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## Statewide Results of a Study of Sustainable Agriculture in South Dakota; Hog Comments

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# ECONOMICS COMMENTATOR



SOUTH DAKOTA STATE UNIVERSITY  
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## Statewide Results of a Study of Sustainable Agriculture in South Dakota



by  
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This issue of the Commentator contains excerpts from the recently released summary of a study of sustainable agriculture in South Dakota. The summary was published as SDSU Agricultural Experiment Station Bulletin 713--Farm, Rural Economy, and Policy Implications of Sustainable Agriculture in South Dakota. Single copies are available at no charge at County Extension Offices in South Dakota or by sending a mailing label and \$0.98 in postage to: Bulletin Room, Lincoln Music Hall, South Dakota State University, Brookings, SD 57007.

### Sustainable Agriculture Research at SDSU

South Dakota State University (SDSU) has been conducting research since the mid-1980s on what has come to be called sustainable agriculture. We have been examining farming systems in which producers adopt management-intensive, holistic system orientations in planning their farms. In practice, such sustainable producers use crop rotations and other natural soil-building and cultural practices to partially or completely replace synthetic chemicals (e.g., fertilizers, pesticides). They substitute on-farm produced resources for externally produced, purchased inputs.

In response to grass-roots initiatives from farmers, SDSU began research on sustainable agriculture in 1984. Initial work of plant scientists involved monitoring "conventional" and "sustainable" farmers' fields in the east-central part of the state. Production practices, soil fertility, yields, pest populations, and other agronomic parameters were measured.  
(Continued on page 2)

## Hog Comments



by  
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Extension Livestock  
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The following article also appears in the June issues of "Porkline", distributed by the South Dakota Pork Producers Association.

Some of you may have read an article titled "Pork Industry's Numbers Shrink As It Heads to Maturity" in the April 15th edition of Feedstuffs. If you didn't, it may be worth your time to do so. Some of the comments in the article are worth further discussion.

First, the article includes a statement that by the year 2000 the U.S. will need only 50% of the sows currently in the inventory to supply our pork needs. The statement is based upon assumptions of a stable per capita consumption of 64 pounds (a reasonable assumption), 19 pigs per sow per year (also reasonable) and a 290 pound average slaughter weight (maybe a little high but not impossible).

Second, the article includes considerable discussion regarding the growth in numbers and market share of the ultra-large corporate farms and the decline in numbers and market share of the small-scale producers. It was noted that National Farms has plans for a 20,000 sow unit in Texas, not a typical hot-spot for hog production. Also, Tyson Farms is adding 30,000 sows in Oklahoma to the 30,000 it already has in Arkansas. Other large-scale operations already are in production or are planned for California, Mississippi and North Carolina.

Finally, the article includes some discussion of vertical integration, and the use of standardization and the use of  
(Continued on page 3)

Intensive monitoring has continued on one of the conventional farms and on one of the sustainable farms. Agricultural economists have joined plant scientists in data collection and analysis.

SDSU's sustainable agriculture research was incorporated into agronomy trials at the Northeast Research Station near Watertown, starting in 1985. Long-term trials, still underway, compare various combinations of crop rotations and cultural practices. Conventional, reduced tillage, and alternative or sustainable farming systems are being studied. See previous Commentator issues 270 and 298 for some of the economic results, as these are not reported in Bulletin 713 or this article.

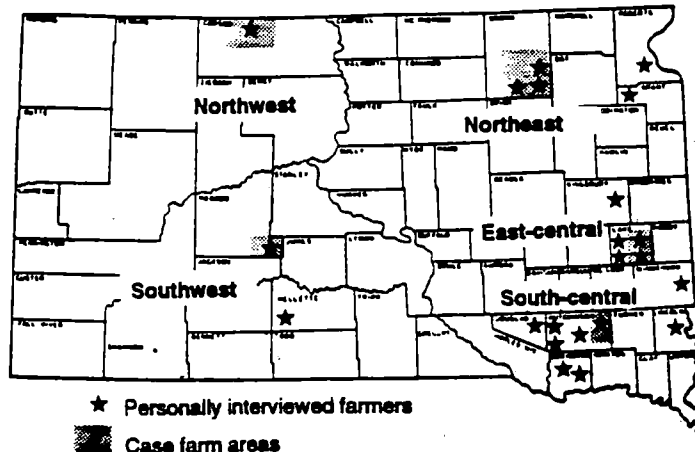
The sustainable agriculture research program expanded in 1988 to include a broader perspective on sustainable farming practices across the state. A mail survey of "sustainable" farmers in South Dakota was conducted that year, and 32 usable responses were returned. A grant received in late 1988 from the Northwest Area Foundation (NWAFF), in St. Paul, Minn., helped fund expanded research work with farmers--initially through follow-up, on-farm interviews with 22 of the sustainable farmers who responded to the mail survey.

Locations of the 22 farms on which personal interviews were conducted are shown in Figure 1. Detailed economic analyses of the crop systems were conducted for 12 of the 22 farms, and economic analyses of the livestock systems also were conducted for the nine of those 12 farms which have livestock.

