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CROP SYSTEM DIVERSITY: HISTORICAL PERSPECTIVE AND CURRENT POLICIES



by

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The 1996 Federal Farm Bill represented a significant shift in the primary policy mechanism for supporting farm incomes. Crop-specific "deficiency payments" were replaced by "production flexibility contract payments" which are scheduled to continue through the year 2002 and, presumably, then terminate. The annual payments each contract farm receives will vary somewhat from year to year, but they are allocated on the basis of each farm's historical base acreage and yields, not on the basis of current acreage planted to particular crops. Thus, farmers have almost unlimited planting flexibility under the present farm bill.

Will this flexibility result in more crop system diversity over time? The answer will depend on many factors and is likely to differ in various parts of the country. A recent Farm Foundation newsletter ("Managing Farm Resources in the Era of the 1996 Farm Act", **Special Supplement to The Catalyst**, August 1997) reported opinions of eight panels of farm managers and farm operators across the country about crop production changes that might result from the new farm bill. The most frequently identified types of long-term management changes were: (a) more attention to marketing and risk management (31 percent of panelists); and (b) greater adjustment of acreage among

¹We appreciate assistance with data and figures provided by Lisa Carr.

crops (25 percent). In fact, decisions about management of risk and what crops to grow are likely to be very much intertwined.

None of the eight panel sessions were held in South Dakota, though one was convened in North Dakota. The SDSU Economics Department will be conducting panel or focus group sessions with farm operators in two counties of eastern South Dakota--Moody and Codington--this fall to gain insights about possible long-term crop system and risk management adjustments in this area of the U.S. that straddles the Western Corn Belt and Northern Great Plains. However, to envision possible future events, we must first have some understanding of the past. Therefore, some historical perspective on eastern South Dakota is in order.

Last half of the twentieth century in seven eastern South Dakota counties

Changes in acreage of six major crops in seven eastern South Dakota counties (Minnehaha, Moody, Lake, Brookings, Deuel, Hamlin, and Codington) between Sioux Falls and Watertown are shown in Figure 1.² Five-year averages were used, to make trends more clear. Clearly, corn was the major crop in this region throughout much of the 45-year period running from 1950 to 1995. Oats went from a major crop, with more acreage even than corn in the early 1950s, to a minor crop by the 1990s. Flax acreage also declined to negligible levels by the end of the period. The most dramatic increase was in soybean acreage, especially from the late 1970s onward. Wheat acreage increased some in the 1970s, and remained at higher levels than in the first half of the period examined. Hay acreage declined by over 40 percent between 1959 and 1992 (Figure 2).

²Data for all of the figures except Figure 2 came from the S.D. Agricultural Statistics Service. Figure 2 data came from the Agricultural Census.

We normally use market prices to help explain changes in economic behavior. Prices of major crops in South Dakota are shown in Figure 3. (The crop prices shown have been deflated by an index of prices paid by farmers, to adjust for inflation in input costs.) We see that soybean prices first rose in "real" (deflated) terms for a time in the late-1950s and 1960s, apparently providing incentive for farmers to temporarily expand soybean acreage in the 1960s. However, price movements shown for the other crops are not very helpful in explaining long-term changes in the mix of crops planted. Most prices trended downward, except for a period during the 1970s when agricultural exports were extremely strong. Other factors, such as technology and farm policy, also must have played a role in influencing the mix of crops grown. For example, although U.S. agriculture's annual productivity growth rate averaged 1.8 percent between the late 1940s and the early 1990s, rates differed over time and among crops. The differences among crops in yield growth rates influenced the relative profitability, over time, of different crops.

A closer look at two counties in different agro-climatic areas

In attempting to understand changes in crop mixes that have taken place, it is helpful to look at different agro-climatic areas within eastern South Dakota. Figure 4 shows the evolution over time of crop mixes in Moody County, toward the southern end of the seven-county region, and Figure 5 shows the evolution in Codrington County, at the northern end.

Corn was a major crop in the 1950s in Moody County, and remained so in the 1990s (Figure 4). Oats also was a major crop at mid-century, but it declined from 45 percent of crop (excluding hay) acreage in 1954 to only 2 percent in 1992. The other major change, of course, was in soybean

