

Supply Response Under the 1996 Farm Act and Implications for the U.S. Field Crops Sector. By William Lin, Paul C. Westcott, Robert Skinner, Scott Sanford, and Daniel G. De La Torre Ugarte. Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture. Technical Bulletin No. 1888.

Abstract

The 1996 Farm Act gives farmers almost complete planting flexibility, allowing producers to respond to price changes to a greater extent than they had under previous legislation. This study measures supply responsiveness for major field crops to changes in their own prices and in prices for competing crops and indicates significant increases in responsiveness. Relative to 1986-90, the percentage increases in the responsiveness of U.S. plantings of major field crops to a 1-percent change in their own prices are wheat (1.2 percent), corn (41.6 percent), soybeans (13.5 percent), and cotton (7.9 percent). In percentage terms, the increases in the responsiveness generally become greater with respect to competing crops' price changes. The 1996 legislation has the least effect on U.S. wheat acreage, whereas the law may lead to an average increase of 2 million acres during 1996-2005 in soybean acreage, a decline of 1-2 million acres in corn acreage, and an increase of 0.7 million acres in cotton acreage. Overall, the effect of the farm legislation on regional production patterns of major field crops appears to be modest. Corn acreage expansion in the Central and Northern Plains, a long-term trend in this important wheat production region, will slow under the 1996 legislation, while soybean acreage expansion in this region will accelerate. The authors used the Policy Analysis System-Economic Research Service (POLYSYS-ERS) model that was jointly developed by USDA's Economic Research Service and the University of Tennessee's Agricultural Policy Analysis Center to estimate the effects of the 1996 legislation.

Keywords: Supply response, major field crops, acreage price elasticities, normal flex acreage (NFA), 1996 farm legislation.

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Contents

Summary	iii
Introduction	1
Evolution of Supply Management Programs Toward	
Planting Flexibility	3
Supply Management Policy Evolution to Market Orientation	3
A Closer Look at 1990 Farm Legislation	3
Implications for Supply Response Estimation	6
Previous and Current Related Research	8
Analytical Framework for Modeling Acreage Response	9
Supply Response Estimates on NFA	10
Supply Response Estimates: Model I	10
Supply Response Estimates: Model II	14
Acreage Price Elasticities	17
Estimating Acreage Price Elasticities	17
Elasticity Results	19
Impact of the 1996 Act on the U.S. Major Field Crops Sector	25
POLYSYS Simulation Procedures	25
Simulation Results	26
Validation of Acreage Price Elasticities and Simulation Results	36
Comparisons Between Model Acreage Forecasts and March	
Planting Intentions, 1997-99	36
Comparisons of the POLYSYS Simulation Results Between	
“High-Price” and “Low-Price” Scenarios, 1997-98	40
Conclusions	42
References	43
Appendix Tables	45

Summary

Supply response for crops has historically been heavily influenced by the effects of agricultural commodity programs. Structural relations estimated under the previous policy environment, however, may no longer hold under the Federal Agriculture Improvement and Reform Act of 1996 (1996 Act) because most of the restrictions imposed on producers' planting decisions are now removed. A central question resulting from this policy change is how responsive plantings are to movement in market prices under the 1996 Act compared with previous legislation.

This technical bulletin estimates producers' supply response under the 1996 Act for major field crops by production region. The study also measures the effect of planting flexibility under the 1996 Act on aggregate acreage planted to major field crops, crop acreage composition, farm prices, and regional production adjustments. The general approach taken is an indepth analysis of producers' planting decisions during 1991-95, when producers were granted limited planting flexibility under the Food, Agriculture, Conservation, and Trade Act of 1990 (1990 Act), and then to infer their likely acreage response to market incentives under the 1996 Act.

Own- and cross-price acreage elasticities for major U.S. field crops are greater (producers' planting decisions are more responsive to price changes), in most cases, under the 1996 Act than those estimated under previous legislation due to almost full planting flexibility. Relative to 1986-90, the own-price acreage elasticity under the 1996 Act shows an increase in the responsiveness of U.S. wheat producers to a change in the wheat price by 1.2 percent. For other commodities, the percentage increases are as follows: corn (41.6%), soybeans (13.5%), and cotton (7.9%). In percentage terms, cross-price acreage elasticities estimated under the 1996 Act generally increase even more than own-price elasticities. This finding implies that farm commodity programs in the past might have restricted acreage shifts from program crops to other crops.

The increases in own- and cross-price elasticities tend to have offsetting effects on acreage changes in total. As a consequence, results in this study indicate that the aggregate effect of the 1996 Act on area planted to the eight major field crops (wheat, corn, sorghum, barley, oats, soybeans, cotton, and rice) is modest when compared with plantings under a continuation of the 1990 Act. The 1996 Act has the least effect on U.S. wheat acreage, in part due to small changes in acreage price elasticities between the 1990 Act and 1996 Act. Corn acreage expansion in the Central and Northern Plains, a long-term trend in this important wheat production region, will slow under the 1996 Act, while soybean acreage expansion in this region will accelerate. The 1996 Act has its biggest acreage effect on soybeans—an increase of over 2 million acres throughout the entire 1996-2005 period. Nearly full planting flexibility allows corn producers to make a switch from corn to soybeans.

Overall, the effect of the farm legislation change on regional production patterns of major field crops also appears to be modest. The effect varies among crops, ranging from the smallest for wheat to a more noticeable change for cotton. Corn production will be slightly more concentrated in the North Central region

under the 1996 Act, while soybean production will be slightly less concentrated in that region, due to projected acreage expansion in other regions.

The effects of the greater degree of producer responsiveness related to the 1996 farm legislation on crop acreage and regional production patterns were initially estimated under the high-price market conditions of 1996 and 1997. This study found that the effects of the greater degree of producer responsiveness would have been much the same under lower price market conditions as occurred in recent years, as well.