For purposes of policy and rural economy analyses, five of the 22 farms were used as case studies. The five farms represent sustainable systems in different agro-climatic areas within South Dakota: south-central, east-central, northeast, northwest, and southwest (see Figure 1). These five "sustainable" farms were compared with five "conventional" farms, one of which is an actual operating farm (in the east-central area) and four of which are "synthetic." The east-central actual operating conventional and sustainable case farms are the ones noted previously for which SDSU has been collecting data since the mid-1980s. Data for the "synthetic" (or hypothetical)

conventional farms came from a variety of sources, including: the Agricultural Census, Cooperative Extension and Soil Conservation Service reports, and interviews with knowledgeable individuals.

Fig 1. Locations, by region, of the 22 personally interviewed sustainable farmers and of case farm areas.



In the final stages of the NWAFF-supported study, panels of sustainable and conventional farmers, Extension agents, and other agriculturalists were interviewed in each of the five agro-climatic areas. The panel interviews focused on perceived differences between "sustainable" and "conventional" farming systems and on farmers' reasons for using different types of systems.

### Conclusions

Sustainable agriculture takes on different agronomic dimensions in different agro-climatic areas. For example, differences between sustainable and conventional farmers in application rates of synthetic chemical fertilizers tend to be much greater in the eastern corn-soybean areas of South Dakota than in the northeastern and western wheat areas. Consequently, economic differences between sustainable and conventional farmers also vary by agro-climatic area.

In the corn-soybean areas, when organic premiums are absent, sustainable farms are less profitable than conventional farms. However, there appears to be less difference in profitability between the two types of farms in the wheat areas. In fact, when organic premiums for those farms that qualify are factored in, sustainable farms in the wheat areas appear to be slightly more

profitable than their conventional counterparts.

Higher energy prices and federal farm policies which permit greater planting flexibility without sacrifice of support payments would enhance the relative profitability of sustainable systems. In wheat areas, such changes in the years ahead could often tip the balance, making sustainable systems more profitable even without organic premiums. More dramatic changes in prices or federal farm programs--or in a combination of those factors and in environmental policies--would be required for sustainable systems to generally be more profitable than conventional systems in corn-soybean areas.

Although the implications of a number of policy options were clarified in this study, further research is needed to design policy sets which incorporate combinations of federal farm commodity program policy and environmental policy.

Rapid widespread conversion from conventional to sustainable farming systems could cause some economic adjustment difficulties for rural communities. However, most economic conversions take place gradually. Hence, some adverse effects would likely be mitigated. Moreover, there could be a number of positive long-term effects on rural communities from conversions to sustainable systems. However, these effects are difficult to quantify in advance. If systems can be developed which enhance the long-run economic and environmental sustainability of moderate-sized family farms, then the economic health of rural communities also may be enhanced.

This study identified some key differences at the present time between "sustainable" and "conventional" farming systems in South Dakota. It also provided some tentative ideas about the relative economic attractiveness to farmers of selected systems, given current and possible alternative farm and environmental policies.

Much of the analysis was based upon case studies. Case studies are extremely valuable in providing specific, detailed insights. However, caution must always be

used in generalizing from such studies. A great deal of judgment is required in selection of cases for study, and whatever cases are selected will not be representative of all systems or situations in a given agro-climatic area. Consequently, profitability comparisons should be considered indicative, not definitive.

Moreover, technologies and systems for a more sustainable agriculture are very fluid at the present time. With much of the research on sustainable agriculture having begun since the mid-1980s, and with many farmers now themselves experimenting with more "sustainable" practices and systems, new insights are rapidly emerging. As research and farmer experimentation bear fruit, farming systems thought by some to be best today may be replaced by other farming systems a few years from now.

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(Continued from page 1 ... Murra)

brand names. Some of the ultra-large corporations, such as Tyson and Smithfield, will be in production, processing, wholesaling and maybe even retailing.

What does all of the above mean to the typical, small-scale pork producer found in the Midwest? First, the industry will continue to move closer to the type of structure found in the poultry sector. More processing and increased emphasis on brand names will be seen. That likely will result in increased per capita pork consumption in the U.S. but also will increase the emphasis on uniformity. A standard weight, fat thickness and other meat qualities will be stressed. Producers who don't meet those standards likely will find it difficult to find markets.

Second, the changes in total output and price from year to year and even within a year will be less drastic. Fairly level year-round production, rather than a Fall and Spring pig crop, will be the rule. Large-scale output usually means continuous production, especially when tied to the processing and wholesale ends of the business. Also, large-scale output often means lower variable costs, even though fixed costs are higher. Since a firm will produce if price is high



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enough to cover variable costs, prices can go very low before production is reduced.

The net result of the above, if it does indeed occur, is that small-scale producers must emphasize efficiency, uniformity, quality and marketing to compete. The industry in the year 2000 probably will be much different than the industry today. Largeness, brand names, vertical integration, horizontal integration (maybe through contracting) and standardization will be the keywords in the late 1990's.

## ECONOMICS COMMENTATOR

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