



Organic Agriculture in North Carolina

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Sustainable agriculture, as defined in the 1990 Farm Bill, encompasses productivity, environmental quality, efficient use of non-renewable resources, economic viability and quality of life for workers and society as a whole. Under this definition, farming that emphasizes short-run profit but sacrifices environmental quality would not be considered sustainable. Conversely, pursuing environmental quality without ensuring viability of long-run returns also would be unsustainable.

The term “sustainable” includes a number agricultural practices. Certain partial approaches target individual environmental aspects, such as practices to reduce nitrogen emission or erosion (e.g., Wossink and Osmond, 2002; Hardy et al., 2002). At the other end of the spectrum, there is organic farming, which refrains from synthetically compounded fertilizers and pesticides altogether. Organic farming systems are attracting increasing attention because they have the potential to provide benefits in terms of environmental protection, to improve food quality, and to re-orient agriculture towards market demand.

This issue of the *NC State Economist* provides an overview of organic agriculture with an emphasis on North Carolina. We report research results and describe some of the new policies and programs that may affect organic agriculture in the near future.

Organic Farming: One of the Fastest Growing Segments in Agriculture

The major factor distinguishing organic farming from other approaches to sustainable agriculture is the existence of standards and certification procedures primarily for marketing purposes. Briefly, organic guidelines have been developed in an attempt to be as sustainable as possible (using the definition above) while assuring the consumer that the amount of pesticide residue on the food product is minimized.

During the 1990s, U.S. organic crop acreage doubled and production of organic eggs and milk increased even more. Certified organic cropland grew from 403,000 acres in 1992 to 850,000 in 1997. Over the same period, total certified organic farmland increased from 935,000 acres to nearly 1.35 million acres, thus making organic farming one of the fastest growing segments of U.S. agriculture during the 1990s (Greene, 2001). Still, these figures may be significantly understated because the data were derived from certification records, so that any farmland that was treated organically but not certified would not be included in the USDA’s statistics on organic acreage. North Carolina had 980 acres of certified organic cropland in 1997, mostly vegetables, herbs and nursery products.

In December 2000, the USDA published the final rule implementing national standards for organically grown commodities. By October 2002, all farmers with over \$5,000 in

gross annual organic sales will have to be certified as abiding by these national organic farming standards. Accredited state or private organizations can certify growers for a fee. One requirement for land to be certified as organic is that it must have been treated according to organic guidelines for at least three years prior to certification.

Economics

The increase in acreage discussed above suggests that many farmers are finding organic agriculture to be a profitable venture. It is clear that there are often significant price premiums for organic crops. On the other hand, there are also higher production costs associated with replacement of higher yielding crops by more complex rotations, higher labor costs, and higher machinery costs associated with diversification. Several recent U.S. studies have indicated that organic price premiums are key in giving organic farming systems comparable or even higher whole-farm profits than conventional chemical-intensive systems. However, the variation within organic and conventional farming systems is likely as large as the differences between the two systems (see Greene, 2001 and sources mentioned there).

An organic farming system may be profitable once it has become established, but concern about the transition process of converting from conventional agriculture is a key factor inhibiting the adoption of organic farming. Conversion to organic farming involves significant costs and a high degree of innovation. The costs include conversion-related investments and information gathering expenses, in addition to possible yield reductions during the period in which biological processes become established. The biological adaptation during the first years can lead to a higher weed pressure and lower yields. At the same time, the farm manager is still involved in a learning process and access to premium prices is at least partially restricted during the statutory three-year certification period.

A North Carolina Example

Since 2000, NC State University researchers at the Center for Environmental Farming Systems (CEFS) have been investigating ways to convert from conventional to organic agriculture in the region. Established in 1994, the research center is located on 2,200 acres near Goldsboro. The station has three major components: an organic farm, a mixed farm demonstration project, and a long-term project on the environmental benefits of no-till conservation. The 80-acre organic farm at CEFS is the largest research facility of its kind in the nation.

At CEFS multi-year crop trials are conducted for various crops including soybeans and sweet potatoes. Each crop is grown under six different treatments, each of which uses a different combination of pesticides and fertilizer. The treatments range from conventional to organic. Yields and input prices are recorded so that potential profits can be compared across treatments.

