3-1983

# Proceedings of the 10th Annual Meeting, Southern Soybean Disease Workers (March 15-17, 1983, Houston, Texas): Significance of Soybean Diseases

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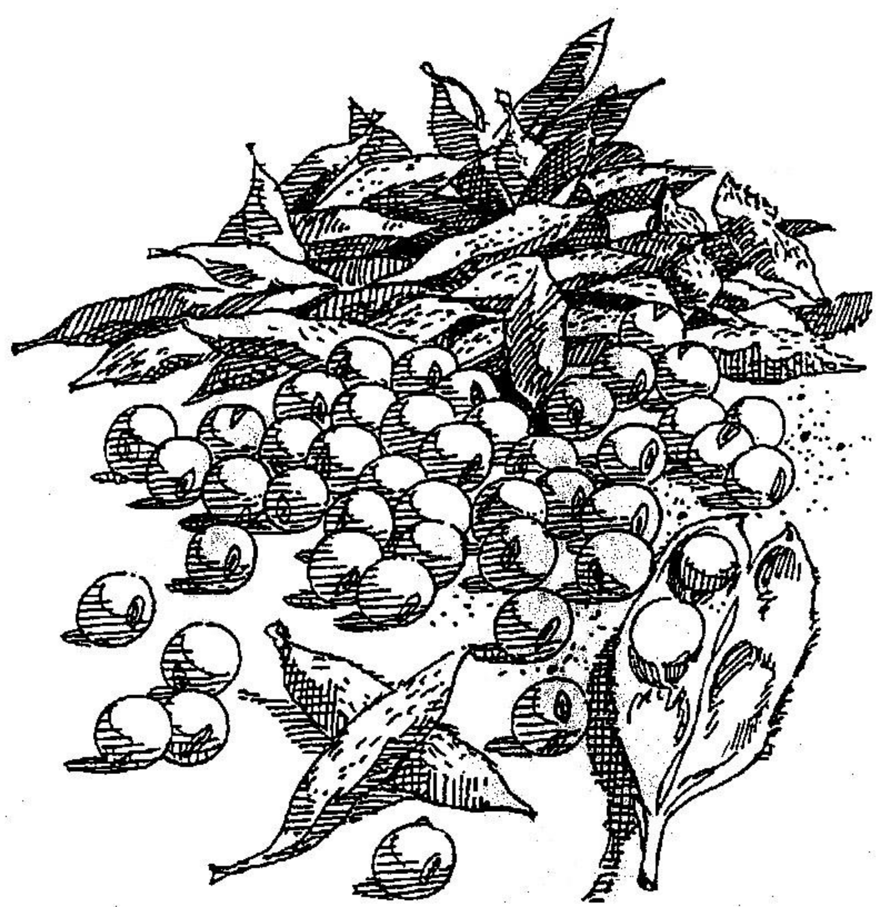
# PROCEEDINGS OF THE SOUTHERN SOYBEAN DISEASE WORKERS



## 10TH ANNUAL MEETING

March 15-17, 1983 | Houston, Texas

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SIGNIFICANCE OF SOYBEAN DISEASES

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# PRESIDENTIAL ADDRESS

WAYNE M. WINNER

CHEVRON CHEMICAL COMPANY

There is nothing more important to our society than agricultural production. In 1910, the average American farmer produced enough to feed about seven people. Today, the average farmer feeds approximately 78 people. This production is achieved by 1.6% of the American population. While 60% of the gross income in China is spent for food, only 13.8% of our gross income goes for food. How do we do it? ....... By working cooperatively - producer, researcher, extension, consultant and industry. At our annual meeting last year producer John Adries from Washington, Louisiana stated "I need all of you".

The Southern Soybean Disease Workers is one organization where we work as a team to help increase the income per acre for the American farmer.

During a special session at the 1982 annual SSDW meeting, the lack of soybean disease awareness was identified as an area that the organization should place particular emphasis. During 1982 we formed a Disease Awareness Committee which formulated and initiated numerous activities to increase everyone's awareness of soybean diseases. Extension - industry sponsored field days and a compromise point system are just a few activities initiated by the committee. Activities were pointed toward educating the producer and making everyone more aware of soybean yield losses caused by disease.

Using a "hands on approach" two workshop sessions were initiated which many of you participated in yesterday. These workshops were organized to help those attending become more knowledgeable in indentifying soybean diseases and to become aware of the importance of nematodes in soybean production. As many of you have told me, our objective was met and these workshops will become a part of our annual meetings in the future.

I want to thank all of you for your cooperation during the past year and encourage each and everyone of you to put forth the special effort which is needed to help the American farmer obtain a more profitable livelyhood.

# SOYBEAN RESEARCH NEEDS AND THE AMERICAN SOYBEAN ASSOCIATION

The dramatic increase in soybean production is attributed, in part, to past success in solving production problems that limit soybean yields. In 1981, approximately $40M was invested in soybean research from Federal and State funds and grower checkoff programs. In times of shrinking research base budgets, it is essential that research efforts be concentrated on those areas which have the best chance to increase soybean production efficiencies. The Soybean Research Advisory Panel, established in the 1981 farm bill, can serve soybean farmers and the soybean industry by developing research needs and recommendations. This presentation reviews present funding of soybean research and discusses the role of the Soybean Research Advisory Panel in developing priorities.

To be presented by Keith J. Smith at Southern Soybean Disease Workers meeting March 16, 1983.

# PESTICIDE ASSESSMENT IN THE ADMINISTRATIVE HEARING: AN EDUCATIONAL GUIDE FOR THE AGRICULTURAL SCIENTIST

M. T. Olexa & A. H. Daniels

This report is part of a larger effort to investigate current issues in agricultural law and to present extension information on legal topics of importance to farmers, agricultural scientists and people in farm-related professions nationwide. This specific educational material is intended to aid the agricultural scientist (especially one who serves as a witness in formal administrative hearings concerning registration of pesticides) to prepare both written and oral testimony and to anticipate tactics common to legal adversary proceedings. Direct and cross-examination are emphasized. Cross-examination allows an opposing attorney to question the qualifications of the witness and to determine the reliability (creditability) of that witness's testimony. The scope of allowable cross-examination is partly determined by the witness's oral and/or written direct testimony. Any matter to which a witness testifies on direct examination can be the subject of cross-examination. If under cross-examination a witness appears confused or unsure of his testimony, such testimony may be accorded little evidentiary weight by the Administrative Law Judge. Therefore, to present testimony (data) most effectively, agricultural scientists involved in such cases must understand the tactics of opposing attorneys and the legal significance of their testimony.

# SOUTHERN UNITED STATES SOYBEAN DISEASE LOSS ESTIMATE FOR 1982

Southern Soybean Disease Workers, Soybean Disease Loss Estimate Committee: Edwin F. Koldenhoven, Griffin Corp.; R. Rodrigues-Kabana, Auburn University; H. Kenneth Whitam, L.S.U.

## ABSTRACT

Soybean diseases cause major yield losses in Southern states. Average loss estimates from all pathogens exceeded ~~twenty~~ 17 per cent.

Soybeans and soybean products are very important U.S. agricultural commodity exports. In 1982, 2,276,976,000 bushels were harvested from 70,783,000 acres giving a national average of 32 bushels/acre. Southern states produced 31 percent of America's soybeans (711,475,000) on 39 percent of America's harvested soybean acreage (27,633,000 ~~bushels~~ A) giving an average of 25.7 bushels/acre. Acreage yields of each southern state in 1982 were as follows: Alabama, 27 bushels/acre; Arkansas, 24 bushels/acre; Delaware, 29 bushels/acre; Florida, 25 bushels/acre; Georgia, 27 bushels/acre; Kentucky, 30 bushels/acre; Louisiana, 26 bushels/acre; Mississippi, 26 bushels/acre; Missouri (8 southeastern counties), 29 bushels/acre; North Carolina, 26 bushels/acre; Oklahoma, 19 bushels/acre; South Carolina, 21 bushels/acre; Tennessee, 27 bushels/acre; Texas, 21 bushels/acre and Virginia, 25 bushels/acre.

## MATERIALS AND METHODS

The purpose of the SSDW Disease Loss Estimate Committee is to compile and record soybean disease loss estimates from southern states as the official disease loss statement on the production year. These disease loss estimates (Table 1) are annually solicited from Cooperative Extension Service and Experiment Station personnel in each southern state and are products of observations made in the field and laboratory. The disease loss estimates reported here were derived from IPM field monitoring programs, Regional Seedling, Nematode and Foliar Disease Control Trails, field observations, laboratory diagnosis, grower demonstrations and in one instance, remote sensing.

Total loss values listed in Tables 1 and 2 are weighted percentages of yield loss of each disease on each state's total production in bushels. Actual production figures for each state were supplied by the State Agricultural Statistician. Dollar losses in this report were calculated on a cost of 6.00 dollars per bushel times the estimated loss.

## RESULTS AND DISCUSSION

In 1982, soybeans produced in the South were subjected to intense disease pressure. The Cyst, Root-Knot and ecto-parasitic nematodes are reported to have caused a loss of over 35 million bushels resulting in losses over 200 million dollars. The soil diseases, which include seed, seedling, root and lower stem rots are reported to have caused a 30.99 million bushel loss, costing the growers 186 million dollars. Foliar pod and stem diseases are reported to have caused a production loss of 66.3 million bushels resulting in a $398 million loss. At $6.00 per bushel established as an average price received by soybean growers in the southern states, the 142,28 million bushels lost due to diseases cost growers an estimated $857 million. This compares to the 1981 estimate of $152 million bushels at $6.25 per bushel which resulted in a $952 million loss.

Total soybean disease loss in southern states during 1982 is estimated at 17.76 percent; the average disease loss for the previous five years being 21.27 percent. Florida reports the highest individual disease loss estimate of 43.0 percent. States reporting disease loss over 20 percent are Arkansas (26.5%), Louisiana (25.4%), Alabama (24.10%) and Tennessee (20.1%). Delaware reported the lowest loss of 1.0 percent.

Disease losses resulted in a loss of income to growers in Alabama of $79.98 million ($39.01/Acre); Arkansas $174.54 million ($37.94/Acre); Delaware $.48 million ($1.84/Acre); Florida $44.58 million ($74.92/Acre); Georgia $41.10 million ($15.80/Acre); Kentucky $53.22 million ($32.06/Acre); Louisiana $116.76 million ($39.57/Acre); Mississippi $122.28 million ($33.96/Acre); Missouri (8 southeast counties) $29.10 million ($23.70/Acre); North Carolina $34.20 million ($16.28/Acre); Oklahoma $4.62 million ($16.50/Acre); South Carolina $40.20 million ($23.50/Acre); Tennessee $76.38 million ($32.50/Acre); Texas $18.90 million ($21.00/Acre); and Virginia $17.64 million ($23.52/Acre).

Soybean diseases are important and warrant greater recognition. This is supported by the loss of 142 million bushels costing the soybean growers in the southern states over eight hundred and fifty million dollars. Expanded efforts are needed to provide more effective and economical control practices for these known disease problems.

TABLE 1. Estimated percent loss of soybean yields in 1982 as a result of disease damage

| DISEASE | AL | AR | DE | FL | GA | KY | LA | MS | MO (SE)* | NC | OK | SC | TN | TX | VA | Av Percent ** Dis Loss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seedling Disease | .10 | 2.50 | .00 | 5.00 | .10 | 1.20 | .20 | .50 | .00 | .20 | 3.00 | .75 | 2.00 | .75 | .20 | 1.10 |
| Root Rot & Stem Rots | 1.00 | 2.50 | .00 | 30.00 | .80 | 2.30 | 6.00 | 4.60 | TR | 1.20 | 1.50 | 1.00 | 3.00 | 2.00 | .30 | 3.75 |
| Diaporthe-Pod & Stem Blight | 1.00 | 4.00 | .00 | 2.50 | .30 | 1.00 | 8.00 | 2.20 | 1.00 | .50 | 1.00 | 2.00 | .20 | 3.00 | 3.00 | 1.91 |
| Anthracnose | 6.00 | 6.00 | .00 | 2.50 | 1.40 | 3.00 | 2.00 | 3.40 | 3.00 | .10 | 2.00 | 2.50 | 5.00 | 7.00 | .50 | 2.96 |
| Downey Mildew | TR | 1.00 | .00 | .50 | .01 | .01 | TR | TR | .00 | TR | TR | .25 | TR | TR | 1.00 | .18 |
| Cercospora Leaf Blight and Purple Seed Stain | 1.00 | 3.50 | .00 | 2.00 | .01 | .10 | TR | 2.50 | 1.00 | .10 | .50 | .75 | .20 | 2.00 | .80 | .96 |
| Brown Leafspot | 2.00 | .00 | .00 | .50 | .05 | 3.50 | TR | .20 | .50 | .50 | .00 | 1.00 | 4.00 | 1.00 | .10 | .89 |
| Bacterial Diseases | TR | TR | .00 | TR | .01 | .05 | TR | TR | .00 | .10 | .25 | .50 | TR | TR | .20 | .07 |
| Foliar Fungal Diseases (Others) | .00 | .00 | .00 | .00 | .00 | TR | 2.00 | .60 | .00 | .10 | .25 | 1.00 | TR | .75 | .00 | .31 |
| Cyst Nematodes | 3.00 | 3.00 | 1.00 | .00 | 1.50 | 3.00 | 4.00 | .50 | 7.00 | 3.50 | 1.75 | 1.50 | 3.50 | .15 | 1.00 | 2.29 |
| Root-Knot Nematodes & Ecto-Parasitic Types | 8.00 | .50 | .00 | .00 | 5.50 | .00 | 3.00 | .90 | .00 | 1.80 | 2.25 | 5.00 | .70 | TR | 4.00 | 2.11 |
| Virus Diseases | TR | 2.50 | .00 | TR | .10 | .80 | .10 | .10 | .00 | 2.00 | TR | .10 | TR | TR | 1.50 | .48 |
| Others | 2.00 | .00 | .00 | .00 | .00 | .00 | .10 | .90 | 1.00 | .50 | .00 | 2.25 | 1.50 | TR | 3.00 | .75 |
| Total Percent Loss | 24.10 | 26.50 | 1.00 | 43.00 | 9.78 | 14.96 | 25.40 | 16.40 | 13.50 | 10.60 | 12.50 | 18.60 | 20.10 | 16.70 | 15.60 | 17.76 |

* 8 counties in S.E. Missouri

** Average Percent Disease Loss = total weighted percent disease loss ÷ 15

TABLE 2. Estimated reduction of soybean yields in 1982 as a result of disease damage

| DISEASE | AL | AR | DE | FL | GA | KY | LA | MS | MO (SE)* | NC | OD | SC | TN | TX | VA | Total Bu Loss | Dollar loss x $10^6$** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seedling Disease | .05** | 2.76 | -- | 1.79 | .07 | .71 | .15 | .56 | -- | .11 | .18 | .27 | 1.27 | .14 | .04 | 8.10 | 48.60 |
| Root Rot & Stem Rots | .55 | 2.76 | -- | 4.46 | .56 | 1.36 | 4.60 | 5.15 | -- | .66 | .09 | .36 | 1.90 | .38 | .06 | 22.89 | 137.34 |
| Diaporthe-Pod & Stem Blight | .55 | 4.42 | -- | .37 | .21 | .59 | 6.14 | 2.46 | .36 | .27 | .06 | .72 | .13 | .57 | .57 | 17.42 | 104.52 |
| Anthracnose | 3.32 | 6.62 | -- | .37 | .98 | 1.78 | 1.53 | 3.81 | 1.10 | .05 | .12 | .90 | 3.17 | 1.32 | .09 | 25.16 | 150.96 |
| Downey Mildew | -- | 1.10 | -- | .07 | .01 | .01 | -- | -- | -- | -- | -- | .09 | -- | -- | .19 | 1.47 | 8.82 |
| Cercospora-Purple Seed Stain & Blight | .55 | 3.90 | -- | .30 | .01 | .06 | -- | 2.80 | .36 | .05 | .03 | .27 | .13 | .38 | .15 | 8.94 | 53.64 |
| Brown Leafspot | 1.11 | 1.10 | -- | .07 | .04 | 2.08 | -- | 2.24 | .18 | .27 | -- | .36 | 2.54 | .19 | .02 | 10.20 | 61.20 |
| Bacterial Diseases | -- | -- | -- | -- | .01 | .03 | -- | -- | -- | .05 | .02 | .18 | -- | -- | .04 | .33 | 1.98 |
| Foliar Fungal Diseases (Others) | -- | -- | -- | -- | -- | -- | 1.53 | .67 | -- | .05 | .02 | .36 | -- | .14 | -- | 2.77 | 16.62 |
| Cyst Nematodes | 1.66 | 3.12 | .08 | -- | 1.05 | 1.78 | 3.07 | .56 | 2.49 | 1.91 | .11 | .54 | 2.20 | .03 | .19 | 18.79 | 112.74 |
| Root-Knot Nematodes & Ecto-Parasitic Types | 4.43 | .55 | -- | -- | 3.85 | -- | 2.30 | 1.01 | -- | .98 | .14 | 1.80 | .44 | -- | .75 | 16.25 | 97.50 |
| Virus Diseases | -- | 2.76 | -- | -- | .07 | .47 | .07 | .11 | -- | 1.10 | -- | .04 | -- | -- | .28 | 4.90 | 29.40 |
| Others | 1.11 | -- | -- | -- | -- | -- | .07 | 1.01 | .36 | .20 | -- | .81 | .95 | -- | .56 | 5.06 | 30.36 |
| Total Disease Loss | 13.33 | 29.09 | 0.08 | 7.43 | 6.85 | 8.87 | 19.46 | 20.38 | 4.85 | 5.70 | .77 | 6.70 | 12.73 | 3.15 | 2.94 | 142.28 | 856.80 |
| Total Dollar Loss x $10^6$ | 79.98 | 174.54 | .48 | 44.58 | 41.10 | 53.22 | 116.76 | 122.28 | 29.10 | 34.20 | 4.62 | 40.20 | 76.38 | 18.90 | 17.64 | | |

* 8 counties in S.E. Missouri

**Dollar Loss = Estimated bushel loss X $6.00/bushel

Bu X $10^6$

TABLE 3. Southern States soybean disease loss estimate in bushels-dollars - 1982

| DISEASE | BUSHEL* LOSS x $10^6$ | DOLLAR LOSS x $10^6$ |
|---|---|---|
| Soil | | |
| Seedling | 8.10 | |
| Root & Lower Stem Rots | 22.89 | |
| SUB TOTAL | 30.99 | $185.94 |
| Nematodes | | |
| Cyst nematode | 18.79 | |
| Root-Knot & Other Nematodes | 16.25 | |
| SUB TOTAL | 35.04 | $210.24 |
| Foliar, Pod & Stem | | |
| Pod & Stem Blight | 17.42 | |
| Anthracnose | 25.16 | |
| Downey Mildew | 1.47 | |
| Cercospora | 8.94 | |
| Brown Leafspot | 10.20 | |
| Bacterial Diseases | 0.33 | |
| Other Foliar Fungi | 2.77 | |
| Virus | 4.90 | |
| Others | 5.06 | |
| SUB TOTAL | 76.25 | $457.50 |
| TOTAL | 142.28 | $853.68 |

* The bushel losses are compiled from percent loss estimates from each of 15 states estimated.

** The dollar loss is derived by multiplying bushels by $6.00/bushels.

2,160,000

# The Relationship Between Chloride Uptake and Leaf Scorch of Soybeans

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ABSTRACT

Leaf scorch caused heavy yield losses in 1980 and 1981 of certain soybean cultivars grown on poorly-drained flatwood soils of Georgia. The disorder was induced by KCl application in the field and results from a greenhouse study confirmed that leaf scorch was caused by Cl toxicity. Chloride levels in leaves and seed of 5 susceptible cultivars grown on a Cl problem field averaged 18 and 6 times greater, respectively, than that found in 10 tolerant cultivars. Tissue levels of Cl were positively correlated with leaf scorch ratings and negatively correlated with yield and seed weight. Leaf scorch of susceptible cultivars apparently is caused by Cl buildup from fertilizer containing Cl which has not been leached from these poorly-drained soils.

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*Person to present paper

Research Abstract

Southern Soybean Disease Worker's Conference

March 15-17, 1983

# Effect of No-Tillage on Fusarium Blight of Soybean on Delmarva

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Fusarium oxysporum causes a blight or wilt of soybeans that has occurred in Delmarva (the Delaware, Maryland, and Virginia peninsula) since 1976. Some growers have experienced severe yield losses while others have sustained only minor damage. However, the frequency and severity of the disease has been increasing and there is potential for widespread occurrence since the pathogen occurs in most soybean-growing areas.

Conversion from a conventional to no-tillage system may alter the disease situation because of complex interactions in the soil environment. A study was initiated in 1978 to determine if current no-tillage practices could be contributing to the Fusarium blight problem by altering the incidence of F. oxysporum in the soybean rhizosphere and root system.

Randomized, replicated plots were established at the University substation that included tillage vs no-tillage after wheat and barley for the cultivars 'Essex' and 'Williams'. Disease evaluations were made for Fusarium blight along with isolations from roots and rhizosphere soil utilizing a series of culture media selective for Fusarium. The study has been repeated each year with the identical location and design through the 1982 season.

Fusarium species were isolated significantly more often from rhizosphere soil collected from no-till vs till plots in 4 consecutive seasons. *Fusarium oxysporum* comprised 57% of all Fusarium species isolated and is an important component of the rhizosphere population. Pathogenicity of the *F. oxysporum* isolates was demonstrated in greenhouse tests. The pathogen was also isolated more frequently from roots of soybeans grown in no-till vs till plots and more frequently where wheat was the cover crop. Further, a greater number of seed harvested from plants grown in no-till plots carried *F. oxysporum* on the seed coat.

Results of this study indicate the definite trend for *F. oxysporum* to increase in the rhizosphere and root system of no-till soybean and emphasizes the potential threat of Fusarium blight when soybeans are grown continuously in the same location.

# EFFECTS OF NO-TILLAGE ON SOYBEAN CYST NEMATODES AND FOLIAR DISEASES

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## Abstract

Research was initiated in 1980 at the University of Tennessee Milan Experiment Station to compare population dynamics of the soybean cyst nematode (SCN) and crop injury and yields of soybeans double-cropped with wheat under no-tillage and conventional-tillage conditions. A susceptible soybean variety was planted in the plot area during 1980 to increase the existing SCN population. Wheat was seeded in the fall in plots to be double-cropped. 'Essex' soybean was planted in the spring of 1981 using no-tillage and conventional-tillage methods. SCN cyst levels increased three- to six-fold in plots planted conventionally while increases ranged from none to two-fold in no-tillage plantings. Yields were also significantly higher in no-tillage plots compared to conventional-tillage, double-cropped plantings.

Work was continued in the same plots in 1982. SCN cyst levels increased one and one-half to almost three times during the season on 'Essex' in conventional-tillage plots while there was no increase in no-tillage plots. Yields were again higher in no-tillage plantings.

Research on effects of no-tillage on foliar diseases was begun in the fall of 1979 with the seeding of wheat in plots that were to be double-cropped with soybeans. Soil sampling indicated the plot area to be free of cyst nematodes.

'Essex' soybean was planted both by no-tillage and conventional methods in the spring of 1980. Incidence of Septoria brown spot was lower in no-tillage plots than in conventional-tillage plots. Significantly less anthracnose was observed on pods in no-tillage plantings while more was observed on stems. Yields were slightly higher in no-tillage plots.

