



NORTH DAKOTA  
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## Guest Column

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Associate Director



### SUSTAINABLE AGRICULTURE OF THE FUTURE

What is sustainable agriculture? A possible definition is a production system that is biologically and ecologically capable of being maintained over long periods of time. To be acceptable, the system must be economically sustainable and ecologically sound so as not to degrade the environment in any significant way. An additional premise of sustainability is that the system will maintain the productivity of the land resource without degrading other natural resources.

Even though we don't have the answers to what systems will be sustainable in the long term, research can't be effective if we don't ask the right questions. A key thought for agriculture is the regenerative capacity of biological systems. Bob Rodale, Chief Executive Officer, Rodale Press, Inc., Emmaus, Pennsylvania, believes that there is a real leadership opportunity for agricultural sciences in the area of defining some of the significant research questions. Rodale's challenge is for the agricultural community to ask the right questions.

Bob Rodale has been a thought leader in regenerative agriculture, and as U.S. agricultural scientists begin to develop research programs to evaluate production systems that are ecologically sound, new research agendas must be formulated. As I reflect on Mr. Rodale's thesis I see two fundamental areas of research relevant to the issue of sustainability of agriculture. First, we must learn a great deal more about the long-term interactions of biological systems and, second, we need to analyze the economic and social issues. The biological issues bridge a broad group of issues ranging from microbial populations in soils to nitrogen fixation relationships among plants. I'm not capable of identifying all of the potential research issues that are in need of investigation, but I believe that the time is at hand for biological scientists to begin a major effort addressing the key biological issues.

Is there a real urgency? I think so. Those persons who have been the advocates of sustainable and regenerative production systems are gaining increased credibility because more and more lay persons are beginning to question chemical agriculture on two fronts; first, the ecological and environmental grounds, and second, long-term sustainability of intensive chemical production systems. Pest management innovations are at the crossroads of making a determination of the public acceptance of toxic chemicals as the major control agent. This has forced considerable new interest in developing non-toxic biological pest control systems. Chemical firms and public research agencies must band together to pull this one off. The research community needs to do basic research to identify biological control agents of

Continued on page 27

## In This Issue

A Secondary Market for North Dakota Farm Mortgages <i>Cole R. Gustafson</i> .....	3
ND262, ND263, and ND264; New Parental Lines of Corn <i>H.Z. Cross</i> .....	7
A Comparison of Barley Distillers Dried Grain Sunflower Oil Meal and Soybean Oil Meal As Protein Supplements in Backgrounding Rations <i>D.G. Landblom, J.L. Nelson, LaDon Johnson and W.D. Slanger</i> .....	12
Changes in Retail Sales, Population, and Pull Factors, 1980 and 1986; <i>Timothy L. Mortensen and F. Larry Leistritz</i> .....	14
Feeding Barley To Dairy Cattle <i>C.S. Park</i> .....	18
The Effect of Foliar Application of Urea Ammonium Nitrate On Yield and Protein Content of Wheat <i>L.J. Swenson, W.C. Dahnke and Arlyce Johnson</i> .....	20
Readership Assessment of North Dakota Farm Research <i>Vernon K. Senger and Vernon D. Luft</i> .....	24

**Over the Cover:** Dr. James Ozbun, North Dakota State University's new president, has roots in both North Dakota and agriculture. He is a native of Flasher and an NDSU graduate, and he served as dean of agriculture and home economics at Washington State University before assuming the NDSU presidency. Photo by Harold Caldwell.

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**EDITOR**  
Gary Moran

A summary of the readers' responses to the quality of the pictures and illustrations used in the journal is found in Table 7. A total of 68.1 percent felt that the quality was good; another 13.9 percent rated it excellent. Only three respondents (1.1 percent) felt the quality of pictures/illustrations was poor.

**Table 6. Number of Pictures and Illustrations**

Number	Pictures		Illustrations	
	Frequency	Percent	Frequency	Percent
More than needed	5	1.8	33	12.2
About right	218	79.0	225	83.0
Too few	53	19.2	13	4.8
Total	276	100.0	271	100.0

**Table 7. Reader Assessment of the Quality of Pictures and Illustrations**

Quality	Frequency	Percent
Excellent	38	13.9
Good	186	68.1
Fair	46	16.9
Poor	3	1.1
Total	273	100.0

**Continued from page 2**

major pests, and private firms must determine ways of mass producing and marketing the new biological agents. This is just one of many examples of the road to success for future ecologically sound agricultural systems.

Another area that demands considerable long-term attention relates to gaining further technical knowledge about plant interactions. This area of research will require considerable commitment from the public research community. It seems clear that as farm programs have moved U.S. agriculture more and more toward monoculture systems that pest management problems have been magnified. There is a need to evaluate a wide range of cropping systems which include alternative crop rotations and a wide range of tillage systems.

In-depth research on soil and plant interactions under alternative tillage, crop rotation and pest management systems present scientists with complex research questions. In addition to these and other biological systems research programs that need to move forward if American agriculture is to become more regenerative and sustainable, there is a need for economic and ecological evaluations of alternative production systems. If the new technology doesn't improve economic efficiency and/or improve ecological systems, the biological findings have little or no potential of being adopted. We also must begin to develop more economic analysis on the impacts of U.S. agricultural policy on the incentives for farm producers to adopt new production

**CONCLUSION**

The results of this survey indicate that readers are generally pleased with **North Dakota Farm Research** in terms of its format, content, difficulty of the reading level, and quality of pictures and illustrations. Most readers take time to read some articles in each issue, then pass the publication on to someone else to read. Most readers also found the publication to be useful to them in their respective occupations.

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technologies that will enhance the long-term sustainability of American agriculture. New policy initiatives will likely address these issues in the next decade. If the agricultural research community is going to have a significant impact on the rationalization of agricultural policy, now is the time to make the technical research inputs.

We must all recognize in this transition that farmers don't intentionally want to lose soil or contaminate the environment or spray toxic chemicals on wildlife or adopt any other practice that will make agriculture environmentally unacceptable. The scientific community must provide the research basis to help farmers move from unacceptable practices to new production practices that are economically profitable and ecologically acceptable. The ultimate solutions may well need to be incorporated into a national agricultural policy that will provide farmers with financial incentives to help them make the transition in production systems.

We often speak of America as being the richest country in the world. It would seem that it is high time to invest some of that wealth in public research programs that will advance new economically and environmentally sound agricultural production systems. That concept must become the guideline for "Low-Input Sustainable Agriculture" research programs.

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