Proceedings of the 36th Annual Meeting, Southern Soybean Disease Workers (March 11-12, 2009, Pensacola Beach, Florida)

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Southern Soybean Disease Workers

36th Annual Meeting
March 11 – 12, 2009
Hilton Pensacola Beach Gulf Front
Pensacola, FL

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36th Annual Meeting of the Southern Soybean Disease Workers

March 11-12, 2009

Pensacola, FL

Wednesday, March 11th Session

11:00 am	**Registration**
1:00 pm	**Welcome and Introductions**
	Clayton Hollier
	Contributed Papers
	Moderator – Jason Bond
1:15 pm	**Effects of Diseases on Soybean Yields in the United States 1996 to 2006**
	Allen Wrather and Steve Koenning
1:40 pm	**Evaluation of Soybean Cultivars for Resistance to Soybean Phomopsis Seed Decay in the Mississippi Delta**
	Shuxian Li, Debbie Boykin, Gabriel Sciumbato, Allen Wrather, Grover Shannon, and David Sleper
2:05 pm	**The impact of timing and fungicides on soybean disease management**
	Boyd Padgett, Myra Purvis, Allen Hogan, and Clayton Hollier
2:30 pm	**Foliar Fungicide Impact on Frogeye Leaf Spot, Yield and Net Returns in Mississippi Soybeans**
	Tom Allen, Ben Spinks, Billy Moore, Alan Blaine, and Dan Poston
2:55 pm	**SCE 08: Standards for assessing resistance to SCN**
	T. L. Niblack, G. L. Tylka, and H. Lopez-Nicora

3:20 pm **Break**

3:40 pm **Frogeye Leaf Spot Control Update**

Melvin Newman

Graduate Student Papers
Moderator – Clayton Hollier

4:05 pm **Association of Specific Variables with Severity of Asian Soybean Rust as Assessed by GIS Analysis at the Field Level**

E. P. Mumma, R. W. Schneider, and C. L. Robertson

4:30 pm **Presence and pathogenicity of *Neocosmospora vasinfecta* in Arkansas soybeans**

Amanda Greer, Cliff Coker and Sherrie Smith

6:00 pm Social

7:00 pm Dinner

Thursday, March 12th Session

Breakfast – room B

8:00 am **Registration**

8:15 am **Charcoal Rot – Current Status**

Alemu Mengistu

8:40 am **Discussion Sessions**

SSDW Region-wide Research Needs

Moderator - Allen Wrather

SSDW Region-wide Extension Needs

Moderator – Melvin Newman

Soybean Rust Monitoring Needs

Moderator – Tom Allen

Soybean Disease Atlas Slide Viewing

Moderator – Boyd Padgett

SSDW Business Meeting

Joe Hickey

Sam Atwell

Effects of Diseases on Soybean Yields in the United States 1996 to 2006

Allen Wrather University of Missouri-Delta Center, P.O. Box 160, Portageville, MO 63873; and **Steve Koenning** NC State University, Raleigh, NC 27695.

Research must focus on management of diseases that cause extensive losses especially when funds for research are limited. Knowledge of the losses caused by various soybean diseases is essential when prioritizing research budgets. The objective of this project was to compile estimates of soybean yields suppressed due to diseases for the U.S. from 1996 to 2006. The goal was to provide this information to help funding agencies and scientists prioritize research objectives and budgets. Yield suppression due to individual diseases varied among years. Soybean rust developed in the US first during late-fall 2004, but it did not suppress soybean yields that year. Rust did suppress soybean yields in GA, and SC during 2005, and it suppressed yield in AL, GA, LA, and NC during 2006. Soybean cyst nematode (SCN) suppressed soybean yield in the U.S. more than any other disease each year from 1996 to 2006. The total for soybean yields suppressed due to SCN in the U.S. increased each year from 1996 to 1998 and then declined to 2006. Phytophthora root and stem rot (PRSR) suppressed soybean yields more than any other disease except SCN most years. The impact of PRSR on soybean production has not declined over time. Seedling diseases (caused by *Rhizoctonia*, *Pythium*, *Fusarium*, and *Phomopsis*) ranked third to sixth each year on the list of diseases that most suppressed soybean yield during 1996 to 2006. The impact of seedling diseases was greater in states during years when cool, wet weather developed after soybean planting. Charcoal rot suppressed soybean yields most often in AR, IL, IN, KS, KY, MO, MS, and TN. Sclerotinia stem rot suppressed soybean yields most often in IA, IL, MN, NE, PA, SD, and WI, and it seldom caused yield suppression in other states. Frogeye leaf spot (FLS) was a problem for southern soybean producers from 1996 to 2006. It began to suppress yields in some north central states during 2001, and the yield suppression due to FLS increased in this region from 2003 to 2006. Research and extension efforts must be expanded to provide more preventive and therapeutic disease management strategies to producers in order to reduce disease suppression of soybean yields.