The work was continued in the same plot area in 1981 and 1982, and brown spot incidence was again lower on 'Essex' in no-tillage plots. Anthracnose injury was less on pods and greater on stems, and yields were higher in no-tillage plantings as in 1980.

# RESULTS FROM THE 1982 SSDW REGIONAL NEMATICIDE EVALUATION

Compiled By: Al Wrather, Nematicide Test Committee Chairman
Extension Plant Pathologist-University of Missouri

This test was conducted in ten states during 1982. The persons responsible for conducting this test by state were:

| | |
|---|---|
| Alabama | R. Rodgiquez-Kabana |
| Arkansas | Darell Widick |
| Florida | Bob Dunn |
| Georgia | Norman Minton |
| Louisiana | Ed McGawley |
| Mississippi | C. W. Laughlin and W. F. Moore |
| Missouri | Al Wrather |
| North Carolina | Don Schmitt |
| Oklahoma | Roy Sturgeon |
| Tennessee | Al Chambers and Melvin Newman |

These data from the individual states can't be analyzed together because of the differences in which the tests were conducted, and in the parasitic nematodes present in the test areas. The results from each test are presented in tables 1-10.

The number of white cysts, Heterodera glycines, on plant roots ca. 28 days after planting was significantly reduced by certain nematicides in the Arkansas, Louisiana, Missouri and Tennessee tests. In Missouri the reductions were greatest in areas tested with Soilbrom 90 and Temik 15G (Table 7). In Arkansas (Table 2) and Tennessee (Table 10) root ratings were significantly lower in all areas treated with a nematicide. In Louisiana (Table 5) Soilbrom 90 was the only treatment which significantly reduced the SCN root rating.

Root-knot damage was significantly reduced by Temik 15G at 1.0 lb. ai/acre and Soilbrom 90 at 1.5 gal/acre in the Louisiana test (Table 5), and by Soilbrom 90 at 1.5 gal/acre in the Georgia test (Table 4).

Soilbrom 90 at 1.5 gal/acre and Furadan 15G at 1.5 lb. ai/acre caused some phytotoxicity in the Mississippi test (Table 6). The damage apparently was transitory as there were no yield differences between any treatments.

Yields were significantly increased by certain nematicide treatments in the Alabama (Table 1), Louisiana (Table 5), Oklahoma (Table 9), and Tennessee (Table 10) tests. Soilbrom 90 at 1.0, 1.5, and 2.0 gal/acre increased yields in Alabama and 1.5 gal/acre increased yields in the other three states' tests. Furadan 15G at 1.5 lb. ai/acre and Oxamyl 10G at 1.0 lb. ai/acre treated areas yielded significantly more than untreated areas in the Tennessee test.

Certain nematicides did significantly affect the nematode populations in the soil and plant growth in various states' tests. The results from each states' tests follow.

TABLE 1. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN ALABAMA 1/

| Treatment | Lbs/ai/A | Method 2/ | Nematodes/250 cc Soil 3/ Root-Knot Larvae | Cyst Larvae | Subjective 4/ Rating | Yield/Bu/A |
|---|---|---|---|---|---|---|
| Control | - | - | 140 a | 1 b | 3.50 b | 6.29 d |
| Furadan 15G | 1.5 | In-F | 95 abc | 1 b | 3.75 b | 5.63 d |
| Temik 15G | 1.0 | In-F | 123 ab | 2 b | 4.13 b | 8.11 d |
| Oxamyl 10G | 0.5 | In-F | 72 bcd | 4 ab | 3.63 b | 6.41 d |
| Oxamyl 10G | 1.0 | In-F | 91 abc | 5 ab | 3.75 b | 7.08 d |
| Counter 15G | 1.0 | 8" Band | 139 a | 1 b | 3.88 b | 6.47 d |
| Counter 15G | 2.0 | 8" Band | 111 abc | 0 b | 4.00 b | 7.26 d |
| Counter 15G | 1.0 | In-F | 142 a | 1 b | 4.00 b | 10.47 d |
| Counter 15G | 2.0 | In-F | 68 bcd | 9 a | 4.00 b | 7.68 d |
| Amaze 20G | 2.0 | In-F | 119 ab | 0 b | 3.88 b | 7.80 d |
| Amaze 20G | 2.0 | 7" Band | 127 ab | 0 b | 4.13 b | 10.89 d |
| Soilbrom 90 gal/A | 1.0 | Knifed | 52 cd | 8 ab | 4.88 ab | 27.47 c |
| Soilbrom 90 | 1.5 | " | 77 abcd | 10 ab | 5.00 a | 36.48 b |
| Soilbrom 90 | 2.0 | " | 19 d | 15 a | 4.88 a | 41.93 a |

1/ This test was conducted at Elberta, Alabama in a sandy loam soil (O.M. < 1%). The 2 row (36") X 20 ft. long plots were planted on May 27, 1982. The soybean variety was Ransom. All treatments were replicated 8 times in a randomized complete block design. No phytotoxicity was noticed. The environmental conditions at planting were: soil temperature at 8" = 26° C, at 4" = 28° C; Air Temperature= 31° C; soil moisture ca. 60% F.C.; sunny, mild breeze. Rainfall was: June= 7.5"; July = 11.94"; August = 6.0"; September= 2.3"; October = 2.2.

2/ Knifed= the chemical was deposited 10" deep in the soil using 2 chisels/row set 8" apart. In-F= the chemical was deposited into the seed furrow during planting.

3/ Plots were sampled on October 7, 1982. Nematodes were extracted from these soil samples by a modified pie-pan technique. Root-knot larvae found were *Meloidogyne incognita* and *M. arenaria*.

4/ Subjective ratings made on August 11, 1982 were based on a scale of 1-5 where: 1= worst and 5= best overall plot appearance based on growth and color.

Means followed by the same letter are not significantly different.

TABLE 2. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN ARKANSAS 1/

| Treatment And Rate Per Acre | Application 2/ | SCN Cysts/250 cc Soil 3/ Preplant | Midseason | Harvest | Root Ratings 4/ | Yield (Bu/A) |
|---|---|---|---|---|---|---|
| Temik 15 G 1.0 lb ai | In-F | 74.2 a | 76.0 a | 50.0 ab | 1.0 c | 25.9 b |
| Soilbrom 90 1.5 gal. | Knifed | 72.2 a | 90.4 a | 63.6 a | 2.0 b | 24.0 b |
| Furadan 15 G 1.5 lb ai | In-F | 93.0 a | 76.0 a | 66.8 a | 2.0 b | 24.0 b |
| Oxamyl 10G 0.5 lb ai | In-F | 77.8 a | 81.6 a | 43.4 ab | 1.0 c | 24.7 b |
| Oxamyl 10G 1.0 lb ai | In-F | 63.4 a | 89.6 a | 57.4 a | 1.2 bc | 25.5 b |
| Check - | - | 65.0 a | 88.8 a | 51.8 a | 3.4 a | 25.3 b |
| Bedford - | - | 65.4 a | 66.8 a | 19.6 b | 1.0 c | 29.2 a |

1/ This test was conducted at Arkansas State University, Jonesboro, Arkansas in a silt loam soil. The 4 row (30") X 40' plots were planted on May 13, 1982. The variety Dare was used except for one treatment where Bedford was planted. The treatments were replicated 5 times in a randomized complete block design. Rainfall was adequate for plant growth throughout the year. Other pesticide used was: Treflan, ppi, at a recommended rate.

2/ Knifed= the chemical was injected into the soil just prior to planting with 1 knife per row at a depth of 8", In-F= the chemical was deposited into the seed furrow during planting.

3/ Preplant, midseason, and harvest samples were collected on 5/13, 6/16, 10/21 respectively. Cysts were extracted by water floatation.

4/ Root ratings made on June 13 were based on the average number of white and yellow cysts from 10 plants in each plot where: 0= no cysts on plant roots, 2= 11-20, 3=21-30, 4=31-40, 5=41-50, 6= 51-60, 7= 61-70, 8= 71-80, 9= 81-90, and 10= 91-100.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

TABLE 4. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN GEORGIA 1/

| Treatment | Rate/A | Application 2/ | Nematodes/250 cc Soil 3/ Root-Knot | Stubby Root | Spiral | Lesion | Ring | Root-Knot 4/ Index | Height (In.) | Lodge 5/ | Yield (Bu/A |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Furadan 15G | 1.5 lb ai | In-F | 1580.4 a | 348.2 bc | 2732.4 a | 24.4 a | 5.6 ab | 2.8 a | 40.2 a | 2.0 a | 44.3 ab |
| Temik 15G | 1.0 lb ai | In-F | 780.6 ab | 544.0 a | 2339.0 a | 24.6 a | 0.0 b | 1.9 b | 41.4 a | 2.2 a | 51.3 ab |
| Soilbrom 90 | 1.5 gal | Knifed | 21.8 b | 187.6 c | 30.0 b | 2.8 a | 0.0 b | 1.0 c | 41.0 a | 2.8 a | 54.5 a |
| Oxamyl 10G | 0.5 lb ai | In-F | 1118.2 a | 293.6 bc | 2220.4 a | 20.0 a | 5.6 ab | 1.8 b | 32.5 a | 9.2 a | 38.3 b |
| Oxamyl 10G | 1.0 lb ai | In-F | 768.3 ab | 469.0 ab | 2153.3 a | 13.7 a | 2.3 b | 2.4 ab | 40.0 a | 2.5 a | 48.9 ab |
| Control | - | - | 1520.0 a | 527.0 a | 2332.3 a | 24.0 a | 13.5 a | 2.5 ab | 37.5 a | 2.8 a | 48.0 ab |

1/ This test was conducted near the Coastal Plain Experiment Station at Tifton, Ge rgia in a Tifton loamy sand. The 4 row (38") X 20' long plots were planted on May 19, 1982. The soybean variet- was GaSoy 17. All treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Conditions at planting were: soil moisture= adequate; high soil temperature= 84° F; and low soil temperature= 70° F. Weather conditions throughout the growing season were very good. Other pesticides used were: Treflan ppi at 0.50 lb/A; Basagran postemerge at 0.50 lb/A; Lannate at 0.45 lb/A on 7/20 and 8/12; and Ambush + Methyl Parathion at 0.125 lb/A + 0.50 lb/A respectively on 8/31 and 9/21.

2/ Knifed= fumigant was placed 8" below the soil surface just prior to planting using 2 coulters/row spaced 10" apart; In-F= chemicals were deposited into the seed furrow during planting.

3/ Samples were collected on September 24, 1982. Nematodes were extracted from the soil by sugar floatation. Nematodes found were: Root-Knot= *Meloidogyne incognita*; Stubby Root= *Paratrichodorus christiei*; Spiral= *Helicotylenchus dihystera*; Lesion= *Pratylenchus brachyurus*; Ring= *Macroposthonia ornatus*.

4/ Root-knot indices where: 1= no galling, 2= 1-25%, 3= 26-50%, 4= 51-75%, and 5= 76-100% of roots galled.

5/ Lodging where: 1= no lodging, 2= light, 3= moderate, 4= heavy, and 5= very heavy lodging.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range test (P=0.05).

TABLE 5. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN LOUISIANA 1/

| Treatment | Rate (Gal. or lbs. A.I./A) | Method of 2/ Application | Seedling 3/ Stand Count | Root Rating 4/ SCN | Root-Knot | Yield (Bu/A) |
|---|---|---|---|---|---|---|
| Furadan 15G | 1.5 | In-F | 501 a | 3.0 a | 1.7 ab | 33.1 |
| Temik 15G | 1.0 | In-F | 527 a | 2.5 a | 1.1 b | 39.5 |
| Soilbrom 90 | 1.5 | Knifed | 546 a | 1.2 b | 0 b | 43.8 |
| Oxamyl 10G | 0.5 | In-F | 563 a | 2.9 a | 2.0 a | 35.2 |
| Oxamyl 10G | 1.0 | In-F | 478 b | 2.5 a | 1.8 a | 37.1 |
| Control | - | - | 658 a | 3.2 a | 2.6 a | 33.0 |
| | | | | | LSD = | 7.9 bu/A |

1/ This test was conducted at Dean Lee Agricultural Experiment Station, Alexandria, Louisiana in a Norwood silt loam soil. The 4 row (38") X 40' plots were planted on May 24. The soybean variety was Davis. All treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Other pesticides used were: Treflan + Lorox 4L ppi at 3 pts. and 1.5 pts/A respectively; 2,4-DB + Lorox post directed each at 1 pt/A; Lannate and Methyl Parathion applied by air at recommended rates; and Bravo 500 at a recommended rate. The environmental conditions throughout the season were adequate for plant growth.

2/ Knifed= the chemical was injected into the soil with 1-2 knives or coulters per row at a depth of 8-10 inches, In-F= the chemical was deposited into the seed furrow during planting.

3/ Stand counts were taken on July 6. Numbers represent the vigorous seedlings in the center two rows of each plot.

4/ Root ratings made on June 21, 1982 were based on a scale of 1-4 where: 1= mild disease symptoms and 4= severe.

5/ Plots were sampled for nematodes at preplant (May 23), midseason (August 18), and harvest time (October 19). Nematodes were extracted from the samples by using a semi-automatic elutriator and then sugar floatation.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

TABLE 5. (CONTINUED)

| Treatment | SCN Cysts/250 cc Soil 5/ Preplant | Midseason | Harvest | Reniform Larvae/250 cc Soil 5/ Preplant | Midseason | Harvest |
|---|---|---|---|---|---|---|
| Furadan 15G | 89.0 a | 478.5 a | 385.0 b | 34.5 b | 279.2 b | 658.4 a |
| Temik 15 G | 77.2 a | 525.8 a | 561.2 a | 110.0 a | 400.3 ab | 762.3 a |
| Soilbrom 90 | 127.5 a | 300.0 a | 459.6 a | 64.0 a | 257.1 b | 110.2 b |
| Oxamyl 10G | 103.8 a | 430.0 a | 1045.0 a | 59.3 a | 236.4 b | 257.1 b |
| Oxamyl 10 | 94.0 a | 314.5 a | 536.3 a | 82.5 a | 290.3 b | 115.0 b |
| Control | 136.5 a | 469.2 a | 744.5 a | 97.1 a | 458.5 a | 471.8 a |

| Treatment | Root Knot Larvae/250 cc Soil 5/ Preplant | Midseason | Harvest | Spiral/250 cc Soil 5/ Preplant | Midseason | Harvest |
|---|---|---|---|---|---|---|
| Furadan 15G | 42.1 a | 161.3 a | 293.8 ab | 96.5 a | 243.0 a | 604.7 a |
| Temik 15G | 29.1 a | 83.7 a | 172.4 bc | 203.8 a | 476.5 a | 665.3 a |
| Soilbrom 90 | 61.8 a | 43.6 b | 115.0 c | 61.0 a | 228.0 a | 381.5 a |
| Oxamyl 10G | 82.5 a | 137.2 a | 519.1 a | 101.8 a | 305.0 a | 426.9 a |
| Oxamyl 10G | 19.9 a | 81.4 a | 403.0 a | 61.0 a | 319.2 a | 561.0 a |
| Control | 35.8 a | 140.2 a | 274.1 ab | 88.0 a | 407.5 a | 522.5 a |

| Treatment | Stunt/250 cc Soil 5/ Preplant | Midseason | Harvest | Lance/250 cc Soil 5/ Preplant | Midseason | Harvest |
|---|---|---|---|---|---|---|
| Furadan 15G | 96.5 a | 236.2 a | 387.0 a | 6.0 a | 72.0 a | 82.5 a |
| Temik 15G | 83.0 a | 104.6 a | 261.5 a | 0.0 a | 60.5 a | 26.9 a |
| Soilbrom 90 | 72.5 a | 29.5 b | 111.5 a | 0.0 a | 49.5 a | 71.5 a |
| Oxamyl 10G | 17.0 a | 44.0 a | 100.0 a | 22.0 a | 11.0 a | 103.1 a |
| Oxamyl 10G | 22.0 a | 209.0 a | 249.1 a | 0 a | 11.0 a | 30.2 a |
| Control | 39.0 a | 215.8 a | 285.4 a | 5.5 a | 59.5 a | 82.5 a |

| Treatment | Ring/250 cc Soil 5/ Preplant | Midseason | Harvest |
|---|---|---|---|
| Furadan 15 G | 0 a | 0 a | 41.3 a |
| Temik 15G | 77.0 a | 21.6 a | 61.0 a |
| Soilbrom 90 | 0.0 a | 42.5 a | 231.0 a |
| Oxamyl 10G | 14.0 a | 0 a | 39.0 a |
| Oxamyl 10G | 0.0 a | 11.0 a | 137.5 a |
| Control | 12.3 a | 0 a | 236.5 a |

TABLE 6. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN MISSISSIPPI 1/

| Treatment | Rate/A | Application 2/ | Total Nematodes 3/ Per 250 cc Soil Preplant | Total Nematodes 3/ Per 250 cc Soil Midseason | Total Cyst Stages Per 250 cc Soil Preplant | Total Cyst Stages Per 250 cc Soil Midseason | Total Non-Cyst Per 250 cc Soil Preplant | Total Non-Cyst Per 250 cc Soil Midseason | Yield (Bu/A) | Phyto- 4/ toxicity |
|---|---|---|---|---|---|---|---|---|---|---|
| Furadan 15G | 1.5 lb ai | In-F | 1692.8 a | 4639.0 a | 36.2 a | 3812.8 a | 1656.6 a | 826.2 a | 30.6 a | M |
| Temik 15 G | 1.0 lb ai | In-F | 1067.6 a | 4841.2 a | 37.8 a | 4139.0 a | 1029.8 a | 702.2 a | 25.9 a | N |
| Soilbrom 90 | 1.5 gal | Knifed | 1332.2 a | 2123.6 a | 29.4 a | 1472.8 a | 1302.8 a | 650.8 a | 36.2 a | S |
| Oxamyl 10G | 0.5 lb ai | In-F | 1441.8 a | 2954.0 a | 11.6 a | 2207.4 a | 1430.2 a | 746.6 a | 26.5 a | N |
| Oxamyl 10G | 1.0 lb ai | In-F | 1989.4 a | 4216.6 a | 17.2 a | 2758.0 a | 1972.2 a | 1458.6 a | 30.8 a | N |
| Check | - | - | 604.0 a | 1730.2 a | 27.6 a | 1508.8 a | 576.4 a | 221.4 a | 24.9 a | N |

1/ This test was conducted at Lee County, Mississippi in a sandy loam soil. The 4 row (38") X 40' plots were planted on May 20, 1982 with the variety Essex. The treatments were replicated 5 times in a randomized complete block design. Moisture was adequate for good growth of plants throughout the season. Other pesticides used were: Lorox + Dual at 1 lb. + 2 lb. respectively, preemerge; and two applications of Blazer at 1 pt./A.

2/ Knifed= the chemical was infected into the soil with 1 knife per row at a depth of 6-8" just prior to planting time. In-F= the chemical was deposited into the seed furrow at planting time.

3/ Preplant and midseason samples were collected on May 19 and July 20 respectively. Nematode larvae and cysts were extracted from the soil with a semi-automatic elutriator. Cysts were incubated in a Baerman funnel for 7 days and then all hatched larvae were counted.

4/ Phytotoxicity ratings made on June 3 were based on seedling emergence and appearance where: N= none, S=slight delay in emergence and seedling development, M= moderate, interveinal and marginal necrosis, delayed development of 1st trifoliate and puckering of 1st trifoliate.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range test (P=0.05).

TABLE 7. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN MISSOURI 1/

| Treatment And Rate Per Acre | Application Technique 2/ | SCN Cyst Population 3/ Per 250 cc Soil: Preplant | SCN Cyst Population 3/ Per 250 cc Soil: Harvest | Cysts on 4/ Roots | Yield (Bu/A) |
|---|---|---|---|---|---|
| Soilbrom 90 1 gal | Knifed | 53.5 a | 82.8 cd | 2 d | 32.8 a |
| Soilbrom 90 1.5 gal | Knifed | 62.8 a | 86.8 cd | 1 d | 32.5 a |
| Soilbrom 90 2.0 gal | Knifed | 69.8 a | 117.8 abc | 1 d | 31.9 a |
| Furadan 15G 1.0 lb ai | In-F | 65.3 a | 95.8 cd | 22 a | 32.4 a |
| Furadan 15G 1.5 lb ai | In-F | 63.0 a | 125.5 ab | 23 a | 32.2 a |
| Furadan 4F 2 qt. | 12" Premerge | 60.5 a | 128.3 a | 15 b | 30.8 a |
| Temik 15G 0.5 lb ai | In-F | 78.3 a | 107.5 abcd | 7 cd | 29.6 a |
| Temik 15G 1.0 lb ai | In-F | 67.8 a | 95.8 cd | 5 cd | 32.8 a |
| Oxamyl 10G 5 lb | In-F | 65.8 a | 101.3 bcd | 15 b | 30.5 a |
| Oxamyl 10G 10 lb | In-F | 58.0 a | 103.7 bcd | 11 bc | 33.5 a |
| Control | - | 84.8 a | 116.3 abc | 24 a | 33.8 a |

1/ This test was conducted at Portageville, Missouri, in a sandy loam soil (1% O.M.). The 4 row (38") x 40' plots were planted on 5/28/82. The soybean variety was Forrest. The treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Rainfall was less than adequate during July, but adequate May-June and August-September. Other pesticides used were: Treflan at 1 qt/A ppi; and Basagran at 10 oz/A over-the-top.

2/ Knifed=the chemical was injected into the soil with 1 knife per row at a depth of 8" just prior to planting, In-f= the chemical was deposited into the seed furrow during planting, 12" preemerge= a 12 inch wide band of the chemical was sprayed onto the bed immediately after planting.

3/ Preplant and harvest samples were collected on 5/28 and 10/18 respectively. Cysts were extracted from the soil by using a semi-automatic elutriator.

4/ Average number of white and yellow cysts on plant roots 28 days after planting (June 28).

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

TABLE 8. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN NORTH CAROLINA 1/

| Treatment | Rate/Acre | Applic. 2/ | Nematodes/250 cc Soil Preplant 3/ Root-Knot | Lesion | Stunt | Spiral | Stubby Root | Dagger | Ring | Cyst Juv. | Cyst | Egg | Yield (Bu/A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Furadan 15G | 1.5 lb ai | In-F | 11.0 a | 12.0 b | 72.0 a | 14.0 a | 5.0 ab | 21.0 a | 38.0 a | 71.0ab | 35.8a | 2710ab | 31.3 c |
| Temik 15G | 1.0 lb ai | In-F | 9.0 a | 11.0 b | 138.0a | 3.0 a | 4.0 b | 11.0 a | 28.0 a | 49.0 b | 27.4a | 3200ab | 35.5 c |
| Soilbrom 90 | 1.5 gal | Knifed | 29.0 a | 17.5 ab | 85.8a | 7.5 a | 7.5 ab | 15.8 a | 43.0 a | 138.3a | 35.3a | 2320ab | 39.2 b |
| Oxamyl 10G | 0.5 lb ai | In-F | 4.0 a | 4.0 b | 105.0a | 11.0 a | 4.0 b | 6.0 a | 6.0 a | 39.0b | 32.4a | 3760ab | 33.6 c |
| Oxamyl 10G | 1.0 lb ai | In-F | 5.0 a | 6.0 b | 72.0a | 13.0 a | 6.0 ab | 3.0 a | 13.0 a | 36.0b | 40.2a | 5380a | 33.7 c |
| Check | - | - | 8.0 a | 26.0 a | 153.8a | 7.5 a | 13.8 a | 16.3 a | 55.0 a | 28.8b | 9.2a | 3090ab | 33.7 c |
| Centennial | - | - | 35.0 a | 9.0 b | 49.0a | 10.0 a | 5.0 ab | 16.0 a | 47.0 a | 37.0b | 14.6a | 2330ab | 45.8a |

1/ This test was conducted in Greene County North Carolina in a sandy loam soil. The 4 row (36") X 40' long plots were planted on May 10, 1982. The soybean variety was Coker 156 except for one treatment which was Centennial. All treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Rainfall was adequate for good plant growth throughout the year except for a brief drought period during the last of August and the first of September. Other pesticides used were: Lasso, 2 qt/acre, preemerge; Blazer, recommended rate, over-the-top.

