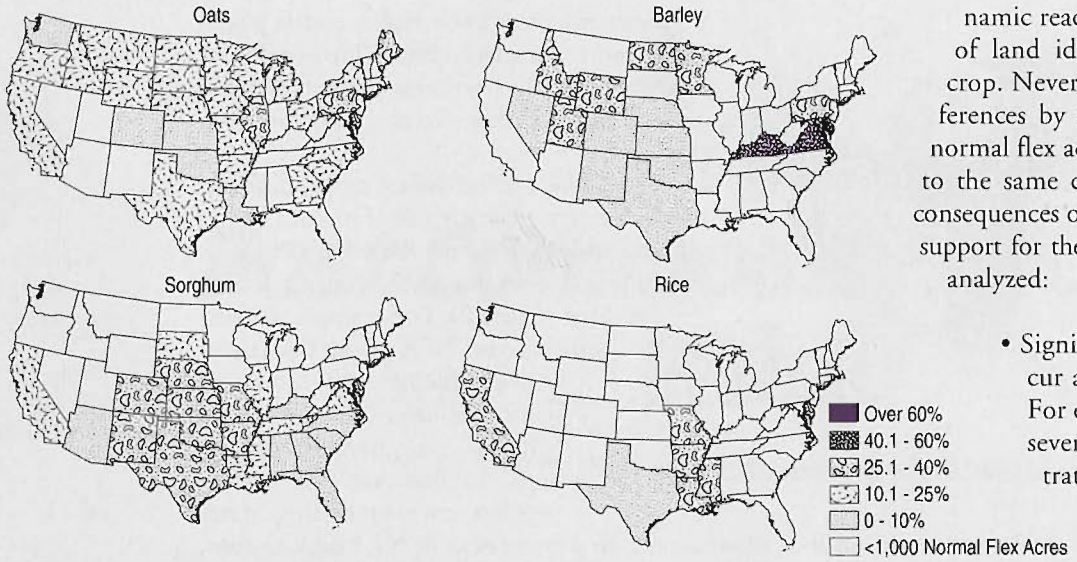

Figure 3. Percentage of oats, barley, sorghum, and rice normal flex acres planted back to the same crop, U.S., 1992-94

while 28 percent of cotton NFA was idled. In the old Cotton Belt states of Alabama, Arkansas, Georgia, Florida, Louisiana, Missouri, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia, 79 percent of cotton NFA was planted back to cotton while 8 percent of cotton NFA was idled.

Only three states have more than 25 percent of oats NFA planted back to oats: Maine, Illinois, and Pennsylvania (figure 3). These states account for less than 2 percent of base acres in oats. Barley exhibits no definitive patterns, but the share of barley NFA planted back to barley tends to be highest in the middle Atlantic states and to increase the further north the state (figure 3). Sorghum exhibits the same pattern as corn (figure 3). Texas, Kansas, and Nebraska, which account for three-quarters of sorghum production, had 34 percent of their sorghum NFA in sorghum. In contrast, the fifteen smallest states had only 9 percent of their sorghum NFA in sorghum.

For rice, a striking difference exists between Texas and the other four largest producing states: Arkansas, California, Louisiana, and Mississippi (figure 3). Share of rice NFA planted back to rice averages 34 percent for the latter four states, but is only 3.5 percent for Texas. Furthermore, 74 percent of rice NFA in Texas was idled, compared with 43 percent for California, 30 percent for Louisiana, and 1 to 2 percent for Arkansas and Mississippi. Thus, in the absence of deficiency payments, production of rice appears to be much less likely in Texas than in the other current large rice production states.

Implications and conclusions

In deriving implications and conclusions, remember that prices will adjust to supply changes resulting from idling or shifting production. This dynamic reaction will limit the amount of land idled or shifted to another crop. Nevertheless, the substantial differences by state in the percentage of normal flex acres idled and planted back to the same crop suggest the following consequences of moving to less government support for the seven farm program crops analyzed:

- Significant adjustments will occur at state and regional levels. For example, production of the seven field crops will concentrate in states along the Mississippi and Ohio rivers, or in the South in the case of cotton. Field crop production will contract in the southern plains, mountain, Pacific, and northeastern states.
- Some cropland, especially in more marginal regions, will shift to grazing. Other cropland will shift to trees. These uses will be consistent with comparative advantage in land use. Little land will lie idle, although some currently marginal grazing land may return to its natural state.
- As production of corn, wheat, oats, barley, and sorghum concentrates in fewer states, they will move toward joining cotton and rice as regional crops.
- The concentration of feed grain production in the central states is opposite the current move to the south and west of beef, dairy, and hog production. These divergent trends suggest that, if the two trends continue, the efficiency of the U.S. transportation sector will become increasingly important to the efficiency of U.S. livestock production. A second interpretation is that the concentration of feed grain production in the central states may act as a brake on the movement of beef, dairy, and hog production to the south and west, or that the move to the south and west of beef, dairy, and hog production will act as a brake on the concentration of feed grain production in the central states.
- While this analysis is most applicable to understanding regional changes in U.S. agriculture as farm programs decline, the low percentage for the U.S. of oats, barley, sorghum, and rice normal flex acres planted back to the same crop suggests that, as freer markets emerge, these crops will be relatively less profitable to produce in the U.S. than other crops. Thus, U.S. feed grain production may become even more concentrated in corn, continuing a long-run trend which has seen corn's share of U.S. feed grain production grow from 72 percent in 1960–64 to 88 percent in 1990–94.

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