

Fungicide and Nematicide Update

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Foliar-Applied Fungicides in Soybean and Peanut Disease Control

Disease control work with foliar-applied fungicides is extensive, involving several row crops, but by far the most work has been done on soybeans and peanuts. Both crops respond to foliar-applied fungicides with improved quality and increased yields.

Soybeans. Foliar fungicides applied at growth stages R-3 and R-5 effectively control anthracnose (*Colletotrichum dematium* var. *truncata*), pod and stem blight (*Diaporthe phaseolorum* var. *sojae*), and the *Cercospora* complex (*Cercospora kikuchii*). Organic fungicides labeled for use on soybeans include benomyl (Benlate), chlorothalonil (Bravo), thiabendazole (Mertect), and thiophanate-methyl (Topsin-M). These fungicides are usually applied by aircraft in about 5–10 gallons of water per acre.

Reports from Kentucky, Texas, and Mississippi are typical of what might be expected in the southern United States. Kentucky reported tests with DPX 3866, benomyl, fentin hydroxide (Super Tin), chlorothalonil, thiophanate-methyl, and thiabendazole. DPX 3866, benomyl, and fentin hydroxide significantly controlled pod and stem blight and anthracnose in the Williams variety of soybean, with corresponding yield increases. Chlorothalonil and thiophanate-methyl also controlled pod and stem blight and anthracnose but did not increase yields. Thiabendazole produced some control of pod and stem blight but did not control anthracnose and did not increase yields.

Texas reported tests with benomyl, fentin hydroxide (Du-Ter, Super Tin), thiophanate-methyl, thiabendazole, and chlorothalonil. All treatments controlled pod and stem blight and anthracnose in the Davis variety of soybean, but only fentin hydroxide and chlorothalonil significantly increased yields. Mississippi reported tests with benomyl, chlorothalonil, fentin hydroxide (Du-Ter), and thiabendazole to control brown spot (*Septoria glycines*). All treatments gave excellent control and produced significant yield increases.

Test reports from the Indian Council for Agriculture Research complex indicate that leaf blight caused by *Setosphaeria glycinea* can be controlled by spraying with fungitoxicants. Applications were started 1 month after planting, when initial infection occurred, and were repeated at 10-day intervals, for

a total of five. Carbendazim, a systemic fungicide, gave the most effective control, with yield increases 150% over the control. The second highest yield increase—about 88%—was obtained with mancozeb.

The fungicides that work well against soybean diseases in the United States seem to be less effective in Brazil. In aircraft-applied fungicide tests reported by the National Soybean Research Center in Brazil for two consecutive years, little disease control and no significant yield increases resulted.

Peanuts. Annual crop losses attributed to fungal diseases of peanut foliage range from 1 to 50%. The two most widely distributed and destructive diseases of peanut are early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*). Peanut rust (*Puccinia arachidis*) and web blotch (*Phoma arachidicola*) are also widely distributed but of lesser economic importance; the incidence of rust, however, has increased in recent years. Because peanuts are a high-value crop, the producer must protect his crop with multiple applications of foliar fungicides to obtain the desired quality and yield. Approximately five to seven applications are necessary, the first about 30–40 days after planting, with subsequent applications at intervals of 10–14 days until 2 or 3 weeks before harvest.

Before 1971, dust formulations of sulfur, copper, and a combination of the two were used to control peanut diseases, but with the introduction of organic fungicides, there was a rapid change from dusting to spraying. Among the currently registered organic fungicides are benomyl (Benlate), captafol (Difolatan), chlorothalonil (Bravo), fentin hydroxide (Du-Ter, Super Tin), and mancozeb (Dithane M-45, Manzate 200). Chlorothalonil is one of the most extensively used because it is effective against early and late leaf spot, rust, and web blotch. Before tolerant strains of *Cercospora* developed in the southeastern United States, benomyl was highly effective against early and late leaf spot, although it did not suppress web blotch or rust. Fentin hydroxide is effective against early and late leaf spot but is not widely accepted by peanut growers because of its phytotoxicity.

Data from Texas and Georgia, two widely divergent peanut-producing states, show the value of a fungicide program. In 1981, leaf spot severity in

Georgia was slight until 3 weeks before harvest, and late leaf spot was the only disease observed during the assessment period. Treatments included chlorothalonil, CGA-64250, fentin hydroxide (Du-Ter), and bitertanol (Baycor). Each treatment significantly reduced infection and increased yields in both the first and the second harvest.

In Texas, some early leaf spot and rust were observed but late leaf spot predominated. Treatments were CGA-64250, chlorothalonil, fentin hydroxide (Du-Ter), benomyl, and mancozeb (Dithane). Benomyl and mancozeb did not significantly reduce infection, but chlorothalonil, fentin hydroxide, and CGA-64250 did. All treatments but fentin hydroxide reduced defoliation, and all significantly increased yields.

Sclerotinia blight caused by *Sclerotinia minor* is becoming a problem in peanuts. Virginia reported a severe level of infection developing before harvest. Three applications of KNJ-0946, iprodione (Rovral), or vinclozolin (Ronilan) significantly decreased disease incidence and increased yield. KNJ-0946 resulted in the largest yield increase—1,991 lb over the untreated control.

Cylindrocladium black rot of peanut caused by *Cylindrocladium crotalariae* was controlled by soil fumigants in Virginia. Results of tissue and soil analyses provided additional evidence of the efficacy of soil fumigants, and yields were increased significantly. Also in Virginia, an experiment showed how leaf spot advisory programs can aid the peanut producer. Seven applications of fungicides were made on a standard 14-day schedule and evaluated against three treatments applied according to a leaf spot advisory program. All fungicide treatments significantly suppressed leaf spot before harvest. Disease incidence was higher in advisory plots, but yield and value assessments consistently showed that the advisories reduced expenditures for leaf spot control without a measurable loss to disease.

Dr. Whitney is editor of the field and cereal crops section of Fungicide and Nematicide Tests, William C. Nesmith, 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.