2/ Knifed= fumigant was placed 10" below the soil surface using 1 knife/row just prior to planting. In-F= chemical was deposited into the seed furrow during planting.

3/ Preplant & midseason samples were taken on May 10 and August 4. Nematodes were extracted from the soil by semi-automatic elutriator and then centrifugation floatation. Nematodes found were: Root-knot= *Meloidogyne incognita*; lesion= *Pratylenchus brachyurus* + *P. zeae*; stunt= *Tylenchorhynchus claytoni*; spiral= *Helicotylenchus dihystera*; stubby root= *Trichodorus minor*; dagger= *Xiphinema* sp.; ring= *Criconemella ornatum*.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

TABLE 8. (CONTINUED)

| | | | Nematodes/250 cc Soil Midseason | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Cyst | | |
| Treatment | Rate/Acre | Applic. | Root-Knot | Lesion | Stunt | Spiral | Stubby Root | Dagger | Ring | Juv. | Cyst | Egg |
| Furadan 15G | 1.5 lb ai | In-F | 16.0 a | 8.0 a | 74.0 a | 58.0 a | 12.0 a | 16.0 a | 10.0 a | 106 a | 56 ab | 2420 a |
| Temik 15G | 1.0 lb ai | In-F | 2.0 a | 6.0 a | 44.0 ab | 16.0 a | 6.0 a | 8.0 a | 12.0 a | 56 ab | 52 ab | 2120 a |
| Soilbrom 90 | 1.5 gal | Knifed | 0.0 a | 2.0 a | 2.0 b | 4.0 b | 16.0 a | 0.0 a | 8.0 a | 52 ab | 55 ab | 2140 a |
| Oxamyl 10G | 0.5 lb ai | In-F | 0.0 a | 2.0 a | 56.0 ab | 2.0 b | 8.0 a | 2.0 a | 2.0 a | 102 a | 67 ab | 2520 a |
| Oxamyl 10G | 1.0 lb ai | In-F | 4.0 a | 0.0 a | 36.0 ab | 30.0 ab | 8.0 a | 2.0 a | 6.0 a | 70 ab | 84 a | 3440 a |
| Check | - | - | 0.0 a | 4.0 a | 32.0 ab | 26.0 ab | 2.0 a | 2.0 a | 12.0 a | 64 ab | 55 ab | 2720 a |
| Centennial | - | - | 0.0 a | 6.0 a | 12.0 ab | 8.0 ab | 2.0 a | 8.0 a | 12.0 a | 26 b | 17 b | 940 a |

TABLE 9. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN OKLAHOMA 1/

| Treatment | Rate/Acre | Applic. 2/ | Heterodera glycines cyst/250 cc soil 3/ | | | Heterodera 4/ larvae/g root | | Root 5/ | Lesion larvae/250 cc soil 3/ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preplant | Midseason | Harvest | Midseason | Harvest | Rating | Preplant | Midseason | Harvest |
| Furadan 15G | 1.5 lb ai | In-F | 21.6 ab | 298.4 a | 346.4 ab | 86.6 a | 38.6 a | 1.2 b | 2.4 a | 24.8 ab | 59.2 a |
| Temik 15G | 1.0 lb ai | In-F | 51.2 a | 276.0 a | 245.6 ab | 127.8 a | 5.2 a | 2.4 ab | 4.8 a | 31.2 ab | 36.8 a |
| Soilbrom 90 | 1.5 gal | Knifed | 40.0 ab | 223.2 a | 885.6 a | 29.8 a | 23.0 a | 2.0 b | 12.0 a | 45.6 a | 72.0 a |
| Oxamyl 10G | 1.0 lb ai | In-F | 30.4 ab | 187.2 a | 584.8 ab | 166.6 a | 21.2 a | 4.4 a | 4.8 a | 23.2 ab | 64.0 a |
| Oxamyl 10G | 0.5 lb ai | In-F | 40.8 ab | 180.8 a | 521.6 ab | 161.8 a | 20.6 a | 2.0 b | 4.0 a | 19.4 ab | 63.2 a |
| Counter 15G | 8 oz. | In-F | 26.4 ab | 379.2 a | 208.0 b | 40.0 a | 17.6 a | 3.0 ab | 9.6 a | 15.2 b | 56.0 a |
| Counter 15G | 16 oz. | In-F | 29.6 ab | 260.8 a | 478.4 ab | 29.8 a | 7.8 a | 2.0 b | 9.6 a | 25.6 ab | 23.2 a |
| Check | - | - | 17.6 ab | 285.6 a | 144.8 b | 35.6 a | 19.6 a | 1.4 b | 9.6 a | 13.6 b | 29.6 a |

1/ This test was conducted at Vian, Oklahoma on a Lonok loam soil. The 4 row (36") X 40' long plots were planted on May 27, 1982 except the Furadan 15G treatment which was planted on June 22, 1982. The soybean variety was Dare. All treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Rainfall for the growing season was: June= 6.97", July= 3.3", August= 2.0", September= 1.2". Other pesticides used were: Treflan ppi at a recommended rate.

2/ Fumigant was placed 8" below the soil surface using 1 knife per row just prior to planting. In-F= chemical was deposited in the seed furrow during planting.

3/ Preplant, midseason and harvest soil samples were collected on May 27, July 15, and September 20 respectively. Nematodes were extracted from the soil by a modified Seinhorst quick method. Lesion nematode=*Pratyleuchus* sp.

4/ Midseason and harvest root samples were collected on July 15 and September 20 respectively. Nematodes were extracted from the roots by incubating them in aerated water for 7 days.

5/ Root ratings made on July 15, 1982 were based on the average number of white cysts from 10 plants/plot where: 0= no cysts; 1= 1-10; 2= 11-20; 3= 21-30; 4=31-40; 5=41-50; 6=51-60; 7= 61-70; 8= 71-80; 9=81-90; 10=91-100.

6/ Growth ratings made on July 15, 1982 represent appearance of the plants in the plots where: 1= stunted plants and 10= vigorously growing plants.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

TABLE 9. (CONTINUED)

| Treatment | Rate/Acre | Lesion larvae/gm root 4/ Midseason | Harvest | Growth 6/ Rating | Yield (Bu/A) |
|---|---|---|---|---|---|
| Furadan 15G | 1.5 lb ai | 77.2 a | 22.0 a | 8.0 a | 34.6 ab |
| Temik 15G | 1.0 lb ai | 48.2 a | 12.0 a | 8.0 a | 37.8 ab |
| Soilbrom 90 | 1.5 gal | 61.6 a | 20.6 a | 8.0 a | 44.1 a |
| Oxamyl 10G | 1.0 lb ai | 199.4 a | 34.8 a | 6.6 ab | 37.8 ab |
| Oxamyl 10G | 0.5 lb ai | 144.8 a | 48.8 a | 6.0 bc | 39.2 ab |
| Counter 15G | 8 oz. | 47.0 a | 19.2 a | 6.8 ab | 37.9 ab |
| Counter 15G | 16 oz. | 38.0 a | 13.8 a | 7.4 ab | 38.5 ab |
| Check | | 71.8 a | 51.0 a | 5.0 c | 33.4 b |

TABLE 10. RESULTS OF THE 1982 SSDW REGIONAL NEMATICIDE TEST IN TENNESSEE 1/

| Treatment | Rate/Acre | Applied 2/ | Soybean Cyst Nematode/250 cc Soil 3/ Preplant Cysts | Preplant Larvae | Midseason Cysts | Midseason Larvae | Harvest Cysts | Harvest Larvae | Root Rating 4/ | Plant Vigor 5/ Rating July | Plant Vigor Rating October | Yield (Bu/A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Furadan 15G | 1.5 lb ai | In-F | 71.0 a | 14.0 b | 60.0 a | 32 a | 94.0 ab | 56.0 a | 3.8 b | 9.3 a | 9.4 a | 35.6 a |
| Temik 15G | 1.0 lb ai | In-F | 71.0 a | 36.0 ab | 55.0 ab | 72 a | 63.0 b | 72.0 a | 0.8 c | 9.5 a | 9.6 a | 32.6 ab |
| Soilbrom 90 | 1.5 gal | Knifed | 68.0 a | 28.0 ab | 26.0 b | 54 a | 128.0 a | 68.0 a | 0.3 c | 9.4 a | 9.5 a | 37.5 a |
| Oxamyl 10G | 0.5 lb ai | In-F | 58.0 a | 50.0 a | 49.0 ab | 112 a | 97.0 ab | 32.0 a | 1.8 c | 9.4 a | 9.5 a | 34.6 ab |
| Oxamyl 10G | 1.0 lb ai | In-F | 71.0 a | 24.0 ab | 42.0 ab | 22 a | 76.0 ab | 32.0 a | 1.4 c | 9.5 a | 9.5 a | 36.2 a |
| Check | - | - | 50.0 a | 18.0 ab | 67.0 a | 48 a | 125.0 a | 44.0 a | 6.5 a | 7.9 b | 7.6 b | 27.5 b |

1/ This test was conducted at Jackson, Tennessee in a Falaya silt loam soil. The 4 row (38") X 30' plots were planted on June 2, 1982. The soybean variety was Essex. All treatments were replicated 5 times in a randomized complete block design. No phytotoxicity was noticed. Other pesticides used were: Seed treated with Pro-Treat L at 6 fl. oz./bu.; and Treflan 3 pt/A ppi. Rainfall during the test period was: June = 3.73"; July= 6.69"; August= 2.90"; September= 2.30"; and October 1-11= 0.79". Soil samples for nematode counts and harvest yields were taken from the middle two rows of each plot, and the cyst on root rating was taken from plants in outside two rows of each plot. Conditions at planting were: partly cloudy; high temperature 80° F; and 2-3 mph wind.

2/ Knifed= The chemical was injected into the soil 8" deep and 1-2" to the side of the seed furrow with 1 knife per row. In-F= the chemical was deposited into the seed furrow during planting.

3/ Preplant, midseason, and harvest samples were taken on June 2, July 16, and September 30 respectively. Extraction by elutriato and sugar floatation.

4/ Cyst ratings made on July 1 were based on the number of white and yellow cysts from 10 plants in each plot where: 0= no cysts on roots; 1= 1-10; 2= 11-20; 3= 21-30; 4= 31-40; 5=41-50; 6=51-60; 7= 61-70; 8= 71-80; 9=81-90; and 10= 91-100.

5/ Plant vigor ratings were made on July 8 and October 8 based on the overall appearance of each plot where 1= plants dead to 10= plots with vigorous, uniform plants.

Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

RESEARCH ON THE EFFECTS OF ECTOPARASITIC NEMATODES ON SOYBEAN YIELDS.

E. C. McGAWLEY, G. T. BERGGREN, AND K. L. WINCHELL. Dept. of Plant Pathology & Crop Physiology, Louisiana State University, Baton Rouge 70803

Previous estimates of damage to Louisiana soybeans incited by plant parasitic nematodes have focused almost exclusively on that caused by the soybean cyst (SCN), root-knot (RK), and reniform (REN) nematodes. The objectives of laboratory, greenhouse, and field research conducted during the last 2½ years have been to identify nematode genera and species commonly associated with La. cultivars, to evaluate their individual and combined ability to incite yield loss, to monitor species and races of SCN, RK, and REN, and to evaluate the interactive potential of nematodes and common fungal pathogens of soybean. One hundred seventeen fields, representing 6 of 14 major soybean producing parishes were sampled and 11 genera and 20 species of nematodes identified. In order to test the susceptibility of 15 cultivars recommended for use in La., these nematode species were increased individually in a greenhouse on soybean and used to inoculate single 10-day-old seedlings. Yields of field plots initially infested with 50,000 nematodes (2,423 *Xiphinema americanum*, 4,131 *Hoplolaimus galeatus*, 6,880 *Tylenchorhynchus cylindicus*, 11,385 *Criconemoides* [mixed species], 8,415 *Helicotylenchus dihystera*, 6,299 *Meloidogyne incognita*, and 9,625 *Rotylenchulus reniformis*) were significantly reduced below those of control plots which were either uninfested or infested and treated with a nematicide. Benomyl was applied at $R_3$ and again at $R_5$ in both Nemacur treated and untreated plots, although significant yield increases (P=0.05) were observed only in plots treated with both Benomyl and Nemacur. SCN race determination tests indicate that race 3 is most common, race 4 is present, race 2 is rare and race 1 has not been detected. *Meloidogyne incognita* and *M. arenaria* are both found associated with soybean, the former more so than the latter.

Relationship of Numbers of the Soybean Cyst Nematode and Soybean Crop Response in North Carolina

D. P. Schmitt
Department of Plant Pathology
N. C. State University
Raleigh, NC 27650

The soybean cyst nematode, Heterodera glycines, is an important pest of soybeans. This nematode has a capacity to cause an almost complete loss of the crop. It is known in 22 states which comprises most of the soybean producing states in the USA. The increased and intensified usage of resistant varieties has resulted in major shifts in races. These shifts have been largely race 1 to 2 or race 3 to 4. It is necessary to characterize the effects of the races in different soils. Four soils (sand, loamy sand, sandy clay loam, and muck) were fumigated with methyl bromide and then infested with 0, 10, 100, 1,000, or 10,000 eggs of races 1 and 2/500 $cm^3$ soil. A susceptible soybean (Ransom) was planted in all plots. Races 1 and 2 caused severe damage in all soil types tested. The relationship of egg numbers to crop damage in the sand and loamy sand soils was linear. In the sandy clay loam soils of the piedmont and high organic soils (muck) of the tidewater area, there was curvilinear relationship in which approximately 1,000 eggs/500 $cm^3$ of soil of both races were required to cause damage. Growers farming on sandy to sandy loam soils should benefit economically by using control tactics when they find almost any number of soybean cyst nematodes in the field, whereas growers in the piedmont or the tidewater area will not have to use any control tactic until they recover 1,000 or more eggs/500 $cm^3$ soil.

LEVEL OF RESISTANCE TO CYST NEMATODES IN DERIVED LINES OF SOYBEANS. S. C. Anand and C. R. Shumway, Department of Agronomy, University of Missouri-Columbia, Portageville, MO 63873

Soybean cyst nematode (SCN) *Heterodera glycines* Ichinohe is a major pest of soybeans in the eastern and southern United States. 'Peking' and PI 88788 are two of the major sources of resistance which have been extensively used by the plant breeders to develop resistant varieties. 'Custer', 'Pickett 71', and 'Forrest' derived their resistance to races 1 and 3 from Peking. Similarly, 'Bedford', 'Nathan', D75-10710, and S77-281 derived their resistance to race 4 from PI 88788. The object of this study was to compare the level of resistance in derived lines with the donor parent and see whether full complement of resistance to SCN was transferred. The derived lines along with their donor parent were inoculated with 1000 eggs of selected SCN cultures. The level of resistance or susceptibility was determined by the presence of white females on the roots of each plant 30 days after inoculation. The results indicated that, in general, Custer, Pickett 71, and Forrest had more cysts per plant compared with those on Peking. On these three, Custer seems to be slightly less susceptible against two of the four cultures. Similarly, Bedford, Nathan, D75-10710 and S77-281 were found to be less resistant than their donor PI 88788, because of greater number of cysts present on their roots. Since resistance to SCN is multigenic, it is evident that the full gene complements for resistance was not transferred from the donor parents to the derived lines included in the present study.

REDUCTION OF SOYBEAN CYST NEMATODE FEMALES BY FURADAN. A.J. Howard, Research Biologist, FMC Corporation, Box 480, Marion, Arkansas 72364

FMC data are available to show the mode of action of Furadan (Carbamate-insecticide/nematicide) against the soybean cyst nematode (Heterodera glycines). The studies indicate that in addition to the nematicidal properties of Furadan, Furadan also inhibits root feeding by the nematodes. Therefore, the majority of soybean cyst nematode larvae in the infective stages are prevented from attacking the soybean roots and thus, the number of females on the roots are reduced. Data from studies in both the lab and the field following significant posttreatment intervals may show that soybean cyst nematode free larvae are present in high numbers in the soil of plots treated with Furadan, but appear in very small numbers when counts of females are taken on the soybean roots. On the other hand, untreated plots show fewer free larvae in the soil and a greater number of females on the roots. Results from these studies show that Furadan not only provides nematicidal activity, but appears to inhibit the attack of soybean cyst nematode larvae, thus reducing the number of females that feed and reproduce on the roots.

R. D. Riggs and L. R. Oliver

## The Effect of Trifluralin (Treflan) on Soybean Cyst Nematode

Silt-loam soil infested with Heterodera glycines (SCN) was collected from the Cotton Branch Experiment Station (CBES), Marianna, Arkansas, in the winter of 1981. Soil to fill a 15.4 cm - diameter clay plot was mixed with trifluralin (Treflan) at a 0.84 kg/ha rate or left untreated (check). Each treatment was replicated 8 times. Three replications were processed by the roiling and sieving - Baermann funnel method 5 days after treatment for the recovery of SCN second stage juveniles (L2). The remaining five replications were sieved 35 days after treatment for the recovery of mature SCN. Five times as many L2 were recovered from the Treflan treated soil compared to the untreated check. The number of mature SCN recovered did not differ by treatment, however, the root systems from Treflan-treated soil were much more deteriorated than those roots from check plots. In 1982, 0.42 and 0.84 kg/ha of Treflan added to the silt-loam soil from CBES increased the L2 count 3.6 and 4.1 times, respectively when compared to the untreated check. A Treflan treatment of a fine sandy-loam soil failed to elicit the same response.

Field response of SCN due to Treflan and Metolachlor (Dual) was tested on the CBES silt-loam soil in 1981. Treflan treated plots had more than twice and six times as many L2 recovered at 2 and 6 weeks after treatment, respectively, when compared to untreated check plots. On plots treated with Dual (3.4 kg/ha), L2 recovery was (1.2X) at 2 weeks and (6.6X) at 6 weeks after treatment when compared to check plots.

Treflan and Dual applications to silt loam soil resulted in increased recovery of L2 of soybean cyst nematodes 2 and 6 weeks later. The effect of the herbicides was related to soil type.

EFFECT OF THREE DENSITIES OF THREE MELOIDOGYNE SPECIES ON SOYBEAN GROWTH IN NORTH FLORIDA. C. H. Opperman* and R. A. Dunn, Dept. of Entomology and Nematology, U. of Florida, Gainesville, FL 32611

The effects of three initial densities (1, 3 and 6 eggs and/or second stage juveniles per $cm^3$ of soil) of *Meloidogyne incognita*, *M. arenaria*, and *M. javanica* on soybean [*Glycine max* (L.) Merr.] were investigated in field microplots in 1982. Two soybean genotypes were used for comparison: FL77-1797 (expected to be resistant and/or tolerant to all three *Meloidogyne* species) and 'Coker 338' (susceptible and sensitive to all three *Meloidogyne* species). Numbers of pod per plant were determined as one measure of the plants response to the nematodes. Soil samples were collected at 30, 85, and 162 days after seeding and root-galling was rated at 85 days. There was significant negative correlation between pod set and root-gall rating for all three species of *Meloidogyne* on both genotypes. Pod set on FL77-1797 was 28-55% and 1-21% less with *M. javanica* and *M. arenaria*, respectively, than with comparable inoculem levels of *M. incognita*. Pod set on 'Coker 338' was negligible when inoculated with all *Meloidogyne* species. Early season populations of *Meloidogyne* species did not differ significantly, but by 85 days after planting, *M. arenaria* populations were 50-100% greater than *M. incognita* and *M. javanica* on FL77-1797; *M.* incognita populations were 100% greater than those of *M. arenaria* and M. *javanica* on 'Coker 338.'

EFFECTS OF PRATYLENCHUS BRACHYURUS ON YIELD COMPONENTS OF SOYBEANS.
S. R. Koenning, Dept. of Plant Pathology, N. C. State University, Raleigh, NC 27650.

Microplot experiments were conducted in 1981 and 1982 to determine the effects of planting date and wheat on the population dynamics of Pratylenchus brachyurus and their interaction on the yield of the susceptible cultivar Forrest at two locations. Soybean yields and plant height were reduced both years ($P = 0.01$) by the nematode at the Border Belt Tobacco Research Station (BBTRS), Whiteville, NC. At the Central Crops Research Station (CCRS), Clayton, NC, plant height and yields were not reduced in 1981 but were reduced ($P = 0.01$) in 1982 by this pest. There were fewer nodes on the main stem of plants grown in nematode infested plots at both locations in 1982. The crop phenology was also slightly altered, the primary effect being a shorter reproductive period. In the fall of 1981, half of the replications were planted to wheat while the remaining replications were left fallow. Soybean yields were reduced ($P = 0.08$) at BBTRS but not at CCRS. While nematode numbers were reduced in plots planted to wheat ($P = 0.05$) at BBTRS this had no effect on subsequent soybean yield. A field experiment was conducted in 1982 near Raeford, NC to validate previous greenhouse and microplot results. The greatest yield occurred with nonnematicide treated Essex (a tolerant cultivar). All nematicide treatments increased the yield of Forrest (a susceptible cultivar) and reduced nematode number. P. brachyurus is pathogenic to soybean and causes significant damage which justifies the implementation of control tactics. A wheat/soybean double-cropping system can be expected to reduce soybean yield loss from this pest because of delayed planting time of soybean.

POD AND SEED INFECTION BY *PHOMOPSIS SP.* DURING SOYBEAN SEED DEVELOPMENT AND MATURATION.

J. R. Hicks*, L. J. Tomes and D. M. TeKrony, Dept. of Agronomy, University of Kentucky, Lexington 40546.

Pods and seed were collected from soybean (cv. Williams) field plantings at various development stages and assayed for Phomopsis sp. infection in 1981 and 1982. Pod collections began at growth stage R5 (beginning seed), seed collections began at R6 (full seed), and both continued through R8 (95% brown pods). Between growth stages R6 and R7 (one brown pod on main stem), intermediate collections were made as pod color changed from green to yellow to brown. At each collection, a disk was removed from the locular cavities of one carpel of each pod. Locular disks, the remainder of the carpel, and corresponding seed were plated on PDA (pH 4.5) to determine Phomopsis sp. infection. The second carpel was retained for K analysis. In 1981, pod infection was 75% at R5 and increased to 100% at R7. Disk infection at R6 was 40% lower than pod infection, but increased proportionally to pod infection at later growth stages. Movement of the fungus from pods to seed occurred at physiological maturity (R7) and increased to greater than 70% by harvest maturity (14% seed moisture). In 1982 Phomopsis sp. infection showed similar trends to 1981. Benomyl treated plants had reduced Phomopsis sp. infection and higher K levels than the check in 1982.

## NEW DEVELOPMENTS

Greg Rich, Chevron Chemical Company, Presiding

Label Amendments for Furadan in Soybeans - William S. Hough, FMC Corporation

Summary of Super Tin 4L for Performance on Soybeans for Foliar Disease Control - Edwin F. Koldenhoven, Griffin Corporation.