- data can be found online @ the Missouri website

aes.missouri.edu/delta/research/soyloss

Evaluation of Soybean Cultivars for Resistance to Soybean Phomopsis Seed Decay in the Mississippi Delta.

Shuxian Li[1], Debbie Boykin[1], Gabriel Sciumbato[2], Allen Wrather[3], Grover Shannon[3], and David Sleper[3].

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Phomopsis seed decay of soybean is the major cause of poor soybean seed quality in the United States, especially in the mid-southern USA. The disease is caused primarily by the fungal pathogen *Phomopsis longicolla.* To identify soybean lines resistant to this pathogen, 50 soybean cultivars were selected based on the recommendation by Mississippi State University (MSU) Variety Test Program in 2007. Two lines that were previously reported to be resistant in Missouri also were included. Susceptible cultivars, Hill and Williams 82 were used as susceptible checks. Thirty seeds of each line were assayed for incidence of *P. longicolla* and germination rate before planting. A field experiment was established using a randomized complete block design with four replications at Stoneville, Mississippi in May 2007. Plants were inoculated at the R5 stage with a spore suspension (10^{-4}/ml) prepared from a combination of 10 isolates of *P. longicolla* collected from Mississippi. Seeds arbitrarily selected from each replication of each line were collected when the plants were mature. A total of 100 seeds of each line were assayed for the incidence of *P. longicolla* and germination rate. Seed protein and oil concentrations from each line were analyzed.

who has these?

The seeds of soybean lines obtained from MSU without inoculation were generally healthy. Of 50 lines tested, six lines had 100% germination, 30 lines had germination rates with range from 80% to 97%, and 12 lines ranged from 63 to 77%. Only two lines had germination rates of 50% and 53%, respectively. In the seed plating assay, 37 lines had no *P. longicolla* infected seed, 10 and three lines had *P. longicolla* incidence of 3% and 7%, respectively.

Incidence of *P. longicolla* in seeds from inoculated field plots was significantly different ($P \leq 0.05$) among soybean lines. Several lines were identified that had low disease incidence and good seed quality. These lines will be confirmed for resistance in 2009 field trials. Inoculation with *P. longicolla* of soybean lines grown in the field may be a useful method for screening lines for resistance to this pathogen. Collaborative research between USDA and university scientists on germplasm screening is underway to identify resistance sources to Phomopsis seed decay of soybean.

The Impact of Timing and Fungicides on Soybean Disease Management

G.B. Padgett[1], M.A. Purvis[1], A. Hogan[2], and C.A. Hollier[3]

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Diseases can devastate soybean yield and quality if not properly managed. Soybean diseases reduced overall production in Louisiana by 12.1% in 2008. To minimize these losses, producers must implement effective disease management strategies. Components of a successful management strategy incorporate genetic resistance, cultural practices, and fungicide applications. Unfortunately, genetic resistance to all pathogens affecting soybean is not usually present in a single cultivar; therefore, fungicides are needed. The effectiveness of an application is determined by several factors including fungicide choice, sprayer configuration, and timing. In Louisiana, producers routinely make a single fungicide application when soybean is between the R1 (flowering) and R5 (seed initiation) growth stages. Since diseases occur throughout the growing season, it is important to determine what application timing yields the maximum benefit. To determine how timing impacts disease efficacy, studies were conducted from 2003 to 2008 evaluating fungicides and application timing. To accomplish this, field plot tests conducted at the Macon Ridge, Northeast, and Dean Lee Research Stations. Other tests were conducted in producer fields. Selected fungicides were applied during the R1 to R5 growth stages. Diseases were monitored and quantified during the growing season. When possible, tests were harvested to assess treatment effects on yield and quality.