Figure 1

Major Crops:
Eastern South Dakota

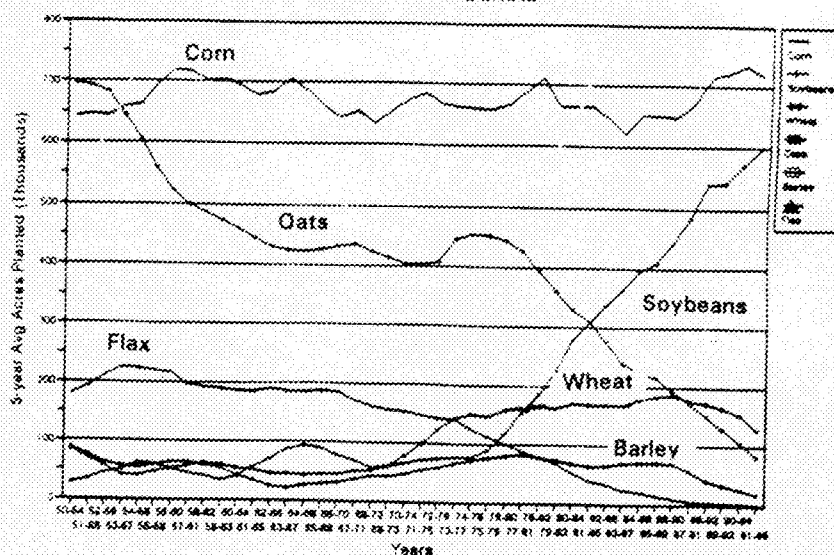


Figure 2

All Hay Acres:
Eastern South Dakota

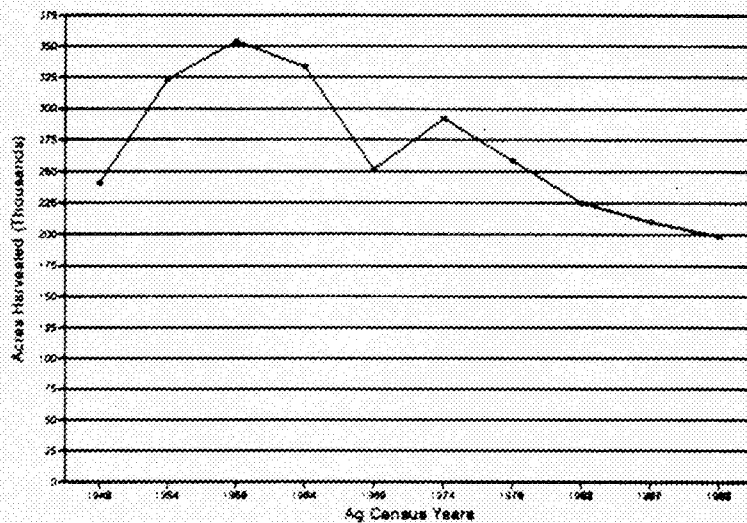


Figure 3

Commodity Prices:
South Dakota

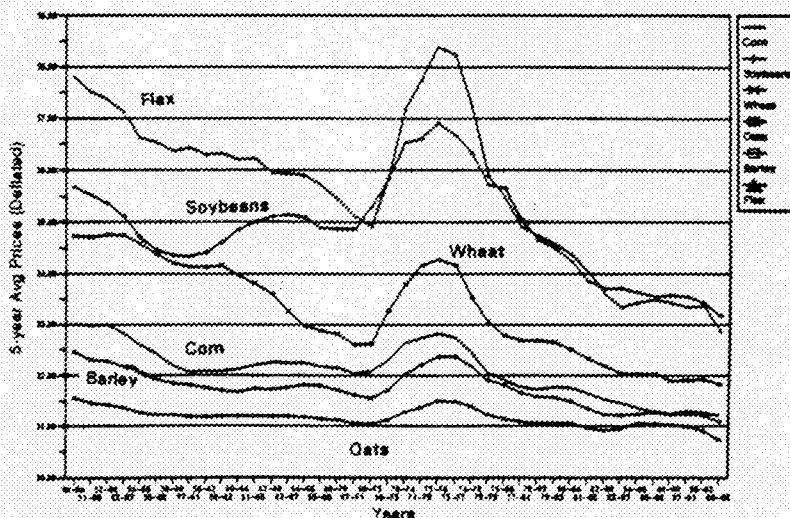


Figure 4

MOODY COUNTY

Acres Planted

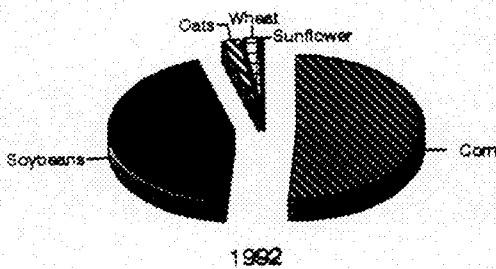
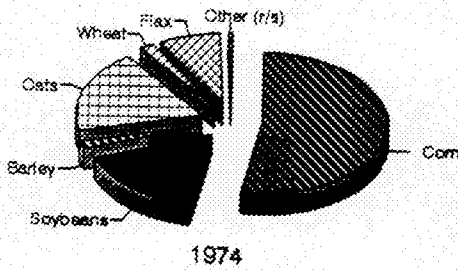
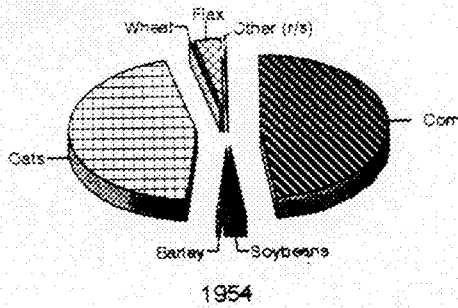
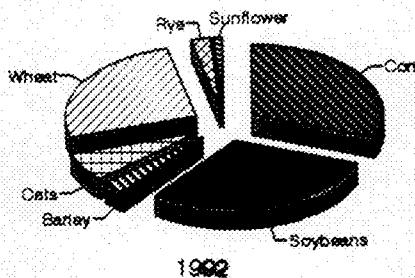
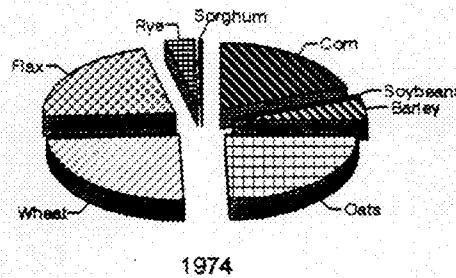
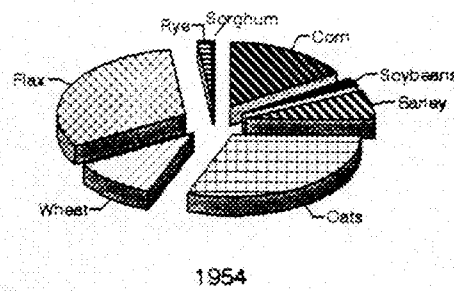


Figure 5

CODINGTON COUNTY

Acres Planted



acres, which went from 3 percent in 1954 to 16 percent in 1974 and 44 percent in 1992. By the 1990s, Moody County's agriculture had evolved to basically a corn-soybean system. It had become a part of the vast U.S. Corn Belt lying to its east and south. A little small grain acreage--mainly oats and wheat--remained, but flax had disappeared.

Codington County has a shorter growing season than does Moody County. Consequently, small grains historically have been relatively more important in Codington County (Figure 5). However, the single most important crop in 1954 was flax (31.5 percent of crop acreage, excluding hay), followed closely by oats (30 percent). Wheat made up only 11 percent of Codington County's crop acreage in 1954, but it increasingly replaced other small grain crops and made up 25 percent of planted acreage by 1974 and 26 percent in 1992. Corn also gradually took on greater importance in Codington County, going from 16 percent of the acreage in 1954 to 20 percent in 1974 and 31 percent in 1992. The really dramatic changes in Codington County, though, were in soybeans and flax, which essentially reversed each other in importance. Soybeans made some inroads in Codington County in the 1950s and then faded out, before taking off in the late 1970s. By 1992, soybeans made