Sudden Death Syndrome of Soybean - A Disease of Unknown Etiology - Marc Hirrel, University of Arkansas

# REPORT OF SOUTHERN SOYBEAN DISEASE WORKERS
# SEED TREATMENT COMMITTEE - 1982

Compiled by M. C. McDaniel, Chairman
Extension Plant Pathologist
University of Arkansas
P. O. Box 391
Little Rock, AR 72203
Phone (501) 373-2641

Seedling diseases, rapidly increasing in recent years, and low seed quality constitute a major limiting factor of soybean production in the southern United States. With the continually increasing production costs (fuel, seed, labor, etc.) incurred by soybean producers throughout the nation, maximum yields are required to offset these inflated costs. Thus, the soybean producer must, through proper management including good pest management, achieve maximum yields while holding production costs to a minimum. The relatively inexpensive use of soybean seed treatments should be a major consideration of every soybean producer. The significance of soybean seed treatments in soybean production has become more important due to the increasing seedling disease problem, high cost of seed, use of the airflow and plateless planters, availability of customized seed-cleaning and seed-treating services, and the relatively new on-farm seed treaters and liquid hopperbox formulations.

The University Research and Cooperative Extension Service, along with the agricultural chemical industry and farm equipment manufacturing companies, have a common goal of increasing agricultural productivity through the development of new and better farm machinery, more effective agricultural chemicals and the development and grower implementation of research proven practices. It is in this regard that the Southern Soybean Disease Workers sponsor the only uniform nationwide seed treatment testing program in existence today.

## SEED:

Seed of the soybean cultivar, Forrest (certified), were donated by SFA (Southern Farmers Association, North Little Rock, Arkansas). Random samples were taken from each of the bags for germination determination. The results of this test, conducted by the Arkansas State Plant Board, revealed an 82 percent germination and 72 percent vigor rating. This made a good source of seed for a seed treatment test as most plant pathologists recommend seed treatment if germination is below 80 to 85 percent. Dr. Marc C. Hirrel, Research Plant Pathologist, University of Arkansas at Monticello, made fungi isolations from part of the sample used to determine germination. The major organisms and percents were Phomopsis 8, Alternaria spp 7, Cercospora kikuchii 1, Fusarium spp 2, and unidentified fungi 18, percent respectively. This was a somewhat lower incidence of seed-borne organisms compared with previous years.

## FUNGICIDES:

The 1982 soybean treatment trials included 20 candidate fungicides plus Terra-Coat L-205 as a standard treatment and an untreated check. The fungicide treatments were applied to 10 pounds of seed for each fungicide in a rotating drum treater by the chairman of the seed treatment committee. The exact amount of liquid or flowable material was atomized directly into the tumbling seed in the rotary-treater and allowed to tumble for two minutes. The wettable powder formulations were mixed with water, 1 percent by weight, and atomized on the tumbling seed while slurry treatments were mixed with water (1:1 wt/vol) and atomized onto the seed as before.

EXPERIMENTAL PROCEDURE:

Following chemical application and air drying, the seed were packaged in heavy paper bags and this bag sealed in a plastic bag to prevent contamination. The seed packages were then packaged for shipment to cooperators. The test consisted of five replications in three row plots, 40 feet long, and suggested 38 inch row spacing. Stand and yield data was taken from the center-three row plot. This prevented any border effects. A planting rate of 240 seed per 40 foot or 6 seed per foot of row was attempted. This seeding rate has been used successfully for 5 years and will become standard. A reduction in seeding rate by treatment should be a high objective in chemical seed treatment.

Changes recommended by the Seed Treatment Committee (Reid Faulkner - Olin Corporation, Sid Stephens, Southeast Distributors Incorporated and myself) and approved by the Executive Committee were as follows:

1. Continue with seeding rate of 6 seed per foot.

2. Nomination of candidate treatments be made no later than the annual meeting, preferably earlier. Limitation of 2 entries per company when maximum number of treatments is requested.

3. Chemicals be supplied to chairman no later than April 10.

4. Stand count data must be received from cooperator no later than August 1 and yield data by December 1.

5. Companies that submit a candidate material and then cancel must pay the entry fee regardless.

6. The entry fee of $750 per entry be increased to $1,000 beginning in 1983 and be paid when candidate nominations are accepted by the chairman.

RESULTS:

For 1982, fourteen states agreed and participated in the Southern Soybean Disease Workers uniform seed treatment trials; Arkansas, Alabama, Florida, Georgia, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Tennessee, Texas and Virginia (2). All states, except Oklahoma, which lost their test due to herbicide drift, completed their test and supplied stand survival and yield data as the objective stated.

As in past years, there was more difference in stands than in yields. Also, no particular treatment was a top performer in all trials indicating a variation in pathogens and environmental conditions.

Planting dates ranged from May 11 to June 17 and harvest from October 17 to November 16. Major soil-borne organisms were Rhizoctonia and Fusarium spp.

Treatments, rates and results by states follows --

ENTRIES IN SOUTHERN SOYBEAN DISEASE WORKERS

1982 UNIFORM SOYBEAN SEED TREATMENT TRIALS

| *Treatment No. and Firm | | Fungicide | Rate - oz./cwt. Product |
|---|---|---|---|
| ✓ 1. | Olin | Standard Terra-Coat L-205 | 7.0 |
| 2. | Olin | OAC 4360 50W | 2.0 |
| 3. | Olin | OAC 4360 50W | 4.0 |
| 4. | Olin | 4360 + Terrazole | 2.0 + 1.4 |
| 5. | Gustafson | Vitavax 200 FF | 4.0 |
| 6. | Gustafson | Vitavax 200 FF + Apron 2EC | 4.0 + 2.0 |
| ✓ 7. | Gustafson | Captan 30-DD + Vitavax 34 + Apron 2EC | 2 + 2 + 2 |
| 8. | Cargill | Flo Pro D + T | 10.06 + 4.55 |
| ✓ 9. | Cargill | Flo Pro D + T | 3.52 + 4.55 |
| 10. | Check | | ------ |
| 11. | Ortho | Orthocide 75 | 1.67 |
| 12. | NAPB | Thi-Protect-L | 7.9 |
| 13. | KALO | Stand-up | 6.7 |
| 14. | KALO | KL-777-04-82 | 6.0 |
| 15. | Ag Labs | Dormal | 5.0 |
| ✓ 16. | Helena | Vitavax M | 8.0 |
| 17. | Helena | HB-28 | 12.8 |
| 18. | Ciba-Geigy | Apron 350 FW + Vitavax 200 | 1.5 + 4 |
| 19. | Chipman | Captan 16.7 + TBZ-0.90% | 5.0 |
| 20. | Chipman | Captan 16.7 + TBZ-0.45% | 5.0 |
| 21. | Griffin | Captec 4L | 2.5 |
| 22. | Janssen | AAgrano droog 77 | 4.0 |

*Number Corresponds with that in data results.

STATE: ALABAMA
COOPERATOR: DR. WILLIAM GAZAWAY
AUBURN UNIV.
AUBURN, AL

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 207.00 | 4 | 20 |
| A | 195.40 | 5 | 13 |
| A | 192.80 | 5 | 7 |
| A | 190.60 | 5 | 8 |
| A | 184.00 | 5 | 3 |
| A | 183.20 | 5 | 19 |
| A | 181.60 | 5 | 15 |
| A | 180.80 | 5 | 2 |
| A | 180.80 | 5 | 4 |
| A | 180.80 | 5 | 21 |
| A | 180.00 | 5 | 17 |
| A | 178.40 | 5 | 11 |
| A | 177.60 | 5 | 9 |
| A | 176.00 | 5 | 10 |
| A | 174.40 | 5 | 6 |
| A | 173.60 | 5 | 5 |
| A | 173.60 | 5 | 14 |
| A | 172.80 | 5 | 12 |
| A | 171.20 | 5 | 16 |
| A | 169.60 | 5 | 1 |
| A | 168.80 | 5 | 18 |
| A | 167.20 | 5 | 22 |

STATE: ALABAMA
COOPERATOR: DR. WILLIAM GAZAWAY
AUBURN UNIV.
AUBURN, AL

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 24.440 | 5 | 14 |
| A | 23.140 | 5 | 16 |
| A | 23.120 | 5 | 15 |
| A | 22.860 | 5 | 12 |
| A | 22.580 | 5 | 17 |
| A | 22.320 | 5 | 4 |
| A | 22.040 | 5 | 8 |
| A | 22.040 | 5 | 6 |
| A | 21.800 | 5 | 5 |
| A | 21.780 | 5 | 2 |
| A | 21.780 | 5 | 21 |
| A | 21.500 | 5 | 19 |
| A | 21.240 | 5 | 11 |
| A | 21.240 | 5 | 18 |
| A | 20.575 | 4 | 20 |
| A | 20.460 | 5 | 1 |
| A | 20.160 | 5 | 13 |
| A | 19.620 | 5 | 7 |
| A | 19.100 | 5 | 22 |
| A | 18.840 | 5 | 10 |
| A | 18.820 | 5 | 3 |
| A | 18.300 | 5 | 9 |

STATE: ARKANSAS
COOPERATOR: DR. MARC HARRELL
SE RES. & EXT. CENTER
MONTICELLO, AR

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 182.50 | 5 | 18 |
| | A | | 180.04 | 5 | 7 |
| | A | | 180.02 | 5 | 20 |
| | A | | 178.42 | 5 | 6 |
| | A | | 178.38 | 5 | 16 |
| | A | | 177.54 | 5 | 1 |
| | A | | 177.14 | 5 | 13 |
| B | A | | 175.06 | 5 | 15 |
| B | A | | 173.42 | 5 | 4 |
| B | A | | 172.20 | 5 | 2 |
| B | A | | 171.38 | 5 | 19 |
| B | A | | 170.12 | 5 | 11 |
| B | A | | 169.72 | 5 | 5 |
| B | A | | 168.68 | 5 | 21 |
| B | A | C | 165.20 | 5 | 8 |
| B | A | C | 164.38 | 5 | 9 |
| B | A | C | 161.32 | 5 | 3 |
| B | A | C | 161.06 | 5 | 12 |
| B | A | C | 159.42 | 5 | 14 |
| B | | C | 153.64 | 5 | 17 |
| B | | C | 152.00 | 5 | 22 |
| | | C | 145.00 | 5 | 10 |

STATE: ARKANSAS
COOPERATOR: DR. MARC HARRELL
SE RES. & EXT. CENTER
MONTICELLO, AR

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|
| | A | 29.200 | 5 | 21 |
| B | A | 27.540 | 5 | 8 |
| B | A | 27.450 | 2 | 3 |
| B | A | 27.100 | 5 | 7 |
| B | A | 26.950 | 4 | 2 |
| B | A | 26.860 | 5 | 11 |
| B | A | 26.520 | 5 | 4 |
| B | A | 26.440 | 5 | 15 |
| B | A | 26.200 | 5 | 20 |
| B | A | 25.740 | 5 | 13 |
| B | A | 25.700 | 3 | 1 |
| B | A | 25.580 | 5 | 5 |
| B | A | 25.375 | 4 | 9 |
| B | A | 25.000 | 5 | 6 |
| B | A | 24.880 | 5 | 18 |
| B | A | 24.680 | 5 | 16 |
| B | A | 24.500 | 5 | 12 |
| B | A | 24.100 | 5 | 22 |
| B | A | 23.575 | 4 | 17 |
| B | A | 22.520 | 5 | 19 |
| B | A | 22.450 | 4 | 10 |
| B | | 20.500 | 4 | 14 |

STATE: FLORIDA
COOPERATOR: DR. F. M. STOKES
AG. RES. & EXT. CENT.
QUINCY, FL

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|---|---|
| | | | A | | | 181.00 | 5 | 8 |
| | B | | A | | | 178.60 | 5 | 16 |
| | B | | A | C | | 177.20 | 5 | 14 |
| | B | D | A | C | | 173.20 | 5 | 5 |
| E | B | D | A | C | | 172.00 | 5 | 18 |
| E | B | D | A | C | F | 170.00 | 5 | 20 |
| E | B | D | A | C | F | 168.60 | 5 | 21 |
| E | B | D | A | C | F | 168.20 | 5 | 13 |
| E | B | D | A | C | F | 167.20 | 5 | 7 |
| E | B | D | A | C | F | 167.00 | 5 | 15 |
| E | B | D | A | C | F | 166.80 | 5 | 6 |
| E | B | D | A | C | F | 164.20 | 5 | 19 |
| E | B | D | A | C | F | 163.20 | 5 | 11 |
| E | B | D | A | C | F | 162.80 | 5 | 9 |
| E | B | D | A | C | F | 159.80 | 5 | 12 |
| E | B | D | G | C | F | 158.00 | 5 | 17 |
| E | | D | G | C | F | 155.60 | 5 | 22 |
| E | | D | G | | F | 153.60 | 5 | 2 |
| E | | D | G | | F | 153.20 | 5 | 4 |
| E | | | G | | F | 150.80 | 5 | 3 |
| | | | G | | F | 150.00 | 5 | 10 |
| | | | G | | | 138.60 | 5 | 1 |

STATE: FLORIDA
COOPERATOR: DR. F. M. STOKES
AG. RES. & EXT. CENT.
QUINCY, FL

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 24.700 | 5 | 15 |
| B | A | | 23.400 | 5 | 6 |
| B | A | | 22.600 | 5 | 2 |
| B | A | C | 21.200 | 5 | 16 |
| B | A | C | 21.060 | 5 | 21 |
| B | A | C | 21.020 | 5 | 12 |
| B | A | C | 20.760 | 5 | 1 |
| B | A | C | 20.760 | 5 | 9 |
| B | A | C | 20.720 | 5 | 18 |
| B | A | C | 20.020 | 5 | 20 |
| B | A | C | 19.760 | 5 | 8 |
| B | A | C | 19.640 | 5 | 11 |
| B | A | C | 19.600 | 5 | 13 |
| B | A | C | 19.400 | 5 | 4 |
| B | A | C | 19.180 | 5 | 3 |
| B | A | C | 17.740 | 5 | 10 |
| B | A | C | 17.700 | 5 | 7 |
| B | A | C | 17.600 | 5 | 14 |
| B | A | C | 16.740 | 5 | 22 |
| B | | C | 16.660 | 5 | 5 |
| B | | C | 16.260 | 5 | 17 |
| | | C | 14.560 | 5 | 19 |

STATE: GEORGIA
COOPERATOR: D. V. PHILLIPS
UNIV. OF GEORGIA
ATHENS, GA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|
| | | A | | 161.60 | 5 | 19 |
| B | | A | | 159.60 | 5 | 16 |
| B | | A | C | 141.60 | 5 | 18 |
| B | | A | C | 140.40 | 5 | 7 |
| B | | A | C | 140.00 | 5 | 6 |
| B | | A | C | 138.80 | 5 | 5 |
| B | | A | C | 138.60 | 5 | 20 |
| B | | A | C | 136.40 | 5 | 13 |
| B | | A | C | 134.20 | 5 | 14 |
| B | | A | C | 133.20 | 5 | 21 |
| B | | A | C | 133.00 | 5 | 22 |
| B | D | A | C | 127.80 | 5 | 4 |
| B | D | A | C | 127.80 | 5 | 9 |
| B | D | A | C | 124.20 | 5 | 12 |
| B | D | A | C | 121.20 | 5 | 2 |
| B | D | A | C | 120.40 | 5 | 10 |
| B | D | | C | 119.00 | 5 | 11 |
| B | D | | C | 118.00 | 5 | 1 |
| B | D | | C | 117.60 | 5 | 3 |
| B | D | | C | 116.80 | 5 | 8 |
| | D | | C | 111.40 | 5 | 15 |
| | D | | | 90.00 | 5 | 17 |

STATE: GEORGIA
COOPERATOR: D. V. PHILLIPS
UNIV. OF GEORGIA
ATHENS, GA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 35.520 | 5 | 12 |
| B | 15.700 | 5 | 7 |
| B | 15.020 | 5 | 10 |
| B | 13.860 | 5 | 16 |
| B | 13.220 | 5 | 15 |
| B | 12.940 | 5 | 4 |
| B | 12.820 | 5 | 2 |
| B | 12.720 | 5 | 20 |
| B | 12.440 | 5 | 6 |
| B | 12.280 | 5 | 9 |
| B | 12.080 | 5 | 8 |
| B | 11.320 | 5 | 5 |
| B | 10.900 | 5 | 17 |
| B | 10.840 | 5 | 1 |
| B | 10.560 | 5 | 22 |
| B | 10.460 | 5 | 3 |
| B | 9.440 | 5 | 21 |
| B | 8.900 | 5 | 14 |
| B | 8.900 | 5 | 19 |
| B | 8.740 | 5 | 18 |
| B | 7.440 | 5 | 11 |
| B | 7.440 | 5 | 13 |

STATE: LOUISIANA
COOPERATOR: GERARD BERGGREN
LOUISIANA ST. UNIV.
BATON ROUGE. LA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|
| | | A | | 172.60 | 5 | 12 |
| B | | A | | 156.00 | 5 | 19 |
| B | | A | | 153.20 | 5 | 13 |
| B | | A | C | 147.40 | 5 | 6 |
| B | | A | C | 147.40 | 5 | 21 |
| B | | A | C | 145.80 | 5 | 15 |
| B | D | A | C | 144.00 | 5 | 4 |
| B | D | A | C | 143.60 | 5 | 16 |
| B | D | A | C | 141.40 | 5 | 10 |
| B | D | A | C | 141.20 | 5 | 5 |
| B | D | A | C | 140.40 | 5 | 9 |
| B | D | | C | 138.80 | 5 | 11 |
| B | D | | C | 138.40 | 5 | 2 |
| B | D | | C | 133.60 | 5 | 8 |
| B | D | | C | 133.40 | 5 | 18 |
| B | D | | C | 132.00 | 5 | 14 |
| B | D | | C | 131.80 | 5 | 17 |
| B | D | | C | 130.80 | 5 | 20 |
| B | D | | C | 130.00 | 5 | 3 |
| B | D | | C | 126.40 | 5 | 1 |
| | D | | C | 118.80 | 5 | 7 |
| | D | | | 111.20 | 5 | 22 |

STATE: LOUISIANA
COOPERATOR: GERARD BERGGREN
LOUISIANA ST. UNIV.
BATON ROUGE, LA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 41.480 | 5 | 19 |
| B | A | | 37.820 | 5 | 12 |
| B | A | | 36.360 | 5 | 8 |
| B | A | | 36.240 | 5 | 20 |
| B | A | C | 35.720 | 5 | 15 |
| B | A | C | 35.640 | 5 | 16 |
| B | A | C | 34.160 | 5 | 10 |
| B | A | C | 33.380 | 5 | 11 |
| B | A | C | 33.160 | 5 | 5 |
| B | A | C | 33.020 | 5 | 13 |
| B | A | C | 32.240 | 5 | 17 |
| B | A | C | 31.840 | 5 | 14 |
| B | A | C | 31.780 | 5 | 18 |
| B | | C | 31.020 | 5 | 21 |
| B | | C | 30.980 | 5 | 2 |
| B | | C | 30.220 | 5 | 7 |
| B | | C | 29.700 | 5 | 6 |
| B | | C | 29.560 | 5 | 9 |
| B | | C | 29.360 | 5 | 1 |
| B | | C | 29.300 | 5 | 22 |
| B | | C | 28.320 | 5 | 4 |
| | | C | 26.160 | 5 | 3 |

STATE: MARYLAND
COOPERATOR: JAMES KANTZES
VEG. RES. FARM
SALISBURY, MD

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 206.40 | 5 | 7 |
| B | A | | 197.40 | 5 | 5 |
| B | A | | 195.00 | 5 | 11 |
| B | A | | 194.80 | 5 | 20 |
| B | A | | 193.20 | 5 | 9 |
| B | A | C | 190.20 | 5 | 6 |
| B | A | C | 189.60 | 5 | 21 |
| B | A | C | 189.20 | 5 | 18 |
| B | A | C | 188.60 | 5 | 8 |
| B | A | C | 188.00 | 5 | 13 |
| B | A | C | 188.00 | 5 | 14 |
| B | A | C | 186.20 | 5 | 16 |
| B | A | C | 186.00 | 5 | 19 |
| B | | C | 183.60 | 5 | 1 |
| B | D | C | 179.20 | 5 | 12 |
| E | D | C | 171.60 | 5 | 4 |
| E | D | C | 171.40 | 5 | 2 |
| E | D | | 161.80 | 5 | 15 |
| E | | | 153.60 | 5 | 10 |
| E | | | 153.00 | 5 | 3 |
| | F | | 129.00 | 5 | 17 |
| | F | | 111.80 | 5 | 22 |

STATE: MARYLAND
COOPERATOR: JAMES KANTZES
VEG. RES. FARM
SALISBURY, MD

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|
| | A | 38.980 | 5 | 4 |
| | A | 37.300 | 5 | 10 |
| | A | 37.280 | 5 | 12 |
| | A | 37.040 | 5 | 11 |
| | A | 36.820 | 5 | 13 |
| B | A | 36.040 | 5 | 14 |
| B | A | 35.380 | 5 | 5 |
| B | A | 35.340 | 5 | 19 |
| B | A | 35.100 | 5 | 18 |
| B | A | 34.260 | 5 | 20 |
| B | A | 33.960 | 5 | 3 |
| B | A | 33.740 | 5 | 8 |
| B | A | 33.640 | 5 | 21 |
| B | A | 33.580 | 5 | 16 |
| B | A | 32.920 | 5 | 17 |
| B | A | 32.820 | 5 | 2 |
| B | A | 32.720 | 5 | 22 |
| B | A | 32.700 | 5 | 1 |
| B | A | 32.160 | 5 | 15 |
| B | A | 32.000 | 5 | 7 |
| B | A | 31.880 | 5 | 6 |
| B | | 29.300 | 5 | 9 |

STATE: MISSISSIPPI
COOPERATOR: DR. KEN ROY
MISS. ST. UNIV.
CLARKSVILLE. MI

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|---|---|
| | | | A | | | 191.60 | 5 | 5 |
| | | | A | | | 190.80 | 5 | 13 |
| | | | A | | | 190.00 | 5 | 14 |
| | | | A | | | 188.00 | 5 | 8 |
| | B | | A | | | 187.20 | 5 | 18 |
| | B | | A | | C | 185.20 | 5 | 22 |
| | B | | A | | C | 180.00 | 5 | 7 |
| | B | | A | | C | 179.60 | 5 | 9 |
| | B | | A | | C | 179.20 | 5 | 16 |
| | B | | A | | C | 178.40 | 5 | 20 |
| | B | | A | | C | 173.60 | 5 | 11 |
| | B | | A | | C | 171.60 | 5 | 6 |
| | B | | A | | C | 171.20 | 5 | 4 |
| | B | | A | | C | 169.20 | 5 | 12 |
| | B | D | A | | C | 164.40 | 5 | 2 |
| | B | D | A | | C | 160.40 | 5 | 3 |
| E | B | D | A | | C | 158.80 | 5 | 1 |
| E | B | D | | F | C | 150.40 | 5 | 21 |
| E | | D | | F | C | 148.80 | 5 | 19 |
| E | | D | | F | | 133.60 | 5 | 17 |
| E | | | | F | | 125.60 | 5 | 10 |
| | | | | F | | 119.20 | 5 | 15 |

