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Guest Column

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Director of Station Research

Biological Control Systems — A Key to Pest Management in the Future

The Agricultural Experiment Station has worked with biological pest control mechanisms for the past 100 years. Classical plant and animal breeding programs have selected genetic material for resistance to major disease and insect pests. This effort has had only marginal success in dealing with pest management problems, thus creating the need to use chemicals, tillage and rotation systems to control many insects, diseases and weeds. Modern production systems have become increasingly dependent on purchased inputs to maintain economical pest control.

Environmental concerns in the United States have led the EPA to require increasingly rigorous evaluations for new pesticides. In addition, all existing pesticides must be re-registered using the new, more rigorous, testing procedures. These concerns have led to an increased research emphasis on the development of biological control systems to create economically and ecologically acceptable new means of pest control. If we are to succeed in developing this new technology, significant research resources must be allocated now to discover new sources of biological pest resistance.

Two major sources of biological pest management have opened up in the past decade. First, the search for exotic sources of genetic resistance, insect control agents and pathogens to use in biological control management strategies has been greatly intensified. Biocontrol has truly become an international science, with researchers throughout the world cooperating in the search for new biological agents. USDA and state research groups have conducted rigorous collection expeditions, searching for biological agents for use in high-priority pest management programs. Several successes have been achieved in weed control programs in the southern United States. In North Dakota, an intensive research program focused on leafy spurge control is making significant progress. I believe the research supported by the North Dakota Agricultural Experiment Station and USDA-APHIS and Agricultural Research Service scientists will lead to significant control success in the next ten years.

A second, highly promising area of technology is the incorporation of genetic sources of pest resistance, using gene transfer systems developed by the genetic engineers of the future. This technology will greatly enhance the progress made by traditional plant and animal breeding programs and will lead the way to more efficient pest management systems.

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On the Cover: Mike Rose, NDSU Extension Service agent in McHenry County, examines an experimental site where flea beetles that control leafy spurge have been released. An article in this issue discusses research efforts on biological control of leafy spurge. Photo by Ryan Taylor.

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The North Dakota Agricultural Experiment Station has several teams of scientists working on biological control programs for the state's farmers and ranchers. These programs range from research focused on animal disease prevention to genetic insect and disease resistance in sunflower, cereal grains, sugar beets and potatoes. The lead article in this issue is about a major biological control research effort directed toward control of leafy spurge. This effort will ultimately save North Dakota farmers and ranchers millions of dollars each year when control is finally achieved. Biotechnology will open many doors in the struggle for environmentally and economically acceptable pest management programs. Public concern regarding health and environmental issues makes it extremely important that state and federal appropriations adequately fund the research programs needed to lead U.S. agriculture into the next century. The electorate must be informed of the consequences of failure to adequately prepare agricultural production systems for the environmental challenges of the next century.

Katherine Reichelderfer, senior fellow with Resources for the Future, sums up a perspective in a new book, *Agriculture's Contract with Society*, where she indicates that society is becoming more and more demanding regarding environmental quality. She goes on to say that, "Agricultural scientists need to give greater attention to concerns of society and seek profitable adjustments in production processing, packaging and marketing practices." Certainly, biocontrol research programs will play an important role in this effort as the husbandry of agricultural resources becomes increasingly scrutinized by the general public. Land-grant universities must help farmers and ranchers meet the challenges of that environmental scrutiny.

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