We selected soybeans as an example. Preliminary economic results for organic soybeans in 2000 were found to be in line with results from comparable studies for other states and crops. Organic yields were the lowest of the six treatments. Production costs for organic soybeans fell in the middle of the six treatments: although the organic treatments had lower pesticide costs, they also had higher cultivation and tillage costs. Overall, the organic treatment was the least profitable of the six treatments when its price was calculated as the county average support price – that is, with no organic price premium. However, with a price premium of 27% or more, organic soybeans would become the most profitable treatment. Anecdotal evidence suggests that actual price premiums are much higher than 27%. For example, in 1999, 2000 and 2001 growers in Iowa sold organic soybeans for \$15, \$13 and \$14 per bushel, respectively, to the local organic elevator (Delate et al., 2002). In addition, these organic soybean prices were for the hybrid

variety most suitable for the local growing conditions and in tofu production. By way of comparison, the average price received by growers of conventional soybeans during this period was \$5.20 per bushel.

The CEFS test plots are designated to remain in the same treatment across the multiple-year study. As more data become available, it will be possible to analyze the difference in organic and conventional crop rotations, rather than just individual crops. It has been suggested that the organic treatment might exhibit long-term benefits as more nutrients are returned to the soil, possibly reducing future fertilization costs.

2002 Farm Bill and Organic Farming

Federal and state governments have responded to the growth in organic farming by stepping into organic markets as regulators and subsidizers. By doing so, they have influenced profitability. Farmers thinking about entering organic markets today are faced with a number of new policies and programs including crop insurance and conversion subsidies. The 2002 Farm Bill introduces or refines some policies and programs that address organic growers directly, and others that address all growers of a particular crop and may unintentionally change the relative returns to conventional vs. organic agriculture for particular crops.

The Farm Bill directly addresses organic agriculture through increased funding of research and extension on organic agriculture. Another provision of the new farm bill that directly affects growers is a cost-sharing program for organic certification. Individual growers are eligible for 75% of the certification cost (not to exceed \$500). Furthermore, the new farm bill provides funds for "agricultural management assistance" to producers in Connecticut, Delaware, Maryland, Massachusetts, Maine, Nevada, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Utah, Vermont, West Virginia, and Wyoming. The financial assistance

can be used for various activities, including conversion or expansion to organic agriculture. An individual producer can receive up to \$50,000 of assistance. Finally, the new farm bill makes growers who only grow certified organic products exempt from payment of an assessment under commodity program laws.

The 2002 Farm Bill may also have indirect, unintentional effects on organic growers of crops eligible for counter-cyclical payments. These include wheat, corn, grain sorghum, barley, upland cotton, rice, other oilseeds, and soybeans. For soybeans, the national average target price is raised from \$5.20 to \$5.80. To see the potential effect of the higher target price, we can apply the new target price to the North Carolina example described above. A target price of \$5.80 raises the premium necessary to make organic the most profitable treatment from 27% to 37%.

Risk Management

Since March 15, 2001, organic farmers have been able to get many of the same crop insurance policies as conventional farmers. Insurance premiums for organic crops, however, are determined by multiplying the insurance premium for a conventionally grown crop by a premium factor. The same insurance policies are also available for crops that are in transition to organic, although for both transition and organic crops, certification is required to obtain insurance. During 2001 organic growers purchased federal crop insurance on 13,800 acres, about 2% of all organic cropland.

Conversion Subsidies

U.S. federal and state governments have provided various subsidies designed to ease the transition from conventional to organic farming. One example is the USDA's cost-sharing program for certification and the Agricultural Management Assistance Program mentioned above. Some states also offer support for organic conversion. Iowa, for example, uses the USDA Environmental Quality Indicators Program (EQIP) to offer organic farmers \$50/acre up to a maximum of 40 acres to try organic

production for a 3-year period. Organic growers in North Carolina are eligible for the certification cost-sharing but are not currently eligible for any direct conversion payments.

Conclusion

Strong market signals for organically produced agricultural commodities make it likely that organic farming will remain a fast growing segment of agriculture. The various policies and programs contained in the 2002 Farm Bill combine incentives and disincentives for organic growers. Current multidisciplinary research at the Center for Environmental Farming Systems is being directed towards developing cost effective options for the transition from conventional to organic agriculture, based on an improved understanding of biophysical and economic factors.

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N.C. State Economist

Published bi-monthly by the Department of Agriculture and Resource Economics and the Cooperative Extension Service. Address correspondence to:

The Editor, N.C. State Economist
Box 8109, N.C. State University
Raleigh, NC 27695-8109

The N.C. State Economist is now on-line at:
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