STATE: MISSISSIPPI
COOPERATOR: DR. KEN ROY
MISS. ST. UNIV.
CLARKSVILLE. MI

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 27.600 | 5 | 7 |
| | A | | 27.420 | 5 | 13 |
| | A | | 27.380 | 5 | 20 |
| | A | | 27.340 | 5 | 22 |
| | A | | 26.980 | 5 | 9 |
| B | A | | 26.200 | 5 | 5 |
| B | A | | 26.140 | 5 | 14 |
| B | A | | 26.020 | 5 | 11 |
| B | A | | 25.820 | 5 | 8 |
| B | A | | 25.020 | 5 | 1 |
| B | A | | 24.900 | 5 | 21 |
| B | A | | 24.800 | 5 | 12 |
| B | A | | 24.720 | 5 | 6 |
| B | A | | 24.440 | 5 | 18 |
| B | A | | 24.320 | 5 | 3 |
| B | A | C | 23.880 | 5 | 19 |
| B | A | C | 23.700 | 5 | 2 |
| B | A | C | 23.640 | 5 | 4 |
| B | A | C | 23.540 | 5 | 16 |
| B | | C | 22.140 | 5 | 17 |
| B | | C | 22.100 | 5 | 15 |
| | | C | 19.580 | 5 | 10 |

STATE: MISSOURI
COOPERATOR: DR. AL WRATHER
DELTA CENTER
PORTAGEVILLE, MO

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 205.80 | 5 | 2 |
| A | 203.20 | 5 | 21 |
| A | 200.00 | 5 | 6 |
| A | 198.00 | 5 | 9 |
| A | 197.40 | 5 | 16 |
| A | 196.40 | 5 | 15 |
| A | 192.20 | 5 | 13 |
| A | 188.00 | 5 | 4 |
| A | 183.40 | 5 | 1 |
| A | 183.00 | 5 | 19 |
| A | 179.00 | 5 | 14 |
| A | 176.80 | 5 | 8 |
| A | 176.40 | 5 | 20 |
| A | 175.60 | 5 | 10 |
| A | 174.00 | 5 | 18 |
| A | 169.80 | 5 | 11 |
| A | 165.40 | 5 | 22 |
| A | 164.40 | 5 | 5 |
| A | 161.60 | 5 | 17 |
| A | 158.40 | 5 | 3 |
| A | 154.80 | 5 | 12 |
| A | 152.80 | 5 | 7 |

STATE: MISSOURI
COOPERATOR: DR. AL WRATHER
DELTA CENTER
PORTAGEVILLE, MO

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 37.638 | 5 | 21 |
| A | 37.066 | 5 | 3 |
| A | 35.692 | 5 | 20 |
| A | 35.348 | 5 | 11 |
| A | 34.322 | 5 | 15 |
| A | 34.320 | 4 | 2 |
| A | 33.290 | 5 | 9 |
| A | 33.062 | 5 | 1 |
| A | 32.490 | 5 | 8 |
| A | 31.806 | 5 | 6 |
| A | 31.460 | 5 | 4 |
| A | 31.348 | 5 | 7 |
| A | 30.776 | 5 | 19 |
| A | 29.972 | 5 | 14 |
| A | 28.486 | 5 | 13 |
| A | 28.486 | 5 | 17 |
| A | 28.457 | 4 | 18 |
| A | 28.144 | 5 | 10 |
| A | 27.684 | 5 | 12 |
| A | 27.682 | 5 | 5 |
| A | 27.342 | 5 | 16 |
| A | 27.342 | 5 | 22 |

STATE: OKLAHOMA
COOPERATOR: DR. R. V. STURGEON
OKLAHOMA ST. UNIV.
STILLWATER, OK

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|---|
| | A | 138.60 | 5 | 22 |
| | A | 137.00 | 5 | 21 |
| | A | 135.80 | 5 | 11 |
| B | A | 134.00 | 5 | 20 |
| B | A | 133.40 | 5 | 10 |
| B | A | 129.20 | 5 | 12 |
| B | A | 129.20 | 5 | 19 |
| B | A | 126.80 | 5 | 6 |
| B | A | 125.80 | 5 | 8 |
| B | A | 125.40 | 5 | 1 |
| B | A | 123.80 | 5 | 13 |
| B | A | 120.80 | 5 | 15 |
| B | A | 120.20 | 5 | 18 |
| B | A | 119.80 | 5 | 17 |
| B | A | 117.80 | 5 | 5 |
| B | A | 117.40 | 5 | 2 |
| B | A | 117.00 | 5 | 16 |
| B | A | 116.40 | 5 | 14 |
| B | A | 113.00 | 5 | 3 |
| B | A | 113.00 | 5 | 4 |
| B | A | 110.00 | 5 | 9 |
| B | | 103.20 | 5 | 7 |

STATE: NORTH CAROLINA
COOPERATOR: DR. D. P. SCHMITT
N. CAROLINA ST. UNIV.
RALEIGH, NC

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 199.20 | 5 | 7 |
| A | 199.20 | 5 | 9 |
| A | 191.20 | 5 | 16 |
| A | 190.40 | 5 | 2 |
| A | 189.60 | 5 | 6 |
| A | 188.80 | 5 | 14 |
| A | 186.40 | 5 | 8 |
| A | 180.00 | 5 | 20 |
| A | 178.40 | 5 | 18 |
| A | 176.80 | 5 | 22 |
| A | 176.00 | 5 | 5 |
| A | 175.20 | 5 | 10 |
| A | 174.40 | 5 | 19 |
| A | 171.20 | 5 | 3 |
| A | 168.00 | 5 | 13 |
| A | 165.60 | 5 | 12 |
| A | 161.60 | 5 | 11 |
| A | 160.80 | 5 | 1 |
| A | 157.60 | 5 | 21 |
| A | 156.80 | 5 | 4 |
| A | 156.80 | 5 | 15 |
| A | 153.60 | 5 | 17 |

STATE: NORTH CAROLINA
COOPERATOR: DR. D. P. SCHMITT
N. CAROLINA ST. UNIV.
RALEIGH, NC

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|---|
| | A | 52.189 | 5 | 8 |
| B | A | 45.461 | 5 | 1 |
| B | A | 45.259 | 5 | 5 |
| B | A | 44.176 | 5 | 10 |
| B | A | 43.268 | 5 | 11 |
| B | A | 41.756 | 5 | 22 |
| B | A | 41.530 | 5 | 7 |
| B | A | 39.085 | 5 | 16 |
| B | A | 38.455 | 5 | 9 |
| B | A | 37.850 | 5 | 18 |
| B | A | 37.775 | 5 | 4 |
| B | A | 37.523 | 5 | 3 |
| B | A | 37.372 | 5 | 13 |
| B | A | 36.968 | 5 | 2 |
| B | A | 36.943 | 5 | 20 |
| B | A | 36.086 | 5 | 15 |
| B | A | 34.776 | 5 | 14 |
| B | A | 34.726 | 5 | 21 |
| B | A | 34.222 | 5 | 19 |
| B | | 33.818 | 5 | 17 |
| B | | 32.382 | 5 | 6 |
| B | | 30.517 | 5 | 12 |

STATE: TENNESSEE
COOPERATOR: MR. ALBERT CHAMBERS
605 AIRWAYS BLVD.
JACKSON, TN

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|
| | | A | | 214.40 | 5 | 19 |
| | | A | | 213.60 | 5 | 8 |
| B | | A | | 213.20 | 5 | 7 |
| B | | A | | 212.60 | 5 | 20 |
| B | | A | C | 210.80 | 5 | 5 |
| B | | A | C | 210.00 | 5 | 9 |
| B | | A | C | 209.60 | 5 | 14 |
| B | | A | C | 208.20 | 5 | 6 |
| B | | A | C | 207.40 | 5 | 18 |
| B | | A | C | 206.40 | 5 | 12 |
| B | | A | C | 205.80 | 5 | 16 |
| B | D | A | C | 204.40 | 5 | 1 |
| B | D | A | C | 203.80 | 5 | 11 |
| B | D | A | C | 203.60 | 5 | 4 |
| B | D | A | C | 203.40 | 5 | 13 |
| B | D | A | C | 202.80 | 5 | 21 |
| B | D | | C | 199.60 | 5 | 22 |
| | D | E | C | 198.80 | 5 | 2 |
| | D | E | C | 198.00 | 5 | 3 |
| F | D | E | | 191.60 | 5 | 17 |
| F | | E | | 187.00 | 5 | 15 |
| F | | | | 183.20 | 5 | 10 |

STATE: TENNESSEE
COOPERATOR: MR. ALBERT CHAMBERS
605 AIRWAYS BLVD.
JACKSON, TN

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 41.340 | 5 | 3 |
| B | A | | 40.520 | 5 | 21 |
| B | A | C | 38.120 | 5 | 6 |
| B | A | C | 37.220 | 5 | 15 |
| B | A | C | 36.940 | 5 | 13 |
| B | A | C | 36.800 | 5 | 20 |
| B | A | C | 36.540 | 5 | 9 |
| B | A | C | 36.400 | 5 | 1 |
| B | A | C | 35.860 | 5 | 7 |
| B | A | C | 35.580 | 5 | 12 |
| B | A | C | 35.480 | 5 | 10 |
| B | A | C | 34.540 | 5 | 19 |
| B | A | C | 33.720 | 5 | 17 |
| B | A | C | 33.200 | 5 | 2 |
| B | A | C | 32.660 | 5 | 14 |
| B | A | C | 32.280 | 5 | 18 |
| B | A | C | 30.020 | 5 | 5 |
| B | | C | 29.360 | 5 | 16 |
| B | | C | 28.740 | 5 | 8 |
| | | C | 28.260 | 5 | 4 |
| | | C | 27.460 | 5 | 11 |
| | | C | 26.380 | 5 | 22 |

STATE: TEXAS
COOPERATOR: DR. GLENN WHITNEY
AG. RES. & EXT. CENT.
BEAUMONT, TX

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|
| | A | | 150.00 | 5 | 13 |
| B | A | | 146.80 | 5 | 9 |
| B | A | | 146.20 | 5 | 7 |
| B | A | C | 139.60 | 5 | 21 |
| B | A | C | 139.20 | 5 | 22 |
| B | A | C | 128.60 | 5 | 18 |
| B | A | C | 125.00 | 5 | 11 |
| B | A | C | 124.60 | 5 | 6 |
| B | A | C | 124.40 | 5 | 16 |
| B | A | C | 120.80 | 5 | 4 |
| B | A | C | 118.60 | 5 | 19 |
| B | A | C | 117.60 | 5 | 8 |
| B | A | C | 116.40 | 5 | 12 |
| B | A | C | 116.00 | 5 | 10 |
| B | A | C | 115.60 | 5 | 1 |
| B | A | C | 114.60 | 5 | 3 |
| B | A | C | 110.40 | 5 | 20 |
| B | | C | 109.60 | 5 | 14 |
| B | | C | 107.20 | 5 | 5 |
| | | C | 105.00 | 5 | 2 |
| | | C | 104.60 | 5 | 15 |
| | D | | 59.80 | 5 | 17 |

STATE: TEXAS
COOPERATOR: DR. GLENN WHITNEY
AG. RES. & EXT. CENT.
BEAUMONT, TX

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 22.960 | 5 | 3 |
| B A | 22.680 | 5 | 9 |
| B A C | 20.800 | 5 | 1 |
| B A C | 20.460 | 5 | 5 |
| B A C | 20.280 | 5 | 22 |
| B A C | 20.220 | 5 | 21 |
| B D A C | 19.940 | 5 | 14 |
| B D A C | 19.600 | 5 | 4 |
| B D E C | 18.520 | 5 | 13 |
| D E C | 18.240 | 5 | 18 |
| F D E C | 17.800 | 5 | 7 |
| F D E C | 17.620 | 5 | 2 |
| F D E C | 17.160 | 5 | 11 |
| F D E C | 16.780 | 5 | 16 |
| F D E C | 16.740 | 5 | 15 |
| F D E G | 15.820 | 5 | 6 |
| F E G | 14.740 | 5 | 19 |
| F G | 13.900 | 5 | 20 |
| F G | 13.600 | 5 | 12 |
| G | 12.400 | 5 | 8 |
| G | 12.260 | 5 | 10 |
| G | 12.040 | 5 | 17 |

STATE: VIRGINIA(S)
COOPERATOR: DR. JOHN TAYLOR
J & S PLANT CONSULT.
SKIPPERS, VA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | | | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|---|
| | | | A | | 187.80 | 5 | 13 |
| | B | | A | | 172.00 | 5 | 18 |
| | B | | A | C | 169.20 | 5 | 7 |
| | B | D | A | C | 155.60 | 5 | 8 |
| | B | D | A | C | 151.80 | 5 | 11 |
| | B | D | A | C | 147.40 | 5 | 21 |
| | B | D | A | C | 147.00 | 5 | 20 |
| | B | D | A | C | 145.40 | 5 | 19 |
| E | B | D | A | C | 143.60 | 5 | 4 |
| E | B | D | A | C | 137.60 | 5 | 6 |
| E | B | D | A | C | 133.60 | 5 | 1 |
| E | B | D | A | C | 130.80 | 5 | 16 |
| E | B | D | A | C | 127.60 | 5 | 5 |
| E | B | D | A | C | 121.00 | 5 | 15 |
| E | B | D | A | C | 120.40 | 5 | 10 |
| E | B | D | | C | 108.40 | 5 | 9 |
| E | | D | | C | 97.00 | 5 | 12 |
| E | | D | | | 93.20 | 5 | 14 |
| E | | D | | | 92.60 | 5 | 3 |
| E | | D | | | 90.60 | 5 | 22 |
| E | | D | | | 87.80 | 5 | 2 |
| E | | | | | 70.80 | 5 | 17 |

STATE: VIRGINIA(S)
COOPERATOR: DR. JOHN TAYLOR
J & S PLANT CONSULT.
SKIPPERS, VA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|---|
| | A | 32.400 | 5 | 9 |
| B | A | 31.400 | 5 | 13 |
| B | A | 30.400 | 5 | 21 |
| B | A | 30.000 | 5 | 1 |
| B | A | 28.400 | 5 | 2 |
| B | A | 28.200 | 5 | 6 |
| B | A | 27.800 | 5 | 22 |
| B | A | 27.600 | 5 | 8 |
| B | A | 27.000 | 5 | 18 |
| B | A | 26.800 | 5 | 11 |
| B | A | 26.400 | 5 | 5 |
| B | A | 26.000 | 5 | 17 |
| B | A | 25.800 | 5 | 20 |
| B | A | 24.400 | 5 | 12 |
| B | A | 24.400 | 5 | 14 |
| B | A | 23.200 | 5 | 4 |
| B | A | 22.400 | 5 | 19 |
| B | A | 22.000 | 5 | 7 |
| B | A | 21.800 | 5 | 15 |
| B | A | 20.000 | 5 | 16 |
| B | A | 19.800 | 5 | 10 |
| B | | 18.000 | 5 | 3 |

STATE: VIRGINIA(W)
COOPERATOR: D. E. BABINEAU
UNIV. OF VIRGINIA
WARSAW, VA

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN | GROUPING | | | MEAN | N | TREATMNT |
|---|---|---|---|---|---|---|
| | | A | | 213.60 | 5 | 14 |
| B | | A | | 210.00 | 5 | 13 |
| B | | A | | 208.80 | 5 | 9 |
| B | | A | | 208.40 | 5 | 1 |
| B | | A | | 207.60 | 5 | 8 |
| B | | A | C | 197.60 | 5 | 16 |
| B | | A | C | 197.60 | 5 | 22 |
| B | | A | C | 196.40 | 5 | 11 |
| B | | A | C | 193.60 | 5 | 6 |
| B | | A | C | 193.20 | 5 | 18 |
| B | | A | C | 192.40 | 5 | 4 |
| B | D | A | C | 186.00 | 5 | 20 |
| B | D | A | C | 185.40 | 5 | 19 |
| B | D | A | C | 181.60 | 5 | 21 |
| B | D | A | C | 180.00 | 5 | 12 |
| B | D | A | C | 175.20 | 5 | 5 |
| B | D | A | C | 174.80 | 5 | 3 |
| B | D | A | C | 174.40 | 5 | 7 |
| B | D | A | C | 166.40 | 5 | 17 |
| B | D | | C | 162.40 | 5 | 2 |
| | D | | C | 157.20 | 5 | 10 |
| | D | | | 142.40 | 5 | 15 |

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MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

| DUNCAN GROUPING | MEAN | N | TREATMNT |
|---|---|---|---|
| A | 24.500 | 5 | 14 |
| A | 21.180 | 5 | 5 |
| A | 20.940 | 5 | 11 |
| A | 20.940 | 5 | 16 |
| A | 20.840 | 5 | 9 |
| A | 20.320 | 5 | 1 |
| A | 20.080 | 5 | 7 |
| A | 19.540 | 5 | 12 |
| A | 19.040 | 5 | 22 |
| A | 19.000 | 5 | 3 |
| A | 18.080 | 5 | 17 |
| A | 18.080 | 5 | 18 |
| A | 17.720 | 5 | 4 |
| A | 17.360 | 5 | 19 |
| A | 16.680 | 5 | 15 |
| A | 16.600 | 5 | 10 |
| A | 16.220 | 5 | 2 |
| A | 16.190 | 5 | 8 |
| A | 15.900 | 5 | 6 |
| A | 15.900 | 5 | 13 |
| A | 15.840 | 5 | 21 |
| A | 14.700 | 5 | 20 |

# Factors Affecting the Survival and Density of *Macrophomina phaseolina* in Soil

by

Thomas D. Wyllie

Charcoal rot, caused by the soil borne fungus pathogen *Macrophomina phaseolina* is a serious disease of soybeans, and other crops, throughout the southern U.S. Since varieties resistant to the pathogen are not as yet available, it is important that we understand the factors that contribute to increased numbers of the organism in soil. Population densities in the 10-15 propagules/gram of soil range may result in yield reductions of 2-5 bushels/acre. As the pathogen numbers increase the corresponding yields decrease. Yield reduction is always correlated with fungus population but the actual reduction in bu./ac. actually seen is a reflection of other factors as well. Upwards of 100,000 sclerotia/gram of tissue are frequently produced in soybeans by the end of the growing season. Each of these sclerotia may consist of from 50-150 cells. Each cell is capable of germinating and causing an infection. The inoculum potential is enormous. Monocropping with soybeans increases the density of the fungus in the soil, usually by doubling the density annually. Although the pathogen has a very wide host range, there is evidence that crop sequencing with hosts such as corn and sorghum may result in lower populations of the fungus in soil than monocropping with soybeans. Alternate freezing and thawing periods effectively reduce fungus numbers which may account for the geographic distribution patterns we see for this organism. Pathogen activity is controlled by soil fertility factors, especially phosphorus and potassium levels and pH. Between 30-50% of the variability in pathogen density can be accounted for on the basis of these factors. Reduced oxygen levels accompanying high moisture lowers fungus activity as measured by sclerotial formation. Therefore, minimum tillage may adversely affect pathogen numbers and activity. The damage caused by any given population of the pathogen is the result of pathogn density, the activity of the pathogen under the existing growing conditions, and the stresses that are present on the host plant itself.

Southern Soybean Disease Workers Conference

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Abstract: Epidemiology and control of soybean seed diseases.

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More than 30 microorganisms have been recorded as seed-borne on soybeans. The majority have never been shown to cause disease as a result of their presence on seeds. For some, however, such as *Phomopsis* spp., soybean mosaic virus, *Peronospora manshurica*, *Cercospora kikuchii*, *Colletotrichum dematium* var. *truncatum*, *Macrophomina phaseolina* and *Fusarium* spp., the seed-borne phase is of significance with respect to disease development. In northern soybean growing regions of U.S. much attention has been paid to the *Phomopsis* spp. including *Diaporthe phaseolorum* var. *sojae* (Dps) and an unnamed *Phomopsis* sp., the causal agents of pod and stem blight and *Diaporthe phaseolorum* var. *caulivora* (Dpc), the cause of stem canker. These fungi also cause Phomopsis seed decay which can result in serious losses to seed producers due to reduced germination.

Epidemiological studies on this disease have shown that seed infected with Dps and *Phomopsis* sp. are of less importance as a source of inoculum than are infected soybean crop residues. The significance of seed-borne Dpc, as an inoculum source has not been established either for stem canker or seed decay, however. It is not known how the pathogens are transmitted from inoculum sources to plants or how infection spreads throughout plants. Pods, however, are a pathway for seed infection. Pod infection can occur at any time after flowering, but significant seed infection will not occur until after physiological maturity and only if prolonged periods of high humidity occur at that time.

Although some improvement in germination can be achieved by treating infected seed with a fungicide, the most effective control for Phomopsis seed decay is to apply foliar fungicides to the growing seed crop. In some growing areas, particularly in the northern U.S., the disease often is not severe enough to justify this treatment. Disease predictive methods, therefore, have been developed to identify fields that should be sprayed. One approach is to use a points system which is based on the presence of factors known to be associated with development of soybean seed decay, such as planting date, maturity group, rainfall, etc. This method relies entirely on indirect measurements of the disease and cannot account for unexpected increases in the pathogen. Another method, developed in Iowa, does account for this by directly measuring inoculum on pods. Pods are detached in the field, treated with a surface sterilant, then immersed in a herbicide and incubated in a moisture chamber for 7 days. Infected pods are then recognized by the presence of *Phomopsis* pycnidia. The materials and equipment for this test can be purchased at a hardware store and with minimal training, growers can conduct the test themselves.

Evaluations for Resistance to Seed Diseases--J. P.Ross
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A soybean breeding program attempting to transfer resistance to seed invasion and rot by *Phomopsis sojae*, was initiated in 1977. The sources of resistance were selected from the Germ Plasm collection in Maturity Groups V, VI, and VII. Since seed deterioration is usually associated with warm moist weather following seed maturation, evaluations can only be made once a year under optimum disease conditions. The evaluation system developed requires that the nursery be planted in soil that grew soybeans the previous year (to increase inoculum) and that the lines be cut out 3-5 days after the plant dries (maturity). Ten to 12 stalks from each line are tied in a bundle and placed in a moist chamber for about 38 hrs at approximately 25°C. The bundles are then taken out of the chamber, allowed to dry, and each plant threshed separately. Ten seed from each plant are surface sterilized and plated out on acidified PDA. Notes are taken on the number of seed yielding *Phomopsis* after 3 wks incubation under lights. Additional seed platings are made from plants with a low percentage of infected seed, and they are also visually evaluated. Plants with good appearing seed and low frequency of *Phomopsis* are re-evaluated the following year and backcrossed to cultivars with desirable agronomic characters. $F^3$ families from these crosses are evaluatd in the field.

Whether this method will lead to improved *Phomopsis* resistance in breeding lines is still unknown. During the 1981 season, selected lines were grown in Florida and seed were harvested about 7 weeks after maturity to increase seed deterioration. Seed of some selected lines yielded less than 10% *Phomopsis* whereas cultivars such as Forrest contained 60% *Phomopsis*.

# Southern Soybean Disease Workers
# Standardized Foliar Fungicide Test, 1982

Compiled by A. Y. Chambers and M. A. Newman, Co-Chairmen
Associate Professors, Department of Entomology and Plant Pathology
University of Tennessee

Foliar fungicide tests were conducted in 12 states in 1982 as part of the Standardized Foliar Fungicide Test. Eleven treatments nominated at the 1982 annual meeting and an untreated check were evaluated at all locations. Forrest variety was planted in five tests, Davis in four, Williams in two, and Essex in one. Weather conditions varied greatly from state to state ranging from very dry conditions to an overabundance of rain.

