

Chemigation Symposium, IR-4 Workshop Important to Vegetable Growers

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Two national meetings held in 1981 covered topics of importance to vegetable pathology: the National Symposium on Chemigation on August 20 and 21 at Tifton, GA, and the IR-4 Vegetable and Fruit Workshop on September 29 and 30 and October 1 at St. Louis, MO.

Chemigation Symposium

Chemigation is the application of a chemical into the water flowing through an irrigation system and encompasses both soil- and foliar-applied chemicals. Success depends on the uniformity of chemical distribution, which is proportional to the uniformity of water distribution by the irrigation system. One of the most proficient irrigation systems, in terms of uniform distribution, is the center pivot system, and most of the symposium dealt with chemigation via this system.

Chemigation offers several management advances. Many chemicals, including nematicides, require large quantities of water to be effective, and chemigation allows incorporation of water to the desired depth. Effectiveness of most foliar fungicides depends on complete plant coverage, and the large volume of water used in chemigation permits wide distribution of the protective chemical. Wash-off of fungicides may be a problem unless low rates of water or water-immiscible (oil) formulations of the chemicals are used. Center pivots have been developed to apply as little as 0.4 cm of water per revolution.

Chemigation is an excellent technique for ensuring timely application of fungicides. The method can be used during rain and is more independent of weather than either aircraft or ground-sprayer application. Center pivots can travel over a field under much higher soil moisture conditions than most tractors.

The cost of chemigation during a normal irrigation is low and associated

with the chemical injection system. The cost when irrigation is not needed depends on the amount of water applied and generally is one-third to one-half that of a conventional chemical application.

Fungigation—application of fungicides through irrigation systems—is currently being used to control vegetable and field crop diseases in the United States. In the Pacific Northwest, Du-Ter is being applied through irrigation systems to control early blight on potatoes. Also in the Pacific Northwest, sulfur is being applied in the same manner to control powdery mildew on sugar beets. National and state labels are available for fungigation of certain fungicides on potatoes and tomatoes.

Active research on fungigation on vegetables is being conducted in several areas. In Michigan, H. S. Potter has been conducting research with fungigation for several years. In trials with early blight and Botrytis blight on potatoes, application of Bravo 6F with a boom sprayer or by fungigation (solid set) was equally effective in controlling early blight. Control of Botrytis was better with fungigation, primarily because of better distribution of the fungicide on the lower portions of the plant. In trials with bacterial leaf spot and Septoria leaf spot on tomatoes, Bravo 500 plus Citcop 4E was more effective when applied by fungigation (center pivot) than by aircraft.

In Georgia, D. R. Sumner has conducted research with fungigation, using both foliar and soil fungicides, to control vegetable diseases. Control of foliar diseases of cucumber was equal with fungigation (solid set) and tractor-mounted sprayer application if cultivars with disease tolerance were used and epidemics did not develop until near the end of the harvest period. Epidemics of downy mildew and target spot were not controlled with fungigation in the fall crop. Vapam applied through irrigation water was as effective as chisel injections in reducing populations of soilborne pathogenic fungi and reducing root and hypocotyl disease severity in collard, spinach, cucumber, and snap beans.

Based on research findings and results obtained by growers, fungigation is an effective way to apply fungicides to

numerous vegetables, and the number of label registrations for this use pattern should increase in the near future.

IR-4 Workshop

The Plant Pathology Working Group reviewed 199 "researchable" food use project requests for vegetables and fruit. This group of 15 plant pathologists and nematologists, led by J. W. Lorbeer of Cornell University, reviewed the project requests and assigned a high (top priority) rating to 124.

Several suggestions for consideration by members of the IR-4 program were formulated at the workshop. The primary suggestion concerned the need for faster registration of new fungicides. As growers become familiar with the efficiency of newer fungicides, there will be pressure to use them on "minor" crops, such as vegetables. Procedures need to be developed to speed up the labeling of these products for vegetable growers.

Another concern was the resistance of plant-pathogenic fungi to fungicides that has occurred in recent years. To overcome resistance and to prevent future instances of resistance, growers have used either tank mixing or alternate sprays of a selective fungicide and a broad-spectrum fungicide. Dual registration for using fungicides in these and other appropriate ways is needed. Also, the use of biological control agents will likely increase in the near future, and these agents will need rapid registration. Hopefully, the IR-4 program can be of assistance.

The overall critique of the workshop was favorable. Members of the working group gained insight into the operation of the IR-4 program, and interest in future participation in the program was stimulated.

We wish to thank the following for their contributions to this month's column: J. W. Lorbeer, Department of Plant Pathology, Cornell University, Ithaca, NY; H. S. Potter, Department of Botany and Plant Pathology, Michigan State University, East Lansing; and D. R. Sumner, Department of Plant Pathology, and E. D. Threadgill, Agricultural Engineering Department, University of Georgia Coastal Plain Experiment Station, Tifton.

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