LETTERS

Organic Farming Methods

The *Science* article by Nicholas Wade, "Boost for credit rating of organic farmers" (5 Sept., p. 777), accurately reflects the content of the report (*1*) of the Center for the Biology of Natural Systems (CBNS) of Washington University, St. Louis. However, because of the way the report is presented, I would expect a high proportion of readers to misinterpret it with respect to the most fundamental points. All of the comparisons between organic and conventional farms are on a *per acre basis*. The only valid comparison is on a whole-farm basis, inasmuch as the researchers report that the quality of soil and numbers of livestock are similar. I note that the organic farms had 14 more total acres (476 versus 462) but harvested 92 fewer acres of cropland (266 versus 358). Using the report's figures on crop production returns [table 9 in (*1*), p. 40], I calculate the total for the average organic farm to be $35,644 ($134 per acre × 266 acres) compared to $46,256 ($132 × 358 acres) for conventional farms. This is about 30 percent more for conventional farms on 2 percent fewer acres per farm, which translates into slightly more than 30 percent more food being produced on conventional farms.

The CBNS report contains a single sentence (*1*, p. 50) which recognizes the deficiency, but few persons are likely to catch its significance: "But because the crops produced on both samples of farms are primarily livestock feeds, not food, a study of the total output (crops and livestock) of both kinds of farms would be needed to determine the actual contribution of each kind to total food production." The same concept is recognized indirectly in item 6 (*1*, p. 55): "A thorough assessment of how the total level of food production would be affected if there were an appreciable degree of adoption of organic methods." Inasmuch as the authors indicate that livestock are similar in the two systems, it seems unlikely that a study of total farm production would alter my economic analysis to any great extent. Such might not be the case if there were substantial differences in the amount of "feed purchases or sales to balance crops and livestock" (*1*, p. 13). No data on this matter are presented.

The CBNS report states that most of the additional costs on conventional farms is for fertilizers. A difference in nitrogen requirements is the only valid difference between the two systems in fertilizer costs. The authors make a gross error when they include an additional charge for phosphorus and potassium for conventional farms. An equal charge should be made against organic farms because, unless supplemented by off-farm sources of phosphorus and potassium, organic farm soils will gradually be depleted of these important elements.

The point made above also applies to the CBNS comparison of energy intensiveness. Related to the fertilizer comparison is the use of rock phosphate (energy intensiveness of 0.19 million Btu's) on organic farms versus triplesuperphosphate (energy intensiveness, 0.67 million Btu's) on conventional farms. Based upon many years of research, we expect 3 to 4 pounds of phosphorus in untreated rock to be equivalent to 1 pound in rock that has been acidulated to break the apatite bond. This is a generalized ratio that is adjusted for soil *p*H, type of crop, and soil test level. The failure to recognize the difference in utility of the phosphorus in rock versus triplesuperphosphate unfairly penalizes the conventional system.

In relation to the additional costs on conventional farms attributed by CBNS mainly to fertilizers, I think it significant that the difference would have been much less had the comparison been made in any of the previous 20 years.

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References

1. W. Lockeretz, R. Klepper, B. Commoner, M. Gertler, S. Fast, D. O'Leary, R. Blobaum, "A Comparison of the Production, Economic Returns, and Energy Intensiveness of Corn Belt Farms That Do and Do Not Use Inorganic Fertilizers and Pesticides" (Center for the Biology of Natural Systems, Washington University, St. Louis, Missouri, 1975).

Excess Bladder Cancer in Beauticians?

The scientific literature is replete with instances of misstatements and oversimplifications in secondary sources becoming accepted as fact. A recent example occurs in a review article on "Cancer of the urinary tract" (*1*), in which the following statement occurs in the course of a discussion of bladder cancer: "The Leeds, New York, and New Orleans series all noted an excess of hairdressers and beauticians, who, as indicated by Williams (1962), might have had exposure to dyestuffs" (*1*, p. 321).

In fact, this conclusion is hardly supported by reference to the three original papers.

1) The Leeds study (*2*) reports an excess in incidence of bladder cancer among "male hairdressers" (the English term