up nearly 30 percent of the county's crop acreage, almost that of flax in 1954. Flax had largely disappeared. Thus, three crops--corn, soybeans, and wheat--made up more than 85 percent of the acreage by the early 1990s.

The roles of agricultural policy and technology in contributing to the crop mix changes in Moody and Codington Counties over the past half century are currently being examined in a Master's thesis by Linda Dumke.

A look ahead

Evidence is still too preliminary to draw conclusions about likely long-term effects of the 1996 Farm Bill on crop system diversity. Thus far, the major shifts nationwide appear to have resulted in more corn and, especially, soybean acreage. There no longer are any annual acreage set-aside requirements for farmers to qualify for support payments. Partially as a consequence of this, and the new planting flexibility, planted corn acreage in 1996 was the highest since 1985, soybean acreage was the highest since 1984, and spring wheat acreage was the highest since 1936. Planted acres of corn were slightly higher in 1997 than in 1996, but soybean acres were 10 percent higher. Both spring and winter wheat planted acres were lower in 1997 than in 1996.

These preliminary indications suggest that corn-soybean rotations will replace some of the remaining continuous corn systems and more soybeans may be planted in rotation with wheat. Beyond that, there is little evidence thus far of increased crop system diversity. Movement toward greater crop system diversity, if indeed it does occur, is likely to take more time due to interrelated management decisions involving a host of factors--including marketing, investing in machinery, controlling crop diseases and pest problems, and utilization of such risk management tools as Multiple Peril Crop Insurance (MPCI) and Crop Revenue Coverage (CRC).

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