Cercospora foliar blight (*Cercospora kikuchii*) and pod diseases (*Colletotrichum truncatum*, *Diaporthe phaseolorum* var. *sojae*, and *C. kikuchii*) were the most prevalent diseases. Incidence and severity varied among locations and years. Fungicides performed similarly across most tests. In general, applications made at R1 were not as effective as the other application timings. Cercospora foliar blight suppression was similar when fungicides were applied at R3 or R5 growth stages; however, pod disease incidence and severity were lowest when fungicides were applied at R5. Applications made at R3 and R5 resulted in the best overall disease suppression. Yields in fungicide treated plots ranged from 0 to over 15 bu/A more than non-treated plots. Based on the results from these tests, applications between R3 and R5 were most beneficial when disease was present. Applications made at R1 were not beneficial and may be due to the lack of residual activity provided by the fungicide which allow for disease epidemics to continue.

FOLIAR FUNGICIDE IMPACT ON FROGEYE LEAF SPOT, YIELD AND NET RETURNS IN MISSISSIPPI SOYBEANS

T.W. ALLEN[1], B.L. Spinks[2], W.F. Moore[3], M.A. Blaine[4], and D.H. Poston[5].
[1]Delta Research and Extension Center, Mississippi State University, Stoneville, MS; [2]Former Graduate Research Assistant, Department of Plant and Soil Sciences, Mississippi State University, Starkville, MS; [3]Professor Emeritus, Department of Entomology and Plant Pathology, Mississippi State University, Starkville, MS; [4]Department of Plant and Soil Sciences, Mississippi State University, Starkville, MS; [5]Pioneer Hi-Bred International, Inc., Leland, MS.

Field experiments were conducted at 12 locations in the Mississippi Delta in 2003 (5 locations), 2004 (4 locations), and 2005 (3 locations) to evaluate foliar fungicide treatment combinations at either the R3-R4 or R5-R6 growth stages. Generally, off-station irrigated soybean fields were selected that specifically contained maturity group IV and V soybeans with April and May planting dates in addition to on-station research trials conducted at the Delta Research and Extension Center to represent a cross section of common soybean production practices in the MS Delta. Stand-alone fungicide treatments included azoxystrobin (0.11 kg a.i. ha^{-1} as Quadris), chlorothalonil (1.26 kg a.i. ha^{-1} as Bravo WeatherStik), propiconazole (0.16 kg a.i. ha^{-1} as Tilt), and thiophanate-methyl (0.67 kg a.i. ha^{-1} as Topsin M 70WP). Additionally, the insecticide diflubenzuron (0.035 kg a.i. ha^{-1} as Dimilin 2L) was included as a tank mix with some fungicides, alone, and including boron (0.28 kg a.i./ha). Previous observations have reported diflubenzuron has the ability to reduce field levels of frogeye leaf spot. Tank mix combinations of azoxystrobin + chlorothalonil (0.11 kg a.i. ha^{-1} Quadris + 0.84 kg ai ha^{-1} Bravo WeatherStik), azoxystrobin + propiconazole (0.08 kg a.i. ha^{-1} Quadris + 0.12 kg a.i. ha^{-1} Tilt), azoxystrobin + thiophanate-methyl (0.06 kg a.i. ha^{-1} Quadris + 0.45 kg a.i. ha^{-1} Topsin M), azoxystrobin + thiophanate-methyl (0.11 kg a.i. ha^{-1} Quadris + 0.45 kg a.i. ha^{-1} Topsin M), and azoxystrobin + diflubenzoron (0.06 kg a.i. ha^{-1} Quadris + 0.035 kg a.i. ha^{-1} Dimilin, and a second rate of 0.11 kg a.i. ha^{-1} of Quadris) were evaluated at each location with a nontreated control for a total of 13 treatments. Treatments were applied with a tractor-mounted, compressed-air sprayer calibrated to deliver 140 L/ha at 269 kPa using Teejet XR8002VS spray nozzles at all locations. Specific growth stages for fungicide applications were recorded at all locations since extenuating environmental variables delayed application in some cases. All treatments except 0.035 kg a.i./ha diflubenzuron and 0.28 kg a.i./ha boron + 0.035 kg a.i./ha diflubenzuron reduced the level of frogeye leaf spot infection. Averaged across all locations and timings, azoxystrobin alone or in combination with other products increased soybean yield between 282 and 343 kg/ha. Soybean yields with azoxystrobin-based treatments averaged 153 kg/ha higher with R3-4 applications than with R5-6 applications. Net returns vary by commodity prices, however, when calculated using a \$0.224/kg (or \$0.102/lb, and assuming a bushel contains 66 lbs, so essentially \$6.70/bushel) soybean selling price net returns were \$23 and \$31/ha higher than the nontreated control when soybeans were treated with azoxystrobin and azoxystrobin + diflubenzuron, respectively.