Incidence of diseases was fairly low at most locations, and only four states recorded significant yield increases. However, average yields across states showed significant yield increases with four fungicides when compared to the untreated check. These were Topsin-M 70WP, Super Tin 4L, Benlate 50WP, and Topsin-M 4F. Anthracnose and pod and stem blight were the most prevalent diseases in 1982 with seven states recording disease ratings of injury; others reported traces. Brown spot was also recorded at damaging levels by five states. Two states reported significant Cercospora leaf blight, two had enough downy mildew to rate, and one reported low levels of frogeye and bacterial blight. One other state reported trace amounts of downy mildew, brown spot, and frogeye.

In Kentucky, harvested seed from each plot were plated out to determine disease organisms infesting seed from the various fungicide treatments. Diaporthe spp., Cercospora spp., and Alternaria spp. were isolated most often. Generally, fungicides reduced percentages of seed infested with disease organism and increased percentages of healthy seed. There were a few exceptions in which percentages of seed infested with an organism were higher in seed from treated plots. Benlate 50WP, 2 lb./A., applied at R6 stage only for seed beans, reduced seed with Diaporthe spp. and Cercospora spp. and increased healthy seed when compared to a water check, but percentages of seed with Alternaria spp. were increased after the treatment. Differences were not as great or were not present at all when the treatment was compared to the untreated check. Yield and incidence of anthracnose and pod and stem blight were not different in field plots treated with the 2-lb. rate of Benlate 50WP at R6 stage and the 0.5-lb. rate at R3 and R5. Yield or disease incidence were not different in plots of a water check and the untreated check.

## Participants of the Standardized Foliar Fungicide Test

| State | Test Location | Participant |
|---|---|---|
| Arkansas | Marianna | Dr. H. J. Walters<br>University of Arkansas<br>Fayetteville, AR |
| Florida | Quincy | Dr. F. M. Shokes<br>University of Florida<br>Quincy, FL |
| Georgia | Experiment | Dr. D. V. Phillips<br>University of Georgia<br>Experiment, GA |
| Kentucky | Lexington | Dr. R. E. Stuckey<br>University of Kentucky<br>Lexington, KY |
| Louisiana | Baton Rouge | Dr. G. T. Berggren<br>Louisiana State University<br>Baton Rouge, LA |
| Maryland | Salisbury | Dr. J. G. Kantzes<br>University of Maryland<br>Salisbury, MD |
| Missouri | Portageville | Dr. J. A. Wrather<br>University of Missouri<br>Portageville, MO |
| North Carolina | Northampton | Dr. J. D. Taylor<br>J & S Consultants<br>Skippers, VA |
| Oklahoma | Weber Falls | Dr. R. V. Sturgeon, Jr.<br>Oklahoma State University<br>Stillwater, OK |
| Tennessee | Jackson | Mr. A. Y. Chambers<br>University of Tennessee<br>Jackson, TN |
| Texas | Beaumont | Dr. N. G. Whitney<br>Texas A & M University<br>Beaumont, TX |
| Virginia | Tucker Hill | Dr. D. E. Babineau<br>VPI and State University<br>Warsaw, VA |

Acknowledgement: The work and cooperation received from the participants and companies supporting the standardized foliar fungicide test is greatly appreciated. Due credit is given to Dr. Charles Patrick and Mr. Gordon Percell for analysis of the data.

Table 1. Yield Data for the Standardized Foliar Fungicide Test, Southern Soybean Disease Workers, 1982.[1]

| Treatment | Location and Yield (Bu./A.) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fungicide and Rate/A. | AR | FL | GA | KY | LA | MD | MO | NC | OK | TN | TX | VA | Mean |
| Mertect 340-F, 8 fl. oz. | 51.8a-d[2] | 42.2a | 24.1a | 28.0a | 39.7a | 44.7a | 45.6ab | 21.0d | 52.7ab | 52.9a | 33.0a | 31.4a | 38.9bcd |
| Du-Ter 30F, 4 oz. ai | 55.3a | 43.8a | 28.8a | 25.4a | 44.1a | 45.5a | 44.6ab | 23.5cd | 52.7ab | 54.5a | 37.4a | 27.7a | 40.3a-d |
| Bravo 500, 3 pt. | 51.9a-d | 44.0a | 24.5a | 27.5a | 42.9a | 46.6a | 46.6ab | 25.2bcd | 50.5abc | 55.3a | 37.1a | 31.7a | 40.3a-d |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 53.7ab | 45.5a | 26.0a | 28.7a | 41.4a | 43.3a | 45.4ab | 25.2bcd | 49.1bc | 46.1a | 38.7a | 31.5a | 39.6a-d |
| Topsin-M 70WP, 8 oz. | 51.1bcd | 42.5a | 23.8a | 24.2a | 37.9a | 44.9a | 47.2ab | 35.1a | 53.5a | 53.0a | 37.7a | 34.3a | 40.4abc |
| TPTH 50WP, 8 oz. | 55.0a | 46.1a | 27.1a | 26.9a | 42.7a | 45.9a | 48.4ab | 21.5d | 51.4abc | 47.4a | 38.8a | 30.7a | 40.2a-d |
| Difolatan 4F, 2 pt. | 53.2ab | 39.7a | 26.6a | 27.5a | 40.4a | 45.4a | 46.8ab | 20.7d | 49.7abc | 51.1a | 35.3a | 27.6a | 38.7cd |
| Super Tin 4L, 7 fl. oz. | 52.2a-d | 45.7a | 26.6a | 28.8a | 43.0a | 46.3a | 47.2ab | 34.9a | 53.3ab | 50.9a | 38.6a | 34.5a | 41.8a |
| EL-228 .33EC, 40 g ai | 49.1cd | 40.7a | 27.8a | 27.7a | 38.9a | 47.5a | 46.3ab | 31.8ab | 52.0abc | 46.3a | 37.1a | 31.7a | 39.7a-d |
| Benlate 50WP, 8 oz. | 52.8abc | 45.8a | 25.8a | 27.0a | 39.7a | 46.1a | 50.0a | 30.5abc | 52.4ab | 55.6a | 34.7a | 30.1a | 40.9abc |
| Topsin-M 4F, .35 lb. ai | 50.8bcd | 45.8a | 22.5a | 26.7a | 45.2a | 46.3a | 50.7a | 31.6ab | 49.7abc | 51.3a | 39.6a | 32.3a | 41.0ab |
| Untreated check | 48.6d | 44.2a | 23.8a | 25.4a | 39.4a | 44.2a | 43.2b | 21.4d | 48.3c | 51.4a | 35.5a | 32.0a | 38.1d |
| C. V. (%) | 4.9 | 10.7 | 17.5 | 14.4 | 13.0 | 6.6 | 8.2 | 19.8 | 5.4 | 13.4 | 13.3 | 16.2 | 6.1 |

[1]Fungicides applied in 20 gallons of water per acre (VA, 33 gallons) at the R3 and R5 growth stages. Each treatment was replicated five times in a randomized block design. No phytotoxicity was observed in any treatment at any location.

[2]Significant differences are indicated at the 5.0% level using the Duncan's New Multiple Range Test. Yields with similar letters are not significantly different.

Table 2. Anthracnose Ratings for the Standardized Foliar Fungicide Test, Southern Soybean Disease Workers, 1982.[1]

| Treatment | Location and Disease Rating | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | KY | | | OK | | | | |
| Fungicide and Rate/A. | AR | FL | Pods | Stems | MO | Pods | Stems | TN | TX | Mean |
| Mertect 340-F, 8 fl. oz. | 3.4 c-f[2] | 4.3 b | 3.8 bcd | 4.8 de | 5.3 a | 1.6 b | 4.6 bcd | 4.7 b | 2.0 cd | 3.87 bcd |
| Du-Ter 30F, 4 oz. ai | 2.0 g | 1.8 cde | 3.0 cd | 3.4 g | 4.8 a | 1.0 b | 3.8 d | 3.5 e | 0.6 e | 2.61 f |
| Bravo 500, 3 pt. | 3.2 def | 2.7 cd | 3.2 cd | 4.0 efg | 5.8 a | 1.4 b | 5.0 bc | 4.1 c | 1.4 d | 3.43 cde |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 2.8 efg | 1.8 cde | 3.8 bcd | 5.4 cd | 6.0 a | 1.4 b | 5.0 bc | 3.9 cd | 0.6 e | 3.27 c-f |
| Topsin-M 70WP, 8 oz. | 4.0 bcd | 2.7 cd | 4.0 bc | 4.2 ef | 5.0 a | 1.0 b | 4.8 bcd | 3.5 e | 0.6 e | 3.26 c-f |
| TPTH 50WP, 8 oz. | 2.2 g | 1.6 de | 2.8 d | 3.4 g | 5.5 a | 1.0 b | 4.0 cd | 3.5 e | 0.6 e | 2.71 ef |
| Difolatan 4F, 2 pt. | 4.0 bcd | 4.2 b | 3.2 cd | 4.2 ef | 6.0 a | 1.4 b | 5.4 b | 3.9 cd | 2.2 bc | 3.91 bc |
| Super Tin 4L, 7 fl. oz. | 2.6 fg | 1.2 e | 2.8 d | 3.8 fg | 6.0 a | 1.0 b | 4.8 bcd | 3.6 de | 0.6 e | 2.89 ef |
| EL-228 .33EC, 40 g ai | 4.4 b | 2.4 cd | 4.4 b | 6.2 b | 5.8 a | 3.0 a | 7.0 a | 4.7 b | 2.8 ab | 4.34 b |
| Benlate 50WP, 8 oz. | 3.6 b-e | 2.8 c | 3.2 cd | 4.6 ef | 4.8 a | 1.0 b | 4.2 cd | 3.4 e | 0.6 e | 3.10 def |
| Topsin-M 4F, .35 lb. ai | 4.2 bc | 2.6 cd | 3.2 cd | 4.4 ef | 5.0 a | 1.2 b | 5.4 b | 4.2 c | 0.6 e | 3.39 c-f |
| Untreated check | 6.4 a | 5.8 a | 6.8 a | 8.0 a | 6.0 a | 2.8 a | 6.8 a | 8.6 a | 3.4 a | 6.06 a |
| C. V. (%) | 19.1 | 28.7 | 19.8 | 11.6 | 15.2 | 28.1 | 15.0 | 5.4 | 43.9 | 18.1 |

[1]Disease ratings 0 to 9 where 0 = no disease symptoms and 9 = severe disease injury (90% or greater area showing symptoms). Disease ratings made on following dates: AR - 10/14, FL - 9/27, KY - 9/29, MO - 10/13, OK - 10/27, TN - 10/15, and TX - 9/29. Anthracnose was also found in trace amounts in LA.

[2]Significant differences are indicated at the 5% level using the Duncan's New Multiple Range Test. Ratings with similar letters are not significantly different.

Table 3. Pod and Stem Blight Ratings for the Standardized Foliar Fungicide Test, Southern Soybean Disease Workers, 1982.[1]

| Treatment | Location and Disease Rating | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | KY | | | | | |
| Fungicide and Rate/A. | AR | FL | GA | Pods | Stems | LA | NC | VA | Mean |
| Mertect 340-F, 8 fl. oz. | 5.4 bcd[2] | 2.5 b | 3.2 a | 3.6 ab | 5.6 a | 6.6 a | 2.0 abc | 1.64 bcd | 3.71 b |
| Du-Ter 30F, 4 oz. ai | 2.0 g | 1.2 efg | 2.8 a | 2.8 b | 5.0 a | 5.6 a | 1.4 c | 1.14 def | 2.58 d |
| Bravo 500, 3 pt. | 4.8 cde | 1.8 b-e | 2.6 a | 3.2 ab | 5.2 a | 6.0 a | 2.6 ab | 0.92 f | 3.27 bcd |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 3.6 ef | 1.1 efg | 3.0 a | 2.6 b | 5.0 a | 6.6 a | 2.2 abc | 1.78 abc | 3.15 bcd |
| Topsin-M 70WP, 8 oz. | 5.6 bcd | 2.1 bcd | 2.8 a | 3.0 ab | 5.4 a | 6.2 a | 3.0 a | 1.46 c-f | 3.62 b |
| TPTH 50WP, 8 oz. | 2.6 fg | 0.8 fg | 2.6 a | 3.2 ab | 5.4 a | 5.6 a | 1.8 bc | 1.12 def | 2.69 cd |
| Difolatan 4F, 2 pt. | 6.0 bc | 2.4 bc | 2.6 a | 3.6 ab | 5.6 a | 6.6 a | 2.0 abc | 1.52 cde | 3.67 b |
| Super Tin 4L, 7 fl. oz. | 3.2 fg | 0.7 g | 2.6 a | 2.6 b | 5.2 a | 6.2 a | 1.8 bc | 1.34 c-f | 2.82 bcd |
| EL-228 .33EC, 40 g ai | 6.4 b | 1.4 d-g | 2.8 a | 3.6 ab | 5.4 a | 5.2 a | 2.2 abc | 2.22 a | 3.53 bc |
| Benlate 50WP, 8 oz. | 4.6 de | 1.6 c-f | 2.8 a | 2.6 b | 5.2 a | 5.8 a | 2.6 ab | 1.08 ef | 3.20 bcd |
| Topsin-M 4F, .35 lb. ai | 6.4 b | 1.6 c-f | 2.8 a | 3.0 ab | 5.2 a | 6.6 a | 1.4 c | 1.72 abc | 3.52 bc |
| Untreated check | 9.0 a | 3.6 a | 2.8 a | 4.0 a | 5.8 a | 6.8 a | 3.0 a | 2.16 ab | 4.61 a |
| C. V. (%) | 19.5 | 34.5 | 22.7 | 22.5 | 10.9 | 18.6 | 33.4 | 24.9 | 21.8 |

[1] Disease ratings 0 to 9 where 0 = no disease symptoms and 9 = severe disease injury (90% or greater area showing symptoms). Disease ratings made on following dates: AR - 10/14, FL - 9/27, GA - 11/10, KY - 9/29, LA - 10/21, NC - 10/15, and VA - 11/11. Light and variable amounts of pod and stem blight were also noted in OK.

[2] Significant differences are indicated at the 5% level using the Duncan's New Multiple Range Test. Ratings with similar letters are not significantly different.

Table 4. Brown Spot Ratings for the Standardized Foliar Fungicide Test, Southern Soybean Disease Workers, 1982.[1]

| Treatment | Location and Disease Rating | | | | | |
|---|---|---|---|---|---|---|
| Fungicide and Rate/A. | FL | MD | MO | NC | TN | Mean |
| Mertect 340-F, 8 fl. oz. | 2.6 ab[2] | 7.5 a | 4.5 a | 2.6 abc | 4.8 bc | 4.40 b |
| Du-Ter 30F, 4 oz. ai | 2.0 bcd | 6.5 a | 3.5 a | 2.8 ab | 4.1 cd | 3.78 bc |
| Bravo 500, 3 pt. | 0.9 e | 5.2 a | 3.8 a | 1.6 bc | 4.1 cd | 3.12 c |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 1.5 cde | 6.7 a | 5.0 a | 2.2 bc | 4.7 bc | 4.02 bc |
| Topsin-M 70WP, 8 oz. | 1.2 de | 6.6 a | 3.5 a | 2.4 abc | 3.6 d | 3.46 c |
| TPTH 50WP, 8 oz. | 1.5 cde | 5.5 a | 4.3 a | 2.2 bc | 4.2 cd | 3.54 bc |
| Difolatan 4F, 2 pt. | 2.2 bc | 6.1 a | 4.5 a | 1.4 c | 4.4 bcd | 3.72 bc |
| Super Tin 4L, 7 fl. oz. | 1.8 cd | 5.7 a | 4.5 a | 2.8 ab | 4.1 cd | 3.78 bc |
| EL-228 .33EC, 40 g ai | 1.3 de | 6.0 a | 4.0 a | 2.8 ab | 5.1 b | 3.84 bc |
| Benlate 50WP, 8 oz. | 1.7 cde | 5.7 a | 3.5 a | 2.2 bc | 3.6 d | 3.34 c |
| Topsin-M 4F, .35 lb. ai | 1.3 de | 5.9 a | 3.5 a | 2.8 ab | 4.5 bc | 3.60 bc |
| Untreated check | 3.3 a | 7.4 a | 5.0 a | 3.6 a | 8.9 a | 5.64 a |
| C. V. (%) | 31.2 | 24.8 | 24.3 | 34.9 | 12.9 | 15.9 |

[1]Disease ratings 0 to 9 where 0 = no disease symptoms and 9 = severe disease injury (90% or greater area showing symptoms). Disease ratings made on followings dates: FL - 9/27, MD - 9/14, MO - 9/9, NC - 8/31, and TN - 10/5.

[2]Significant differences are indicated at the 5% level using the Duncan's New Multiple Range Test. Ratings with similar letters are not significantly different.

Table 5. Ratings for Other Diseases for Standardized Foliar Fungicide Test, Southern Soybean Disease Workers, 1982.[1]

| Treatment | Location, Disease, and Rating | | | | | |
|---|---|---|---|---|---|---|
| | Bacterial Blight | Cercospora Leaf Blight | | Downy Mildrew | | Frogeye |
| Fungicide and Rate/A. | FL | AR | MO | GA | NC | FL |
| Mertect 340-F, 8 fl. oz. | 1.0 a[2] | 4.2 cd | 5.5 ab | 2.4 a | 2.6 ab | 0.3 a |
| Du-Ter 30F, 4 oz. ai | 0.7 a | 2.0 g | 3.5 c | 2.9 a | 3.2 a | 0.9 a |
| Bravo 500, 3 pt. | 0.7 a | 3.0 efg | 4.0 bc | 2.2 a | 1.4 c | 0.1 a |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 0.8 a | 3.2 def | 4.8 bc | 2.3 a | 2.4 abc | 0.4 a |
| Topsin-M 70WP, 8 oz. | 0.4 a | 4.2 cd | 4.0 bc | 1.9 a | 3.2 a | 0.3 a |
| TPTH 50WP, 8 oz. | 0.8 a | 2.4 fg | 5.0 bc | 2.6 a | 1.8 bc | 0.5 a |
| Difolatan 4F, 2 pt. | 0.7 a | 5.0 bc | 5.0 bc | 2.0 a | 2.6 ab | 0.4 a |
| Super Tin 4L, 7 fl. oz. | 0.6 a | 3.0 efg | 4.8 bc | 2.4 a | 2.4 abc | 0.4 a |
| EL-228 .33EC, 40 g ai | 0.7 a | 5.4 b | 5.3 ab | 2.8 a | 3.0 a | 0.1 a |
| Benlate 50WP, 8 oz. | 0.7 a | 4.0 cde | 4.0 bc | 2.4 a | 3.0 a | 0.4 a |
| Topsin-M 4F, .35 lb. ai | 0.9 a | 4.6 bc | 4.0 bc | 1.8 a | 2.6 ab | 0.4 a |
| Untreated check | 1.3 a | 9.0 a | 6.5 a | 1.9 a | 3.0 a | 0.5 a |
| C. V. (%) | 51.4 a | 19.4 | 20.3 | 36.2 | 31.6 | 110.3 |

[1]Disease ratings 0 to 9 where 0 = no disease symptoms and 9 = severe disease injury (90% or greater area showing symptoms). Disease ratings made on following dates: AR - 9/29, MO - 9/9, FL (frogeye) - 9/27, GA - 9/13, FL (bacterial blight) - 9/27, and NC - 8/31.

[2]Significant differences are indicated at the 5% level using the Duncan's New Multiple Range Test. Ratings with similar letters are not significantly different. Traces of downy mildew, frogeye, and brown spot were also observed in VA.

Table 6. Percentages of Harvested Seed Infested with Various Disease Fungi, SSDW Standardized Foliar Fungicide Test, Kentucky, 1982.[1]

| Treatment | % Seed Affected | | | | |
|---|---|---|---|---|---|
| Fungicide and Rate/A. | Diaporthe spp. | Cercospora spp. | Alernaria spp. | Other | Healthy |
| Mertect 340-F, 8 fl. oz. | 44.0 ab[2] | 1.6 c | 24.8 bc | 2.8 a | 26.8 ab |
| Du-Ter 30F, 4 oz. ai | 50.8 a | 1.6 c | 19.6 c | 4.8 a | 23.2 ab |
| Bravo 500, 3 pt. | 45.6 a | 3.6 bc | 21.6 c | 4.8 a | 24.4 ab |
| Baycor 50WP, 8 oz. + Agri-dex, 1 pt. | 32.4 abc | 2.0 c | 25.2 bc | 6.0 a | 34.4 a |
| Topsin-M 70WP, 8 oz. | 36.0 abc | 2.0 c | 22.8 bc | 3.6 a | 33.6 a |
| TPTH 50WP, 8 oz. | 39.2 abc | 0.8 c | 23.2 bc | 6.4 a | 30.4 a |
| Difolatan 4F, 2 pt. | 38.8 abc | 1.6 c | 19.6 c | 5.6 a | 34.4 a |
| Super Tin 4L, 7 fl. oz. | 36.4 abc | 3.2 c | 26.8 bc | 4.8 a | 28.8 ab |
| EL-228 .33EC, 40 g ai | 37.6 abc | 12.0 a | 19.2 c | 6.8 a | 24.4 ab |
| Benlate 50WP, 8 oz. | 25.2 bc | 3.2 c | 40.0 ab | 4.4 a | 27.2 ab |
| Topsin-M 4F, .35 lb. ai | 33.2 abc | 2.0 c | 32.8 abc | 5.6 a | 26.4 ab |
| Untreated check | 38.0 abc | 8.4 ab | 29.6 abc | 8.0 a | 16.0 b |
| Benlate 50WP, 2 lb. (R6 only) | 20.8 c | 1.2 c | 43.6 a | 4.0 a | 30.4 a |
| Water check | 50.8 a | 10.8 a | 17.2 c | 6.0 a | 15.2 b |
| C. V. (%) | 34.9 | 100.7 | 45.2 | 75.3 | 34.4 |

[1]Fifty seed from each plot were plated onto acidified potato dextrose agar to isolate and determine disease organisms present.

[2]Significant differences are indicated at the 5% level using the Duncan's New Multiple Range Test. Means with similar letters are not significantly different.

Arkansas (H. J. Walters). Forrest soybeans planted May 18 in 38" rows in Loring silt loam soil, pH 6.5. Fungicides were applied with a Solo mist blower July 21 and August 5 to 4-row plots, 20 ft. long, with sunny, warm weather. Precipitation received in inches per week: 1 - 0.31, 2 - 2.05, 3 - 0.16, 4 - 0.26, 5 - 2.03, 6 - 1.51, 7 - 1.79, 8 - 0.0, 9 - 0.0, 10 - 0.10, 11 - 1.8, 12 - 0.31, 13 - 3.07, and 14 - 1.32. Total water for test was 15.71 inches; furrow-irrigated 1" during week 8. Other pesticides used were Treflan 2 pt./A. May 5 and Lorox pre-emerged band May 18. Previous crop was cotton for the last six years. Soybean stand, 8 plants/row ft. Harvested October 27.

