Symposium

Food and the Environment: IPM Meets the 21st Century

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Integrated pest management (IPM) programs exemplify the positive impact plant pathologists can have on our nation's production of plants and on our environment. At its best, IPM offers growers ways to reduce pest damage to crops while reducing pest management costs. In the process, IPM often reduces the amount of crop protectant chemicals required to treat diseases and other pests, decreasing possible environmental impacts and calming consumers concerned with food safety. As our nation and the world seek ways to balance ecological and economic concerns, IPM offers a fulcrum that puts plant pathology to work, growing healthy plants and maintaining a healthful environment.

At both the basic and applied levels of research, plant pathology has played a major role in developing successful IPM programs. To give some idea of the variety of IPM programs in the United States, this symposium includes four outstanding examples for fruit, wheat, peanuts, and potatoes. These programs demonstrate the ways in which IPM provides solutions to crop production problems. They also show the methods used to develop and deliver IPM in a set of crops from different parts of the country. Some systems emphasize careful timing of applications of crop-protectant chemicals, others emphasize cultural techniques, and others emphasize genetic techniques—yet each combines the most appropriate techniques. Most IPM programs now use personal computers in some way, either to develop models, monitor and record information, deliver information, and provide decision support or to teach growers what IPM means to their crop. Each example program proved successful in moving a crop system away from an overdependence on pesticides to a more balanced and stable means of production.

If success means adapting to change, IPM will continue to succeed. Three presentations in this symposium focus on major issues facing IPM today. While IPM started primarily as a response to pesticide resistance and increasing crop damage, the emphasis is evolving toward environmental concerns. The success of IPM can be measured in different ways, but however it is measured, the public and policymakers need to be aware of the success and continue to support IPM development. In the future, biocontrol, tools from molecular biology, and an emphasis on host management rather than parasite management will undoubtedly take on increasing importance in crop management. As these papers show, the techniques continually being adapted and developed by IPM researchers will contribute to a more sustainable agriculture in the 21st century.

From Profitability to Food Safety and the Environment: Shifting the Objectives of IPM

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Polluting streams and groundwater, eliminating endangered species, endangering the health of farm workers, and threatening consumers' food safety are just some of the recent headlines that have made the tough business of farming even tougher. Agribusiness's early reaction to this criticism was that the headlines were controlled by extremists—even actors! But, upon closer inspection, after the extremism is filtered away, there are some kernels of genuine concern that are based on fact. Some rivers are polluted with nitrates, some of the wells do have traces of pesticides, some produce does have higher than necessary pesticide residues when harvested. These new concerns, a few of them substantiated, are becoming increasingly important in farm decision making, along with profitability. Integrated pest management (IPM) offers a plan to profitably cope with these new concerns in addition to the traditional pest management mission.

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A Brief History of IPM

From the first philosophical description of integrated control (13), IPM has grown into an intricate series of programs based on pest suppression and management concepts. At present, IPM is a systematic approach to crop protection that uses a variety of information and decision-making paradigms. IPM seeks a balance between a reduction of purchased inputs and crop yield and quality. Concomitant goals include improving the economic, social, and environmental conditions on the farm and in society. Moreover, the concept emphasizes the integration of pest-suppression technologies such as biological control, using beneficial organisms against pest organisms; chemical control, judiciously using pesticides and other chemicals in a responsible manner; legal control, abiding by state and federal regulations that prevent the spread of pest organisms; and cultural control, using rotations, cultivations, and other farm practices that reduce pest problems. IPM programs involve careful monitoring of pest populations and the crop environment in the field. This information allows farmers to institute management practices only when they are needed to attain the farmer's individual goals for his/her crop. In other words, IPM is determining how serious your problem is, and what your management options are, before you take action.

IPM requires the grower to understand how the crop grows, how pest populations develop, what the control options are in each specific pest management case, and what the return on investment in these control options is,