Proposal for a standard greenhouse method for assessing soybean cyst nematode resistance in soybean: SCE08 (Standardized Cyst Evaluation 2008).

T.L. Niblack[1], G.L. Tylka[2], P. Arelli[3], J. Bond[4], B. Diers[1], P. Donald[3], J. Faghihi[5], V. R. Ferris[5], K. Gallo[6], R.D. Heinz[7], H. Lopez-Nicora[1], R. Von Qualen[8], T. Welacky[9], and J. Wilcox[7]

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The soybean cyst nematode (SCN) remains the most economically important pathogen of soybean in North America. Despite this, according to surveys conducted in Illinois and reports from nematologists, most farmers do not sample for SCN and believe that the use of SCN-resistant varieties is sufficient to avoid yield losses due to the nematode. This creates problems for sustainable high-yield soybean production either continuously or in rotation because SCN populations vary widely in population densities (numbers) and virulence (ability to reproduce on resistant cultivars), both of which characteristics influence soybean yield; in addition, the word "resistant" on the seed label does not necessarily mean that the cultivar is actually resistant in the traditional meaning of the word. There are currently no widely accepted standards for verifying and labeling a soybean cultivar "SCN resistant."

Several studies have shown that many cultivars marketed as SCN-resistant actually have little or no effective resistance. During the 4th National Soybean Cyst Nematode Conference held in Tampa, FL, in March 2008, approximately 80 members of the assembly discussed and agreed upon a set of standards originally offered by members of a workshop on SCN resistance held in March 2007 in Champaign, IL, for assessing SCN resistance in released cultivars. These standards, which include the use of specific protocols and the host reaction scale proposed by Schmitt & Shannon (Crop Science 32:275-277), will allow direct comparisons of cultivars carrying SCN resistance genes. Adoption of the standards by soybean seed companies will be strictly voluntary, allowing the seed to be labeled as "according to SCE08 standard protocol." Such labeling will permit soybean farmers to make better-informed cultivar choices.

FROGEYE LEAF SPOT CONTROL UPDATE

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Frogeye leaf spot (FLS) of soybean caused by the fungus *Cercospora sojina* has been observed in Tennessee for over thirty years, but did not cause much economic damage until the last eight years (2001-2008). Yield loss estimates during this period averaged 5.1% and ran as high as 8% in 2003. The high yield loss in 2003 can be attributed to frequent rainfall during the critical growth stages (R3-R5) and farming practices that allow old diseased soybean residue to remain on top of the soil, increasing the availability of disease-causing organisms. These factors, coupled with lack of crop rotation and the planting of susceptible varieties, have resulted in considerable yield loss for many producers in recent years.