Florida (F. M. Shokes). Davis soybeans planted June 4 in 36" rows in Norfolk l.f.s. soil at pH 6.0-6.5 and containing organic matter, 1-2%; sand, 80-90%; silt, 5-10%; clay, 5-10%. Fungicides were applied with a back-pack sprayer w/2 drops + 1 center nozzle at 48 psi on August 10 and August 24 in warm, sunny weather. Precipitation received in inches per week: 1 - 0.0, 2 - 0.38, 3 - 2.24, 4 - 2.58, 5 - 2.28, 6 - 1.18, 7 - 2.98, 8 - 3.59, 9 - 1.02, 10 - 1.68, 11 - 0.15 + 1.0 irrigation, 12 - 0.93, 13 - 0.5, and 14 - 0.15. Total water for test was 29.61 inches. Traveling gun was used to irrigate during week 11. Other pesticides used were Dimilin at 0.25 oz. ai/A. on August 27 and acephate at 0.25 oz. ai/A. on September 20. Previous crop was soybeans. Soybean stand, 6 plants/row ft. Soybeans were harvested November 10.

Georgia (D. V. Phillips). Davis soybeans planted May 27 in 36" rows in Davidson loam soil. Fungicides were applied with a plot sprayer (3 nozzles per row) at 70 psi on August 13 and August 27. Temperatures were in the mid 80's with overcast skies and light wind. Precipitation received in inches per week: 1 - 0.7, 2 - 0.05, 3 - 0.67, 4 - 0.35, 5 - 0.97, 6 - 0.91, 7 - 1.49, 8 - 2.33, 9 - 0.22, 10 - 0.38, 11 - 0.62, 12 - 0.23, 13 - 0.13, and 14 - 0.7. Total water for test was 9.75 inches. Gun was used in irrigation. Other pesticide used was Lasso on May 27 at 3 lb. ai/A. Previous crops were peanuts and soybeans. Soybean stand, 8 plants/row ft. Soybeans were harvested November 10.

Kentucky (R. E. Stuckey). Williams soybeans planted May 14 in 30" rows in Lanton silty clay loam soil at pH 6.8 and organic matter, 4%; sand, 8%; silt, 60%; clay, 32%. Fungicides were applied with a Solo mist blower at 35 psi on July 27 and August 10 in warm to hot, sunny weather. Precipitation received in inches per week: 1 - 0.03, 2 - 1.13, 3 - 1.06, 4 - 1.48, 5 - 1.82, 6 - 0.09, 7 - 0.13, 8 - 0.21, 9 - 1.86, 10 - 0.94, 11 - 0.64, 12 - 0.72, 13 - 0.61, 14 - 0.24, 15 - 0.86, 16 - 3.55, 17 - 0.0, 18 - 0.77, 19 - 0.32, and 20 - 0.08. Total water for test was 16.54 inches; no irrigation. Other pesticide used was Lasso at 4 qt./A. on March 5. Previous crop was small grain. Soybean stand, 10 plants/row ft. Harvested October 4.

Louisiana (G. T. Berggren). Davis soybeans planted May 26 in 48" rows in silty soil at pH 6.8. Fungicides were applied with a tractor-mounted sprayer at 45 psi on July 28 and August 11 with afternoon showers common, but none on days sprayed. Precipitation received in inches per week: 1 - 0.0, 2 - 0.0, 3 - 0.68, 4 - 0.0, 5 - 1.56, 6 - 0.0, 7 - 0.2, 8 - 0.4, 9 - 0.5, 10 - 2.16, 11 - 1.15, 12 - 3.05, 13 - 1.25, and 14 - 0.0. Total rainfall was 10.95; no irrigation. Other pesticide used was Dual 8E at 2 pt./A. in 15 gallons of water on May 26. Previous crop was soybeans. Soybean stand, 8 plants/row ft. Soybeans were harvested October 28.

Maryland (J. G. Kantzes). Williams soybeans were planted May 21 in 30" rows in sandy loam soil at pH 6.0 and containing organic matter, 1.5%; sand, 40%; silt, 48%; and clay, 12%. Fungicides were applied on August 4 and August 20 with a ground broadcast $CO_2$ sprayer at 50 psi in calm, dry, hot weather. Precipitation received in inches per week: 1 - 0.28, 2 - 0.70, 3 - 2.41, 4 - 1.87, 5 - 1.11, 6 - 0.12, 7 - 0.0, 8 - 0.92, 9 - 2.04, 10 - 0.47, 11 - 1.84, 12 - 2.12, 13 - 0.91, and 14 - 0.0. Total water for the test was 14.79 inches; no irrigation. Other pesticides used were Lasso at 1.5 qt./A. + 0.8 lb. Lorox/A. + 0.18 lb. Dyanap/A. postplant on May 23. Previous crop was soybeans. Soybean stand, 6-8 plants/row ft. Test was harvested on November 7.

Missouri (J. A. Wrather). Forrest soybeans were planted May 13 in 38" rows in sandy loam soil with pH 6.3 and 1.2% organic matter. Fungicides were applied with a $CO_2$ back-pack sprayer at 30 psi on July 28 and August 12 in warm and sunny weather with slight breeze and high relative humidity. Precipitation in inches per week: 1 - 0.75, 2 - 0.5, 3 - 2.3, 4 - 0.28, 5 - 1.5, 6 - 0.1, 7 - 1.5, 8 - 0.0, 9 - 2.0, 10 - 0.0, 11 - 0.0, 12 - 0.2, 13 - 1.1, and 14 - 0.2. Total water for test was 10.43 inches. Flood method of irrigation was used during week 9. Other pesticide used was Treflan at 1.5 qt./A. ppi on May 13. Previous crop was soybeans. Seeding rate was 10 seed per row ft. Test was harvested October 13.

North Carolina (J. D. Taylor). Forrest soybeans were planted on June 15 in 36" rows in sandy loam soil and containing 0.8% organic matter, 82% sand, 15% silt, and 3% clay with pH of 5.9. Fungicides were applied with a tractor mounted sprayer at 40 psi on August 16 and September 2. Weather was sunny with no wind. Precipitation received in inches per week: 1 - 1.84, 2 - 3.5, 3 - 1.82, 4 - 0.32, 5 - 0.0, 6 - 0.0, 7 - 0.0, 8 - 1.21, 9 - 2.15, 10 - 0.0, 11 - 1.82, 12 - 0.03, 13 - 1.67, and 14 - 0.0. Total water for the test was 14.36 inches (8/1-10/31). Other pesticide used was Lasso 4EC, 4 qt./A., preemerged on June 15. Previous crop was soybeans. Soybean stand was 7-9 plants/row ft. Test was harvested November 2.

Oklahoma (R. V. Sturgeon, Jr.). Forrest soybeans were planted June 23 in 36" rows in a sandy loam soil with pH of 6.5. Fungicides were applied with a Solo mist blower back-pack sprayer on August 27 (sunny) and September 14 (cloudy) to 4-row plots, 40 ft. long. Precipitation received in inches per week: 1 - 0.33, 2 - 1.33, 3 - 0.18, 4 - 0.0, 5 -0.0, 6 - 0.03, 7 - 0.66, 8 - 3.0 (irrigation), 9 - 0.0, 10 - 0.56, 11 - 0.21, 12 - 3.0 (irrigation) + 0.44 rain, 13 - 0.68, 14 - 0.0, 15 - 3.0 (irrigation), 16 - 0.40, and 17 - 1.73. Total amount of water for the test was 15.55 inches; flood irrigation was used. Other pesticides used were Treflan at 1.0 pt./A. ppi and 2, 4-D directed spray on July 31. Previous crop was corn. Soybean stand, 6-8 plants/row ft. Soybeans were harvested October 27.

Tennessee (A. Y. Chambers). Forrest soybeans were planted in 38" rows, 40' long, on May 12 in Vicksburg silt loam soil with pH of 6.3 and containing 0.75% organic matter. Fungicides were applied with a high clearance sprayer with 3 nozzles per row, 1 on each side and 1 over the top, at 40 psi on August 3 (sunny, bright, 90°, slight wind) and August 17 (partly cloudy, bright, 85°, 4-5 mph wind). Precipitation received for the test period beginning 7/9/82 in inches per week: 1 - 0.33, 2 - 0.81, 3 - 2.22, 4 - 0.94, 5 - 0.91, 6 - 0.33, 7 - 1.16, 8 - 0.52, 9 - 0.0, 10 - 2.09, 11 - 0.10, 12 - 0.08, 13 - 0.34, and 14 - 0.57. Total water for the test was 19.68 inches (5/12-10/15) and 6.11 inches (8/3-10/15); no irrigation. Other pesticides used were Vitavax M (6.0 fl. oz./bu., seed treatment, 5/12/82), Prowl (0.75 lb. ai/A., broadcast and incorporated, 5/5/82) and Dyanap (6.0 qt./A., preemerged broadcast, 5/13/82). Previous crop was soybeans. Soybean stand, 7-8 plants/row ft. Test was harvested October 15.

Texas (N. G. Whitney). Davis soybeans were planted on May 21 in 32" rows in Morey silt loam soil containing 1.3% organic matter, 13.8% sand, 67.8% silt, and 17.7% clay with pH of 5.3. Fungicides were applied with a Solo mist blower on July 30 (95°F, cloudy) and August 13 (90°F, cloudy). Precipitation received in inches per week: 1 - 0.04, 2 - 0.0, 3 - 0.16, 4 - 2.8, 5 - 0.73, 6 - 2.25, 7 - 0.0, 8 - 2.54, 9 - 1.06, 10 - 0.06, 11 - 1.65, 12 - 0.72, 13 - 0.04, and 14 - 0.0. Total water for test was 12.05 inches; no irrigation. Other pesticides used were Dual (2 lb./A.) on May 21 and Blazer (2 pt./A.) on June 21. Previous crop was soybeans. Soybean stand, 10 plants/row ft. Harvested October 1.

Virginia (D. E. Babineau). Essex soybeans planted on June 25 in 30" rows in fine sandy loam soil containing 1.3% organic matter with pH of 6.3. Fungicides were applied with a $CO_2$ back-pack sprayer using 40 psi on August 17 and 30; weather was clear and humid with no wind and temperatures of 78-80°F. Precipitation received in inches per week: 1 - 0.16, 2 - 0.16, 3 - 1.18, 4 - 0.33, 5 - 1.77, 6 - 2.26, 7 - 3.32, 8 - 0.90, 9 - 0.31, 10 - 0.05, 11 - 0.00, 12 - 0.00, 13 - 1.25, 14 - 0.86, 15 - 0.02, 16 - 0.41, 17 - 0.00, 18 - 1.86, 19 - 2.01, and 20 - 0.00. Total water for test was 16.85 inches; no irrigation. Other pesticides used were Temik 15G at 10 lb./A. in a narrow band at planting and Lasso EC 2 qt./A. + Lorox 50W at 1 lb./A.preemerged. Previous crop was corn. Soybean stand, 5.4 plants/row ft. Harvested November 11.

# ABSTRACT

DISEASE AWARENESS COMMITTEE

H. Ray Smith, Chairman/ Diamond Shamrock Corporation
Dr. Randall Carver/ Consultant
Dr. R.V. Sturgeon/ Oklahoma State University
Mr. M.C. McDaniels/ University of Arkansas
Dr. W.C. Odle/ Diamond Shamrock Corporation
Mr. N. Thomas/ Merck & Company
Mr. J. Julius/ Dupont
Dr. P. Backman/ Auburn University
Dr. D. Stuckey/ University of Kentucky
Dr. W. Winner/ Chevron Chemical Company
Mr. H. McMenney/ Mobay Chemical Company
Dr. G. Berggren/ Louisiana State University

The first meeting of the Disease Awareness Committee was held on April 16, 1982 following the SSDW meeting. The following topics were discussed and specific duties assigned to individuals:

1) Copy of all point systems mailed to all Committee members before June 1, 1982 (R. Carver)

2) Copy of all state weather records for past 5-10 years (N. Thomas)

3) Data on percent soybean irrigated, sprinkler or in-furrow by state (N. Thomas)

4) Data available on point system and meterological systems (P. Backman)

5) Contact Soybean Digest and Delta Farm Press PR representatives and invite to next meeting (M. McDaniels)

6) Prepare a soybean maturity grouping chart for disease resistance (J. Berggren)

7) Contact marketing, research and development, extension and research personnel and formulate list of suggestions that would be helpful in making the grower more aware of soybean diseases.

Our objectives for the June 10th meeting were to:

1) Formulate a compromise point system that could be implemented in 1982 and compare it to the present point systems and standard spray systems in various states.

2) Justify monies to support the applied research by SSDW.

3) Determine the chemicals to be used in the program (BRAVO, Benlate, Mertect, Topsin)

4) Compile suggestions on making growers more aware of soybean diseases and determine distribution.



During the brainstorming session at the June meeting, 52 suggestions were formulated by the Committee that could be helpful in making growers more aware of soybean diseases. From these suggestions, the Awareness Committee and the Steering Committee OK'd six to be accomplished in 1982. They are:

1) Extension sponsored field days supported by Industry

2) Educational meetings during use period or prior to harvest

3) Publish production losses in Plant Disease and Delta Farm Press

4) Encourage economists to include the cost of the disease control in budget

5) Test the compromise point system

6) Place as many educational articles on foliar fungicides in the farm journals before use season and prepare a 2 page insert showing pictures of diseases, stages of growth at application and yield data. R.V. Sturgeon was to prepare this so it may be placed in suggested magazines.

It was determined that these suggestions would not result in a conflict of interest or bias recommendation. Although attempts were made to implement these suggestions, limited success resulted. Dr. Sturegon was fairly successful in generating interest in placing articles in suggested magazines. The greatest accomplishment was testing of the compromise point system and comparison of the compromise point system with various point systems.

A compromise point system (attached) was formulated from input from the Disease Awareness Committee and many others. With the help of Al Chambers and the Standard Foliar Fungicide Committee, the compromise point system was mailed to each participant of the Standard Foliar Fungicide Tests. Thirty-three other cooperators were contacted and asked to conduct trials to compare the compromise point system with the state point system for their respective states and return data on the points resulting in each system along with yields and disease ratings; however, response was very limited.

The information was received and a tabular summary of the data was prepared. The utility of the compromise point system was evaluated by comparing average yield data and disease ratings from BRAVO, Benlate, Mertect and Topsin treated plots with yields and disease ratings for the untreated check.

The data indicated that the compromise point system provided a high degree of probability that a grower could benefit by its use and compared very favorably with the state point systems.

It indicated that a 2.3, 2.1 and 1.8 return on every dollar invested could be expected from the compromise point system, state point system and spray all system, respectively. In these trials, the use of the compromise point system resulted in an overall $6.90/acre profit. The system was correct 56% of the time.

## COMPROMISE POINT SYSTEM

Suggested guide to determine the use of foliar fungicides for disease control in soybeans. Note, foliar fungicides are not recommended for use when yield potential is less than 25 bushels per acre or when heavy weed and insect pressure exists.

If total number of points is 18 or above, fungicides should be applied.

If total number of points is 16-17, fungicide may result in a net return.

If total number of points is 15 or less, fungicides should not be applied.

I. VARIETY

Late = 1
Medium = 3
Early = 5

II. CROPING HISTORY

Soybean previous year = 2
Soybean more than one year = 3
Other crops previous year = 0

III. PLANTING DATE

Late = 1
Medium = 2
Early = 3

IV. DISEASE PRESENT

Yes = 3
No = 0

V. FIELD DISEASE HISTORY

Present = 2
Not present = 0

VI. MOISTURE

Three days wetness after $R_1$ from rain, dew, fog or sprinkle irrigation = 5

Flood irrigation after $R_1$ = 2

Rainfall or sprinkle irrigation after $R_1$, one day of wetness = 3

VII. PLANTING SEED PRODUCTION

= 4

## RESULTS FROM 1982 SOYBEAN FOLIAR FUNGICIDE TRIALS COMPARING COMPROMISE POINT AND STATE POINT SYSTEMS

| STATE | POINT SYSTEM (1) | I VARIETY 1-3-5 | II CROPPING HISTORY 0-2-3 | III PLANTING DATE 1-2-3 | IV DISEASE PRESENT 0-3 | V FIELD DISEASE HISTORY 0-2 | VI MOISTURE 2-3-5 | VII PLANTING SEED PRODUCTION 4 | TOTAL POINTS | "2" | BUSHEL INCR. 4 FUNG. (3) | 0-9 DISEASE AT HARVEST (4) | RETURN DOLLAR ±/ACRE | PROFIT or LOSS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TN | CPS | 5 | 3 | 3 | 3 | 2 | 5 | 0 | 21 | S | 10.0 | 8.5 | +45.00 | +45.00 |
| | SPS | | | | | | | | | | | | | |
| | CPS | 3 | 2 | 3 | 3 | 2 | 5 | 0 | 18 | S | 2.4 | 8.5 | - 0.60 | - 0.60 |
| MO | CPS | | | | | | | | 16 | M | 5.0 | 6.0 | +15.00 | +15.00 |
| | SPS | | | | | | | | 12 | M | | | | +15.00 |
| KY | CPS | 5 | 0 | 3 | 0 | 0 | 5 | 0 | 13 | N | 1.1 | -- | - 8.40 | + 8.40 |
| | SPS | 3 | 0 | 3 | - | - | 4 | - | 10 | M | --- | -- | | - 8.40 |
| NC | CPS | 5 | 3 | 1 | 0 | 0 | 3 | 4 | 17 | M | 6.5 | 3.0 | +24.00 | +24.00 |
| LA | CPS | 3 | 3 | 2 | 3 | 2 | 5 | 0 | 18 | S | 0.4 | 6.5 | -12.60 | -12.60 |
| AR | CPS | 5 | 0 | 3 | 3 | 0 | 5 | 4 | 20 | S | 3.2 | 7.0 | + 4.20 | + 4.20 |
| | SPS | 3 | 0 | 0 | 2 | 0 | 5 | 0 | 10 | M | | | | + 4.20 |
| TX | CPS | 5 | 2 | 2 | 3 | 2 | 5 | 0 | 19 | S | 0.0 | 3.5 | -15.00 | -15.00 |
| VA | CPS | 5 | 0 | 1 | 0 | 0 | 5 | 4 | 15 | N | 0.0 | 2.2 | -15.00 | +15.00 |
| MD | CPS | 5 | 2 | 2 | 0 | 0 | 5 | 0 | 14 | N | 1.3 | 7.0 | - 7.20 | + 7.20 |
| GA | CPS | 4 | 0 | 3 | 3 | 2 | 5 | 0 | 17 | M | 0.7 | --- | -10.80 | -10.80 |
| FL | CPS | 3 | 3 | 2 | 3 | 2 | 5 | 0 | 18 | S | 0.0 | 5.0 | -15.00 | -15.00 |
| MS | CPS | 5 | 3 | 2 | 0 | 2 | 0 | 0 | 12 | N | 0.0 | -- | -15.00 | +15.00 |
| | SPS | | | | | | | | 14 | N | | | | +15.00 |
| OK | CPS | 3 | 3 | 1 | 3 | 2 | 2 | 0 | 14 | N | 3.9 | 6.0 | + 8.40 | - 8.40 |
| | SPS | | | | | | | | 12 | M | | | | + 8.40 |
| | CPS | 3 | 3 | 2 | 3 | 2 | 2 | 4 | 19 | S | 1.4 | 6.0 | - 6.60 | - 6.60 |
| | SPS | | | | | | | | 18 | S | | | | - 6.60 |
| | CPS | 3 | 3 | 3 | 3 | 2 | 5 | 0 | 19 | S | 10.1 | 6.0 | +45.60 | +45.60 |
| | SPS | | | | | | | | 17 | S | | | | +45.60 |

CPS Profit 6.90/A

(1) CPS= Compromise Point System
SPS= State Point System

"2" S= Should be sprayed
M= May be sprayed

(3) Average yield of BRAVO, Benlate, Mertect, Topsin -vs- Check

## COMPARING CPS -vs- SPS FOR TOTAL POINT, YIELD INCREASE AND DISEASE

| | MISSOURI | | KENTUCKY | | ARKANSAS | | MISSISSIPPI | | OKLAHOMA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CPS | SPS | CPS | SPS | CPS | SPS | CPS | SPS | CPS | SPS | CPS | SPS | CPS | SPS |
| TOTAL | 16 *M* | 12 *M* | 13 *N* | 10 *M* | 20 *S* | 10 *M* | 12 *N* | 14 *N* | 14 *N* | 12 *M* | 19 *S* | 18 *S* | 19 *S* | 17 *S* |
| Yield Increase | 5.0 | | 1.1 | | 3.2 | | -0- | | 3.9 | | 1.4 | | 10.1 | |
| Disease | 6.0 | | --- | | 7.0 | | --- | | 6.0 | | 6.0 | | 6.0 | |
| Profit | $15.00 | $15.00 | $8.40 | --- | $4.20 | $4.20 | $15.00 | $15.00 | --- | $8.40 | --- | --- | $45.60 | $45.60 |
| Loss | --- | --- | --- | $8.40 | --- | --- | --- | --- | $8.40 | --- | $6.60 | $6.60 | --- | --- |

### DOLLAR RETURN/ DOLLAR INVESTED

| | |
|---|---|
| CPS | 2.3 |
| SPS | 2.1 |
| Spray All | 1.8 |

### PROFIT TO THE GROWER

| | |
|---|---|
| CPS | $ 10.45/ A |
| SPS | 10.45/ A |

# EFFECT OF TRIPHENYLTIN HYDROXIDE ON DISEASE AND INSECT CONTROL OF SOYBEAN

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In two successive years triphenyltin hydroxide when applied to soybeans at growth stages R-3 and R-5 significantly reduced incidence of pod and stem diseases and prevented foliar feeding by lepidopterous insects. In 1981, insect larva counts of velvetbean caterpiller (*Anticarsia gemmatalis*), green cloverworm (*Playthpena scabra*), and soybean looper (*Pseudoplusia includens*) were found to be significantly lower in triphenyltin plots than in unsprayed control plots. In 1982, the only insect found was the velvetbean caterpiller but insect counts again were significantly lower. Even though insects were found in the triphenyltin plots, there was little evidence of feeding. Treatments were applied with a Solo mistblower delivering 20 gal/A. All treatments were replicated 4 times in a randomized complete block design.

A standard 15-inch diameter sweep net was used for sampling insects. After 10 successive sweeps in each plot, the insects were placed in a plastic bag, frozen, and held until they were identified and counted. Diseases were rated on an 0 to 9 scale with 9 being most severe. Plots were harvested with a Hege 125 B combine. Beans from each plot were weighed, moisture taken, and yields adjusted to 13% moisture. In each year yields were higher in the triphenyltin plots than in benomyl treated plots due to both insect and disease control. Benomyl treated plots were defoliated by insect feeding as were the untreated control plots.

# STEM CANKER IN TENNESSEE: INFLUENCE OF VARIETIES, FOLIAR SPRAYS, AND PLANTING DATES

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## Abstract

Fifteen soybean varieties and breeding lines were evaluated in 1982 for relative resistance or susceptibility to stem canker. Plantings of the varieties and lines were made at four dates - May 6, May 17, June 1, and June 15. Four varieties exhibited very high resistance to stem canker under the conditions present in the test - Tracy M, York, Bay, and Mitchell 450. Three varieties showed some resistance or tolerance to the disease - Asgrow A6420, Centennial, and FFR 560. Asgrow A5474, Nathan, Bedford, Forrest, and Essex were susceptible and had considerable plant injury. Even with their apparent susceptibility, Asgrow A5474 and Bedford produced acceptable yields. RA 604 and RAX 9 were very susceptible and produced low yields. J77-339 was the most susceptible of all of the soybeans evaluated with almost no yields obtained from 24 plots.

Four plantings at the above dates were made of Bedford variety to evaluate various timings and rates of application of benomyl fungicide for stem canker control. Good control of the disease and yield increases were obtained with fungicide applications made at 7-day or 14-day intervals from three weeks of age until the R5 stage. Applications at the R3 and R5 stages were not effective, but an application of benomyl at one-half the normal rate when plants were about 10 inches high combined with the R3 and R5 applications gave fair control and some yield improvement.

