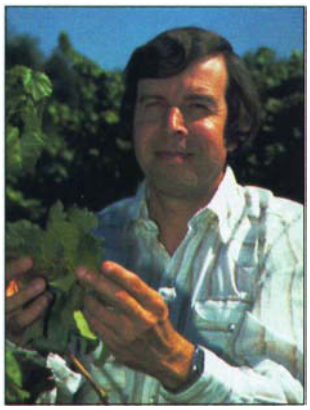

Building the IPM continuum

Frank G. Zalom, Director
UC Statewide IPM Project

This year marks the 20th anniversary of the UC Statewide Integrated Pest Management (IPM) Program, which has been dedicated to furthering development and practice of IPM in California by facilitating UC research and extension activities. Its mission remains relevant today in addressing the environmental, social and economic challenges associated with a pest management system in transition.

While a sustainable, ecologically based IPM approach has long been a desired goal of IPM developers and practitioners, the current IPM reality varies with the system itself and changes in response to external factors. Variables defining an IPM system include location-specific environmental conditions, the pest complex, resident natural enemies or antagonists, economic and sociological structures, and available research. The availability of IPM-compatible tactics, private and public infrastructure, economic and other incentives, and community support also influence its potential for adoption. IPM as a paradigm is universal; IPM in practice becomes specific to the intended crop, site or situation.

The concept of IPM as a continuum has been embraced as a method for defining IPM systems in a manner that maintains the ecologically based goal while acknowledging the limitations of current knowledge. In the IPM continuum, professional scouting and use of available action thresholds are the minimum activities. Monitoring increases knowledge of crop status, pests and beneficial organisms, supporting better-informed pesticide use, and more importantly, decisions not to apply chemicals.

Further along the continuum, IPM systems incorporate preventative, nonchemical horticultural or agronomic practices and biologically based tactics such as host-plant resistance, pheromone mating disruption, microbial controls and biological controls. "Reduced-risk" pesticides, which present less risk to human health and the environment, would be used sparingly and only when other options are not possible. At the highest level of the continuum, IPM assures that pest and crop management decisions are integrated and ecologically based.

IPM defined

Integrated Pest Management (IPM) is an ecologically based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of agronomic or horticultural practices, and use of resistant varieties. Embracing a single tactic to control a specific organism does not in itself constitute IPM, even if the tactic is an essential element of an IPM system. Pesticides may be used to remove the target organism, but only when monitoring indicates that they are needed to prevent economic damage. Pest-control tactics, including pesticides, are selected and applied to minimize risks to human health, beneficial and nontarget organisms, and the environment.

The process of building the IPM continuum identifies the state of the art, as well as gaps in research and available pest control technologies. Conceptualizing IPM as a continuum enables individuals or organizations to evaluate how their current pest management practices relate to what is possible in a nonjudgmental way, while acknowledging the degree to which IPM-compatible practices are being used.

California can be proud of the individual growers, organizations and in some cases whole industries that have successfully moved forward along the IPM continuum, yet we have only begun to fulfill IPM's potential. Researchers in the public and private sectors have developed a remarkable number of practical, IPM-compatible tools. These include new applications of host-plant resistance and biological controls; "reduced-risk" pesticides including microbial agents and mating disruption; new classes of pesticides which are more selective and less disruptive to nontarget species; monitoring approaches like pheromone trapping, degree-day models and immunoassays; precision application techniques for pesticides; and refinements of cultural controls such as canopy management, mulches and sanitation.

Some of these tools have become widely used, while most have not. Many need further adaptations to achieve effective and economical on-farm results. Others need to be more widely demonstrated. IPM-compatible tools for managing several key pest problems remain elusive, and will require innovative research to be managed without conventional pesticides.

We have a long way to go before a majority of growers and pest managers can and do practice IPM at the highest levels of the continuum. Reaching that level will require growers, consultants, scientists, government agencies and associated industries to work together, moving forward a step at a time.

Today IPM is an accepted and unifying paradigm. It is the legacy of the visionaries who proposed the radical idea for such a program, and the people whose support in the legislature and within the University allowed it to begin and then flourish. It remains the strongest framework under which the biological, environmental and regulatory challenges facing pest management can be addressed.