In a four-year foliar fungicide test at the Research and Education Center at Milan, TN, with susceptible varieties Asgrow 4603 and 4703, five fungicides (Quadris @ 6.2 oz/A, Headline @ 6.0 oz/A, Headline SBR @ 7.8 oz/A, Quilt @ 20 oz/A and Stratego @ 10 oz/A.) were used to spray plots once at the R3 growth stage or twice at R3 and R5. These plots were planted no-till the first week of May each year and irrigated as needed in dry weather. All treatments were randomized and replicated four times in four-row plots 30 feet long with 36 inches between rows. The fungicide treatments were sprayed with a multi-boom "Spider" spray tractor using 20 gallons of water per acre. All fungicide treatments significantly reduced FLS ratings and increased yields each year, except for 2006 when disease pressure was fairly low and yields were high. When all fungicides for the four years were averaged together, the yield increase with one application was 7.74 bu/A over the untreated rows. The four-year average increase for a second application of fungicide was 3.25 bu/A over the first application.

Soybean producers in Tennessee have generally been successful in producing increased yields from the use of one application of a foliar fungicide. Where foliar diseases have built up and adequate rainfall events occur, foliar fungicides have significantly increased profits in most years. Depending on the selling price of their soybeans and the potential for disease, producers might consider one, or possibly two, applications of fungicides. A soybean disease management program with foliar fungicides, along with crop rotation, resistant varieties, adequate moisture and a desirable fertility program, can result in significantly higher yields and profits.

* - vein necrosis syndrome - potential new disease
- this could be the disease that Bogo keeps seeing that has the "scorched" syptomology on the leaf tips or edges of the leaves

Association of Specific Variables with Severity of Asian Soybean Rust as Assessed by GIS Analysis at the Field Level

E. P. Mumma, R. W. Schneider, and C. L. Robertson

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Since the discovery of soybean rust in the continental United States in 2004, there has been considerable interest in epidemiological details related to long distance and local spread of the disease. In this study, a geographical information systems (GIS) analysis was used to investigate within-field disease distribution. Research was focused on determining the extent of spatial and temporal variability of soybean rust with regard to soil nutrients, soil compaction, leaf nutrients, percent canopy coverage, soil moisture, and plant height and their interactions. The study areas included three soybean fields with a total area of about 15 acres. The fields were located close to Baton Rouge, LA. Using a grid pattern, each field was divided into 50 sample sites, and GPS coordinates were recorded at each site. The sites were rated twice during the 2007 growing season to quantitatively assess disease severity. ArcMap was used to perform exploratory data analysis, including correlations among variables, variogram analysis of the spatial structure of each variable, and surface interpolation, with the results being displayed graphically. These results will be presented and discussed.

sample earlier for Bozo's disease

Presence and pathogenicity of *Neocosmospora vasinfecta* in Arkansas soybeans

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Abstract

Neocosmospora Stem Rot caused by the fungal pathogen *Neocosmospora vasinfecta* was positively identified on soybean in Arkansas and is currently being investigated. A Drew County field of DG 4150 soybeans at growth stage (GS) late R5 was observed to be chlorotic, dropping leaves, and dying prematurely. *N. vasinfecta* was isolated from the roots and crowns of plant samples from affected areas. Further investigation revealed *N. vasinfecta* perithecia and similar symptoms on plants in an adjacent field planted to the same variety. Later in the season, plants in a field of Armor 47G7 at GS mid R5 began expressing similar leaf chlorosis, stunting, and leaf drop. Investigations in this field also revealed *N. vasinfecta* perithecia present on the roots and crowns of affected plants. During harvest, plants in heavily affected areas of the fields were gray in color and yields were reduced. Three greenhouse studies were conducted to confirm the pathogenicity of *N. vasinfecta* on soybean. A preliminary study was initiated by placing *N. vasinfecta* agar cultures just below the soil surface, within the crown and root areas of four week old seedlings. Inoculated plants developed reddish colored stem lesions in the crown area. Another greenhouse test using four week old seedlings was inoculated using a root dip method. This test resulted in the inoculated seedlings displaying foliar chlorosis, foliar necrosis, reddish lesions near the crown, and development of *N. vasinfecta* perithecia on the roots, crowns, and nodules. The third greenhouse test was conducted by root dip inoculating one week old seedlings and resulted in the development of reddish lesions, foliar chlorosis, interveinal necrosis, and perithecia on the inoculated soybean plants. The development of the crown lesions, foliar symptoms, and the development of perithecia on the roots, crowns, and nodules on all inoculated plants in all three tests indicate that *N. vasinfecta* is a pathogen on soybeans.

