APS Committee's Concerns on Fungicide Usage . . .

The APS Chemical Control Committee believes the following statement, approved by APS Council, addresses concerns of most plant pathologists facing the responsibility of making day-to-day control recommendations under the threat of potential fungal resistance to preferred fungicides:

Statement regarding the registration of fungicide usage to avoid resistant strain development. Fungal resistance to site-specific fungicides has been scientifically documented and the use of fungicide mixtures and other usage patterns may be of value in prolonging the efficacy of specific fungicides essential to Integrated Pest Management (IPM) programs. The plant disease control community has the responsibility of dealing with the fungal resistance problem and it should be given the latitude and flexibility to develop chemical use directions which consider and utilize the best available information on reducing the threat of resistance. Delay in the development of use-strategies until resistant strains become economically damaging is risky; once such strains develop they render the fungicide ineffective, may spread rapidly and cause serious crop losses. Frequently, resistance in a target organism develops almost simultaneously in different areas which have similar disease potential and fungicide use patterns.

No single use strategy such as alternating or mixing non-related fungicides is appropriate or adequate for all fungicides or disease control situations. The target pest spectrum, the host, and the characteristics of preferred fungicides and alternatives must be assessed before specific recommendations can be formulated and disseminated. Laboratory, greenhouse, and field studies on target pests or similar pests and worldwide experience regarding the development of resistance to fungicides should be considered in evaluating the potential for resistance to a new fungicide in the United States.

Theoretical mathematical models constructed to describe the selection process that occurs as fungicide resistance develops (1–3) predict that the use of fungicide mixtures and alternating fungicides with different modes of action delay the buildup of resistance in the fungal population. Although experimental data are lacking because these models are difficult to test under field conditions, circumstantial evidence supports the use of mixtures and alternating fungicides to reduce the threat of resistance. Use of a fungicide whose mode of action involves multiple metabolic pathways assures that the rate of the disease epidemic and the sudden threat of major crop loss will be reduced in the event that single-site fungicide resistance develops.

To accommodate the urgent need to maintain disease control in the face of increasing fungicide resistance problems, the APS Chemical Control Committee recommends that regulatory agencies should remain flexible on the subject of product label use directions and recognize the delay or prevention of resistance as a valid registration objective. The Committee further recommends that labels discourage exclusive, season-long use of a single fungicide to which suspected potential for field resistance has been confirmed and provide guidelines for management techniques which will delay the appearance of resistance, thus prolonging the useful life of the fungicide arsenal.

LITERATURE CITED

1. Delp, C. J. 1980. Coping with resistance to plant disease control agents. Plant Dis. 64:652-657.
2. Kable, P. F., and Jeffery, H. 1980. Selection for tolerance in organisms exposed to sprays of biocide mixtures: A theoretical model. Phytopathology 70:8-12.
3. Skylakakis, G. 1981. Effects of alternating and mixing pesticides on the buildup of fungal resistance. Phytopathology 71:1119-1121.

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. . . Are Shared by EPA

The United States Environmental Protection Agency shares the concerns of the APS Chemical Control Committee on the important matter of fungicide usage to avoid resistant strain development, and for the past several years the Agency has been attempting to follow a course of action which reflects the general philosophy presented in the committee's position statement. We have no specific comments to offer on the position statement as we generally agree with the recommendations presented and are appreciative of the committee's interest in providing input for the development of Agency labeling policy.

The issue of delaying the development of resistant fungal strains is a relatively new subject of consideration on fungicide labeling, and due to the very recent recognition of resistance in the field and the lack of scientific studies to clearly indicate the best approach to delay resistance, the Agency feels it would be premature to issue for publication an official Agency position, as the committee requested. It is anticipated that revisions will have to be made from time to time in our internal policy in order to be consistent with the latest scientific findings in this rapidly expanding area of investigation. Our internal policy is based on information gathered from the public literature, data submitted to the Agency, discussions with certain research and extension plant pathologists, recommendations in the FAO Model Extension Leaflet "Resistance of Plant Disease Pathogens to Pesticides," and recommendations in the APS contract report to the EPA in June 1979, "Contemporary Control of Plant Diseases with Chemicals." I am fully supportive of the positions in the APS Chemical Control Committee's statement on fungal pesticide resistance.

We favor the development of labeling which provides for maximum user flexibility in attempting to delay the development of resistant fungal strains while protecting the environment from unnecessary pesticidal burden. The committee's comments or suggestions on how to improve the labeling of fungicide products are welcome at any time.

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