Planting dates did not appear to influence incidence of stem canker greatly. There was a slight reduction in severity of disease injury in the later plantings.

# STEM CANKER IN ALABAMA: THE EFFECT OF VARIETIES AND FOLIAR SPRAYS

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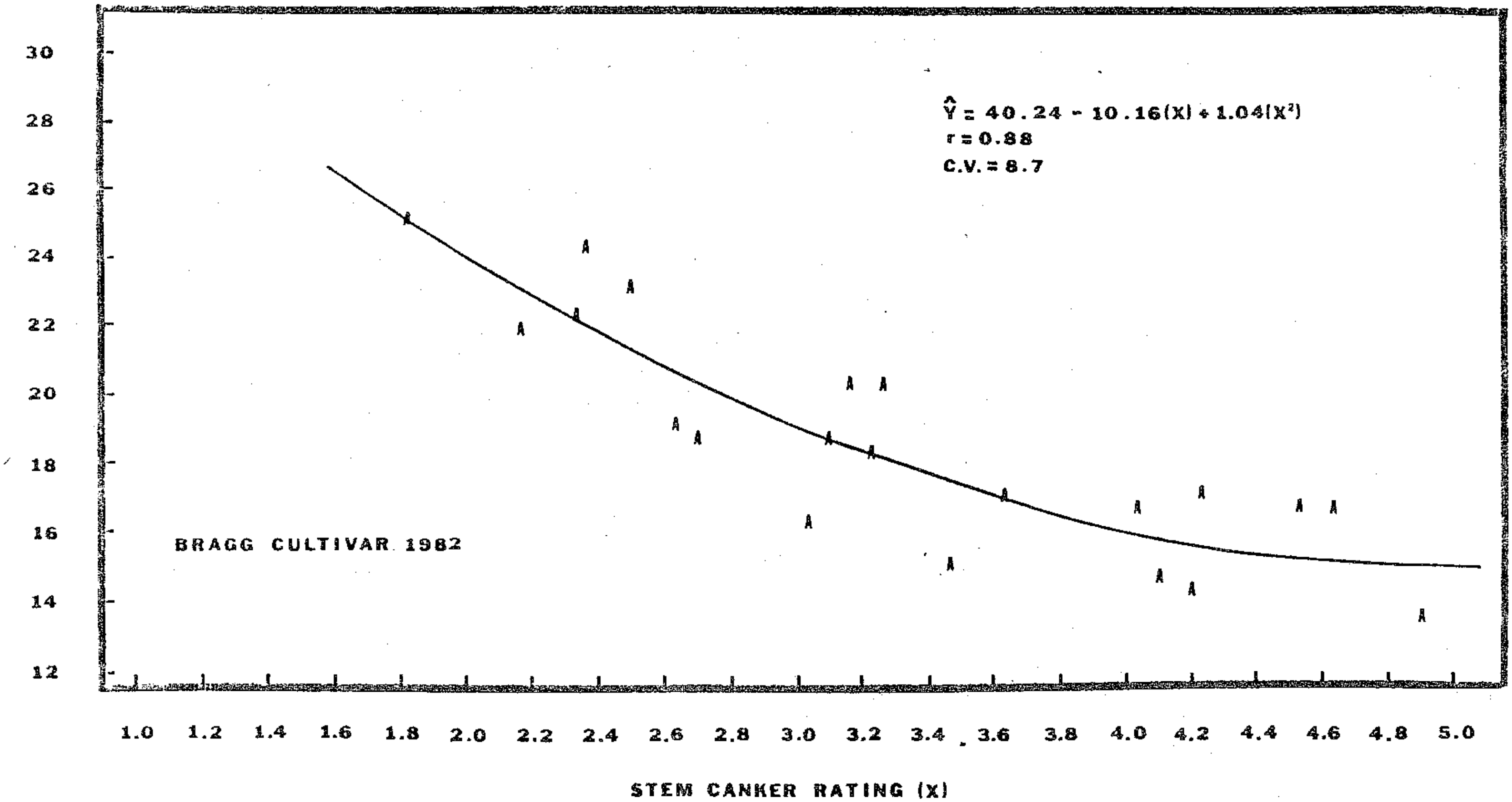
Since 1980, stem canker has occurred throughout the black belt counties of central Alabama, as well as several river bottom areas adjacent to this zone. Disease control and varietal evaluations have been conducted throughout this period.

Foliar Sprays: Many foliar fungicides have been evaluated for efficacy in control of stem canker - only the benzimidazole fungicide Benlate[R] has performed well. Other benzimidazoles, sterol inhibitors, and contact fungicides have exhibited little or no control of the fungus. Addition of Penetrator[R] (oil-surfactant blend) added to the tank mix at 8 fl oz per acre greatly improved Benlate performance in the dry year of 1980, but did not improve Benlate performance in 1982, a wet year. Timing studies revealed that any spray from $V_2$ - $R_6$ would reduce disease, but best results (as yield) occurred when sprays were applied in the late vegetative period. Evaluation of rates of Benlate typically showed improvements in control with higher rates, but reasonable control occurred with from 2 - 4 oz a.i./application.

Varietal Evaluations: Data on relative disease susceptibility of varieties evaluated in 1981 and 1982 reveal that only Tracy and Tracy M were highly resistant, while varieties such as Davis, Braxton, Wright, Coker 156 and Dowling were moderately resistant. The latter group could develop severe disease when grown under drought stress. Late planted varieties suffered less yield damage than did early plantings of the same varieties.

Seed Treatment Tests: Seed treatment of seed produced in infested fields was successful in reducing the degree of infestation of clean fields when these seed were planted. However, disease was still common in the treated lots. No seed treatment protected stem canker-free seed long enough to reduce stem canker in susceptible soybeans planted in infested fields. Seed treatment cannot prevent the establishment of disease in clean fields when planted with infected seed.

Losses: Highly susceptible varieties such as Hutton can lose the entire crop from stem canker. A regression curve for the moderatley susceptible cultivar 'Bragg' relating relative disease severity (log scale) to yield is appended. Disease levels were adjusted using the foliar fungicide Benlate.


$\hat{Y} = 40.24 - 10.16(X) + 1.04(X^2)$
r = 0.88
C.V. = 8.7
BRAGG CULTIVAR 1982
30
28
26
24
22
20
18
16
14
12
1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0
STEM CANKER RATING (X)

Stem Canker in Mississippi
Varietal Response and Isolate Variation

Stem canker was first observed in Mississippi on the Bragg variety in 1973. It has since become a major production problem in many areas of the southeastern United States. Varietal disease ratings have been made by plant pathologists in several states providing information which can be utilized in advising producers.

Research has also shown that variability in virulance exists among isolates. The literature from research conducted in the midwest is not consistent with many observations and research results in the southeastern United States on symptomatology, rapidity of disease development and in seed transmission. Some variability is noted within and between southeastern states in these factors as well as in field observations of varietal susceptibility.

The difference in virulence between isolates can potentially lead to different disease ratings on varietal reactions to stem canker which indicates a need for a standard method for determining the virulence of the isolate involved. Information in the ability of the fungus to be seed transmitted and the relation of seed transmission to disease occurrence in the field would help in determining the need for scouting seed fields for this disease.

1 0 = no [illegible]
2 - 12% plants showing sympt
3 - 25%
4 - 50% infected or dead
5 = 100

# ISOLATION AND IDENTIFICATION TECHNIQUES FOR DIAPORTHE PHASEOLORUM VAR. CAULIVORA

Mark A. Crawford and Paul A. Backman, Agricultural Experiment Station, Auburn University, AL

Soybean Stem Canker, a disease caused by Diaporthe phaseolorum var. caulivora (DPC) has become very serious in the Southern United States. The fungus has been found in soybeans grown from Canada to the Gulf of Mexico. Since Stem Canker (in its severe form) is relatively new to the south, proper diagnosis of the disease has frequently been confused with other soybean diseases.

Isolation techniques are relatively simple requiring the surface sterilization of infected plant parts i.e. stem nodes, pods, and seed. Plant tissue can be surface sterilized in 0.5% hypochlorite for one minute and washed in sterile water before plating in potato-dextrose agar, acidified to ph4.5 with 85% lactic acid (PDA-L). Plates are incubated at 25°C with 12 hour alternating light period for 10 days before identification.

Seed can be checked for DPC infection by surface sterilizing in 0.25% hypochlorite and 0.25% Tween 20 for 4 minutes and washing in sterile distilled water. Seeds are plated on PDA-L with 8 seed per plate and incubated for 14 days as before.

DPC can be distinguished from D. phaseolorum var. sojae (DPS), the causal organism of pod and stem blight and Phomopsis species (Ps) through careful observation of morphological characteristics on PDA-L. Phomopsis is distinguished by a black stroma on the agar surface. Numerous pycnidia are produced containing only alpha spores. DPS will not produce the black stroma, but will form dark striations on the underside of the colony. DPS will produce pycnidia containing both alpha and beta spores. Perithecia are also formed but take longer and are less common than DPC. DPC produces a white tufted mycelium without black stroma. Pycnidia are rare, producing only beta spores. Perithecia are produced abundantly. These criteria have been set using isolates from northern areas. Southern isolates have been found to be more variable than the northern isolates. Work in Mississippi has shown differences in pathogenicity among isolates from different areas of the state. Differences in pathogenicity may be linked to morphological differences observed in the south.

Benlate .5 lb

# SOUTHERN SOYBEAN DISEASE WORKERS

## SCHOLARSHIP ACCOUNT

First American National Bank

[redacted]

2/1/83

| | | |
|---|---|---|
| Balance 12/31/81 | $ | 235.27 |
| Interest | | 12.69 |
| Balance 12/31/82 | $ | 247.96 |

## SAVINGS ACCOUNT

| | |
|---|---|
| Balance 2/1/82 | $15,455.39 |
| Interest | + 217.11 |
| Total | 15,672.50 |
| Purchased 89 Day Treasury Note 12% | -15,000.00 |
| Balance | 672.50 |
| Interest from 89 Day Treasure Notes | +4,355.21 |
| Balance 12/31/82 | $5,027.71 |

[redacted]

J. Dan Smith
Treasurer - SSDW

# SOUTHERN SOYBEAN DISEASE WORKERS

.form Seed Treatment - Uniform Foliar Fungicide - Uniform Nematicide Accounts

First American National Bank
[redacted]

2/1/83

Balance 2/1/82 Account [redacted] $13,751.51

## UNIFORM SEED TREATMENT
(M. C. McDaniel-Chairman)

| Receipts 1982: | Deposit | --Entries | |
|---|---|---|---|
| Chevron Chem. Co. | 4/15/82 | 1 | $ 750.00 |
| N.A.P.B. | 4/15/82 | 1 | 750.00 |
| Cargill | 4/15/82 | 2 | 1,500.00 |
| Kalo Labs | 5/24/82 | 1 | 750.00 |
| Griffin | 5/24/82 | 1 | 750.00 |
| Gustafson | 5/24/82 | 3 | 2,250.00 |
| Agri.Labs | 5/24/82 | 1 | 750.00 |
| Helena Chem. Co. | 5/24/82 | 2 | 1,500.00 |
| Kalo Labs | 5/24/82 | 1 | 750.00 |
| Janssen R & D. Inc. | 6/11/82 | 1 | 750.00 |
| Chipman Inc. | 6/11/82 | 2 | 1,500.00 |
| Olin Chem Co. | 7/02/82 | 3 | 2,250.00 |
| Ciba-Geigy | 7/02/82 | 1 | 750.00 |
| | | Total | $15,000.00 |

| Disbursements 1982: | | |
|---|---|---|
| M.C. McDaniel-Seed Treat. Chairman | 07/05/82 | $ 3,750.00 |
| J&S Plant Consultants | 08/14/82 | 500.00 |
| J&S Plant Consultants | 11/08/82 | 500.00 |
| Miss. State Univ.-Dr. Laughlin | 01/23/83 | 1,000.00 |
| Okla. St. Univ.-Dr. Sturgeon | 01/23/83 | 500.00 |
| Louis. St. Univ.-Dr. Berggren | 01/23/83 | 1,000.00 |
| Texas Rice Imp. Assoc.-Dr. Whitney | 01/23/83 | 1,000.00 |
| Univ. of Tenn.-Mr. Chambers | 01/23/83 | 1,000.00 |
| Univ. of Florida-Dr. Shokes | 01/23/83 | 1,000.00 |
| Univ. of Ark.-Dr. Hirrell | 01/23/83 | 1,000.00 |
| Univ. of Maryland-Dr. Kantzes | 01/23/83 | 1,000.00 |
| Univ. of Missouri-Dr. Wrather | 01/23/83 | 1,000.00 |
| No. Carolina St. Univ.-Dr. Schmitt | 01/23/83 | 1,000.00 |
| Auburn Univ.-Dr. Gazaway | 01/23/83 | 1,000.00 |
| Univ. of Georgia-Dr. Phillips | 01/23/83 | 1,000.00 |
| Eastern Virg.-Dr. Babineau | 01/23/83 | 1,000.00 |
| | Total | $17,250.00 |

| | |
|---|---|
| Total Collected from 1982 Seed Treat. | $15,000.00 |
| Total disbursements for 1982 Seed Treat. | 17,250.00 |
| Balance 2/1/83 | $-2,250.00 |

# SOUTHERN SOYBEAN DISEASE WORKERS

niform Seed Treatment - Uniform Foliar Fungicide - Uniform Nematicide Accounts

## UNIFORM FOLIAR FUNGICIDE
(A. Y. Chambers & M. Newman Co-Chairmen)

Receipts 1982:

| | Deposit | Entries | |
|---|---|---|---|
| Griffin | 5/24/82 | 1 | $ 3,000.00 |
| Diamond Shamrock | 6/11/82 | 1 | 3,000.00 |
| Merck & Co. | 7/02/82 | 1 | 3,000.00 |
| Mobay Chem. Corp. | 7/02/82 | 1 | 3,000.00 |
| Chevron Chem. Co. | 7/02/82 | 1 | 3,000.00 |
| E. I. DuPont & Co. | 7/02/82 | 1 | 3,000.00 |
| American Hoechst | 7/14/82 | 1 | 3,000.00 |
| Pennwalt Corp. | 7/14/82 | 2 | 6,000.00 |
| Eli Lilly & Co. | 7/14/82 | 1 | 3,000.00 |
| Uniroyal Agri.Chem. | 11/03/82 | 1 | 3,000.00 |
| | | Total | $33,000.00 |

Disbursements 1982:

| | | |
|---|---|---|
| Dr. Charles Patrick (by Dr. M. Newman) | 12/19/82 | $ 300.00 |
| J&S Plant Consult.-Dr. Taylor | 1/10/83 | 2,700.00 |
| Univ. of Ark.-Dr. Walters | 1/10/83 | 2,700.00 |
| Univ. of Kentucky-Dr. Stuckey | 1/10/83 | 2,700.00 |
| Univ. of Missouri-Dr. Wrather | 1/10/83 | 2,700.00 |
| Okla. St. Univ.-Dr. Sturgeon | 1/10/83 | 2,700.00 |
| Univ. of Tenn.-Mr. Chambers | 1/10/83 | 2,700.00 |
| Louis. ST. Univ.-Dr. Berggren | 1/10/83 | 2,700.00 |
| Texas A&M Univ.-Dr. Whitney | 1/10/83 | 2,700.00 |
| Univ. of Maryland-Dr. Kantzes | 1/10/83 | 2,700.00 |
| Univ. of Florida-Dr. Shokes | 1/10/83 | 2,700.00 |
| Univ. of Georgia-Dr. Phillips | 1/10/83 | 2,700.00 |
| Eastern Virg.-Dr. Babineau | 1/10/83 | 2,700.00 |
| | Total | 32,700.00 |

| | |
|---|---|
| Total collected from 1982 Unif. Foliar Fung. | 33,000.00 |
| Total disbursed for 1982 | -32,700.00 |
| Balance 2/1/83 | $ 300.00 |

## UNIFORM NEMATICIDE TEST
(Al Wrather-Chairman)

Receipts 1982:

| | Deposit | Entries | |
|---|---|---|---|
| Union Carbide Corp. | 5/24/82 | 1 | $ 4,500.00 |
| FMC Corp. | 6/18/82 | 1 | 4,500.00 |
| Great Lakes Chem. Corp. | 6/18/82 | 1 | 4,500.00 |
| E. I. Dupont & Co. | 11/29/82 | 2 | 9,000.00 |
| | | Total | $22,500.00 |

# SOUTHERN SOYBEAN DISEASE WORKERS

.form Seed Treatment - Uniform Foliar Fungicide - Uniform Nematicide Accounts

## UNIFORM NEMATICIDE TEST
(cont.)

Disbursements 1982:

| | | |
|---|---|---|
| Auburn Univ.-Dr. Kabana | 1/23/82 | $ 2,250.00 |
| Univ. of Ark.-Dr. Wright | 1/23/82 | 2,250.00 |
| Univ. of Fla.-Dr. Dunn | 1/23/82 | 2,250.00 |
| Univ. of Georgia-Dr. Minton | 1/23/82 | 2,250.00 |
| Louis. St. Univ.-Dr.McGawley | 1/23/82 | 2,250.00 |
| Miss. St. Univ.- Dr. Laughlin | 1/23/82 | 2,250.00 |
| Univ. of Missouri-Dr. Wrather | 1/23/82 | 2,250.00 |
| No. Carolina St. Univ.-Dr. Schmitt | 1/23/82 | 2,250.00 |
| Okla. St. Univ.-Dr. Sturgeon | 1/23/82 | 2,250.00 |
| Univ. of Tenn.-Al Chambers | 1/23/82 | 2,250.00 |
| | Total | $22,500.00 |

| | |
|---|---|
| Total collected for 1982 Nematicide Test | $22,500.00 |
| Total disbursements for 1982 Nem. Test | -22,500.00 |
| Balance 2/1/83 | $ 0.00 |

| | |
|---|---|
| Balance 2/1/82 Account [redacted] | $13,751.51 |
| Withdrawal - Deposit into Operation Acct. | -200.00 |
| Balance | $13,551.51 |
| Uniform Seed Treatment | -2,250.00 |
| Uniform Foliar Fungicide | +300.00 |
| Uniform Nematicide Test | 0.00 |
| Balance 2/1/83 | $11,601.51 |

[redacted]

J. Dan Smith
Treasurer SSDW

# SOUTHERN SOYBEAN DISEASE WORKERS

OPERATIONAL ACCOUNT

First American National Bank
[redacted]

2/1/83

| | |
|---|---|
| Balance on 2/1/82 | $ 306.51 |
| **Receipts:** | |
| Slides purchased by various groups | 1,377.75 |
| Hospitality Contributors (19 companies) | 950.00 |
| Registration, Extra Proceedings, Disease Cards | 5,843.00 |
| Deposit from Seed Treatment Account | 200.00 |
| Extra Proceeding Sales | 30.00 |
| Deposit from Seed Treatment Account | 400.00 |
| Total | $ 9,107.26 |

| | |
|---|---|
| **Disbursements:** | |
| Miracle Strip Signs | $ 26.00 |
| Trophy Center | 41.29 |
| Dick Peterman Ad Agency | 8.32 |
| Keith Martin-Graduate Student Expenses | 609.94 |
| John Rupe-Grad. Student Exp.+$100.00 Award | 656.40 |
| Hubert Young-Grad. Student Exp. | 428.42 |
| Diane Smith | 149.00 |
| Gavel Engraving | 2.63 |
| Allan & Aiken Printing ( proceedings) | 1,163.35 |
| Houston Holder-Disease Loss Comm. | 10.60 |

cont.

# SOUTHERN SOYBEAN DISEASE WORKERS

## OPERATIONAL ACCOUNT

Disbursements Cont.

| | |
|---|---|
| Kwik Kopy Printing (program printing) | $ 103.05 |
| U.S. Post Office (stamps) | 20.00 |
| Jerry Berggrand (postage) | 150.00 |
| Trophy Case | 115.92 |
| Square One Copy Center | 18.13 |
| Registration Reimbursement | 10.00 |
| Ramada Inn Ft. Walton Beach (1982 meeting) | 3,353.48 |
| Diane Smith (secretarial work) | 200.00 |
| Jerry Berggren (postage) | 200.00 |
| Secretarial help (Jerry Berggrand) | 200.00 |
| So. Progress Corp. (slide overpayment) | 13.50 |
| Sheraton Airport Inn ( meeting room) | 188.04 |
| Square One Copy Center ( J. Berggrand) | 14.05 |
| Dr. Billy Moore (postage) | 15.00 |
| Diane Smith (secretarial work) | 200.00 |
| Dorthy Andress (IRS Tax Report) | 200.00 |
| Dr. Roy Sturgeon (air fair) | 243.00 |
| Dr. Roy Sturgeon (overpayment on slides) | 13.50 |
| Diane Smith (secretarial work) | 200.00 |
| U.S. Post Office (stamps) | 15.00 |
| Jerry Berggrand (secretarial help) ($25.00 ea.-M. Mayfield, J. Lockwood, J. Ray, & J. Evans.) | 100.00 |
| Jerry Berggrand (postage) | 250.00 |
| Total | $ 8,918.62 |

# SOUTHERN SOYBEAN DISEASE WORKERS

OPERATIONAL ACCOUNT
cont.

| | |
|---|---|
| Receipts | $9,107.26 |
| Disbursements | 8,918.62 |
| Balance 2/1/83 | $ 188.64 |

[redacted]

J. Dan Smith
SSDW Treasurer

# SOUTHERN SOYBEAN DISEASE WORKERS

Slide Account
(Jerry Berggran)

| | |
|---|---|
| Griffin Co. | $ 63.75 |
| Southern Progress Corp. | 42.75 |
| Griffin Co. - Peggy Galloway | 42.75 |
| Kalo - Robert Goss | 8.25 |
| Iowa State Univ. | 11.25 |
| Univ. of Florida - Quincy, Fla. | 20.25 |
| E. I. Dupont & Co. | 52.50 |
| ICI Americas | 42.00 |
| Lilly Research Labs | 27.00 |
| Pioneer Hi-Bred | 42.75 |
| Coker Seed Co. | 42.75 |
| Diamond Shamrock | 245.25 |
| Henry Agri - Scientific | 42.75 |
| John Taylor | 9.00 |
| Roy Sturgeon | 56.25 |
| Univ. of Arkansas | 42.00 |
| Univ. of Arkansas | 42.00 |
| Olin Corp. | 42.75 |
| N.A.P.B. - West Memphis | 42.75 |
| N.A.P.B. | 42.75 |
| Univ. of Delaware | 42.75 |
| Univ. of Florida | 42.75 |
| FMC Corp. | 42.75 |
| N.A.P.B. | 42.75 |
| Brookston Research Center | 42.75 |
| United States Testing Co. | 42.75 |
| Ring Around Seed Co. | 42.75 |
| Clemson Univ. | 42.75 |
| Griffin Corp. | 42.75 |
| Penwalt | 42.75 |
| Univ. of Missouri - Al Wrather | 31.50 |
| Total | $1,377.75 |

Reimbursements:

| | |
|---|---|
| Univ. of Arkansas (double payment) | $ 42.00 |
| Southern Progress Corp. (overpayment) | 13.50 |
| Total | $ 55.50 |

| | |
|---|---|
| Total collected | $1,377.75 |
| Total reimbursed | 55.50 |
| Balance 2/1/83 | $1,322.25 |