GLENN WHITNEY, Texas A&M University Agricultural Research and Extension Center, Beaumont

Fungicide Tests on Row Crops

The two responses a producer desires from foliar applications of fungicides are an increase in yield and an increase in quality of the harvested crop because of disease control. When a new fungicide is released, our job as plant pathologists is to determine the correct rates and the times of application to obtain the optimum benefit in yield and quality with that particular fungicide. Once this has been accomplished, we should investigate alternate applications or tank mixes with other fungicides to prevent the fungal resistance problems that have occurred in some areas. That is what *Fungicide and Nematicide Tests* is striving to report—how new products control different diseases in various crops in different parts of the country.

In 1983, 87% of the articles on row crops in *Fungicide and Nematicide Tests* pertained to three important crops: peanuts, soybeans, and tobacco.

Peanuts. The leading fungicide for controlling both early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) in peanuts is chlorothalonil (Bravo). However, several others performed well in tests from Texas to Georgia. In Georgia, Bravo performed better than all other compounds tested in increasing yield and lowering the amount of defoliation; this occurred at both optimum and a 2-week delayed harvest. Compounds that showed excellent activity against late leaf spot included propiconazol (Tilt), bitertanol (Baycor), and RO-151297. These compounds performed equally well in Florida.

An interesting study in Virginia determined the efficacy of fungicides applied according to leaf spot advisories produced daily by computerized assessment of humidity and temperature data (Phytopathology 64:385-388). Several reference fungicides were applied on the conventional 14-day schedule for a total of six applications. The leaf spot advisory recommended only two applications. For a given fungicide, leaf spot incidence was consistently higher in plots sprayed according to advisories, but the amount of defoliation never differed significantly from amounts in plots sprayed on the conventional 14-day schedule. Yield and value assessments provided evidence that leaf spot advisories can effectively reduce expenditures for leaf spot control without resulting in a measureable loss because of increased disease.

Sclerotinia blight caused by *Sclerotinia minor* was controlled in several experiments with vinclozolin (Ronilan), but applying the material as close to initial Sclerotinia blight signs as possible was critical to achieving maximum yield.

Southern blight caused by *Sclerotium rolfsii* was controlled effectively by PCNB (Terraclor) and OAC 3890 in both Texas and Georgia. One interesting observation was that plots treated with fungicide-insecticide combinations generally had lower numbers of disease loci and higher yields than those treated only with the fungicide. These differences were not always significant, however.

Soybeans. Benomyl (Benlate) and thiophanate-methyl (Topsin M) remain the leading labeled treatments for soybean disease control, particularly in the southern United States. The warm temperatures and high humidities predispose soybeans to attack by anthracnose (*Colletotrichum dematium* var. *truncata*), pod and stem blight (*Diaporthe phaseolorum* var. *sojae*), Cercospora blight (*Cercospora kikuchii*), and brown spot (*Septoria glycines*). In tests conducted in the southern United States, yields have been increased an average of 5 bu an acre. In some years, however, yields are not increased enough to pay for the treatment in some areas. To alleviate this situation, point systems for fungicide applications are being developed in several states. If a reliable system can be developed, producers would be saved the expense of fungicide treatment in those years when treatments do not increase yield.

A disease new to some southern states is stem canker caused by *Diaporthe phaseolorum* var. *caulivora*. The disease was very serious in Louisiana in 1983, increasing to very high levels by the end of the growing season. Both Topsin M and Benlate significantly suppressed the incidence of stem canker from the time of first application to the end of the growing season. Two applications were made, at flowering when the disease was first noted and 16 days later. The Topsin M-treated plants had a lower disease rating than those treated with Benlate. Plants from both treatments produced more pods, larger seed, and higher yields than untreated controls (Table 1).

Tobacco. Results of several experiments show that metalaxyl (Ridomil), broadcast and preplant incorporated, was highly effective in reducing the incidence of black shank (*Phytophthora parasitica* var. *nicotianae*) and blue mold (*Peronospora tabacina*), with corresponding yield increases. In one experiment, Ridomil was used as a foliar application for a rescue treatment from blue mold. Three weekly treatments were applied after the disease had been active about 2 weeks. Results suggest rescue treatments may be advisable if blue mold activity continues over a significant period and sprays are begun promptly.

Both Ridomil and benalaxyl (Galben) have proved highly effective as foliar applications in greenhouse and field trials. Burley producers, however, are not accustomed to applying foliar pesticides except at topping time and regularly use preplant or transplant water applications. Ridomil and Galben were compared in transplant water and broadcast preplant incorporated applications because of their systemic characteristics and marked differences in water solubility. Phytotoxicity was noted for both treatments when used in transplant water. These treatments did not significantly reduce blue mold compared with the untreated control. Ridomil was superior in blue mold control when preplant incorporated and resulted in marked yield increases. Galben applied preplant did not control blue mold.

Some researchers are experimenting with ultralow-volume applications by means of control-droplet applicators. Work has been done in dry beans, soybeans, and peanuts. Preliminary results generally show that this method is as effective as conventional high-volume water application.

Dr. Whitney is editor of the field crops section of Fungicide and Nematicide Tests, *David F. Ritchie, Editor, published annually by the New Fungicide and Nematicide Data Committee of The American Phytopathological Society. Copies of current and past volumes may be obtained from Richard E. Stuckey, Business Manager F & N Tests, Plant Pathology Department, University of Kentucky, Lexington 40546.*

Table 1. Effect of fungicide treatments on stem canker of soybean in Louisiana

Treatment	Rate/acre (lb)	Disease incidence[a]	Pods/plant[b]	Seed/lb	Yield (bu/A)
Topsin M 70WP	1	23.4	94.9	2,719	46.9
Benlate 50WP	1	36.6	83.6	2,790	44.6
Control	...	67.7	68.6	3,013	36.9

[a] 0 = No disease, 100 = severely diseased.
[b] Mean of four replications of 20 plants per replication.

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