- foliar symptom look like salt damage, this might be Bozo's other disease
- I need to see the roots/stems in the field for distribution

Charcoal Rot – Current Status

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Charcoal rot of soybean is caused by *Macrophomina phaseolina,* the causal agent of seedling blight, root rot, and charcoal rot of more than 500 crop and noncrop species. Charcoal rot ranks second among economically important diseases in the midsouthern USA next to soybean cyst nematode. Several management approaches have been suggested to control charcoal rot. However, these strategies failed to provide adequate control of this disease. The use of resistant cultivars has been suggested as the most effective method to control and soybean genotypes moderately resistant have been identified recently.

Using DT97-4290 line as a resistant parent, populations have been created to evaluate inheritance and identify molecular markers. To date, the parents, F1s, and F2s of 6 populations as well as F3 families for 1 population have been phenotyped using stem and root severity rating. From one F2 population, 339 plants have been phenotyped and an F2 map created. Preliminary genetic and molecular analysis of these populations indicated resistance is quantitative. Molecular analysis of the F2 population identified multiple marker loci significantly associated with resistance. Genetic analysis to date shows that resistance has a low heritability. This indicates resistance may not be easily selected, that multiple genes may be involved, and that the environment has a large influence. These conditions highlight the necessity and importance of identifying molecular markers tightly linked to charcoal rot resistance.

Identification of molecular markers linked to any trait is only as good as the phenotypic characterization. Accurate phenotypic evaluation of a quantitative trait as is (putatively) charcoal rot resistance can be extremely difficult in single-plant evaluations such as in F2 populations. To overcome this limitation, recombinant inbred populations (RIL) have been developed. These RILs will be evaluated using the colony forming unit system which is more quantitative than stem and root severity rating. Determining the genetic control and inheritance of charcoal rot resistance and identifying molecular markers linked to charcoal rot resistance will then be used to developed cultivars with enhanced resistance.

SOUTHERN UNITED STATES SOYBEAN DISEASE LOSS ESTIMATE FOR 2008

Compiled by Stephen R. Koenning Extension Specialist, Department of Plant Pathology, Campus Box 7616, North Carolina State University, Raleigh, NC 27695-7616

Since 1974, soybean disease loss estimates for the Southern United States have been published in the Southern Soybean Disease Workers Proceedings. Summaries of the results from 1977 (6), 1985 and 1986 (2), 1987 (3), 1988 to 1991 (5), 1992 to 1993 (8), 1994 to 1996 (4) have been published. A summary of the results from 1974 to 1994 for the Southern United States was published (7) in 1995, and soybean losses from disease for the top ten producing countries of 1994 was published in 1997(9). An estimate of soybean losses to disease in the US from 1996-1998 was published in 2001, and a summary of losses from 1999-2002 was published online in 2003 (10, 11). In 2005, a summary of disease losses for the US from 1996-2004 was published electronically (12) and in 2006 a summary from 2003 to 2005 was published in the Journal of Nematology (13).

The loss estimates for 2008 published here were solicited from: Edward Sikora in Alabama, Clifford Coker in Arkansas, Robert Mulrooney in Delaware, Jim Marois in Florida, Bob Kemerait in Georgia, Don Hershman in Kentucky, Boyd Padgett in Louisiana, Arvydas Grybauskas in Maryland, Tom Allen in Mississippi, Allen Wrather in Missouri, Steve Koenning in North Carolina, John Damicone in Oklahoma, John Mueller in South Carolina, Melvin Newman in Tennessee, Tom Isakeit in Texas, and Patrick Phipps in Virginia. Various methods were used to obtain the disease losses, and most individuals used more than one. The methods used were: field surveys, plant disease diagnostic clinic samples, variety trials, and questionnaires to Cooperative Extension staff, research plots, grower demonstrations, private crop consultant reports, foliar fungicide trials, and "pure guess". The production figures for each state were taken from the USDA/NASS website in mid January of 2009. Production losses were based on estimates of yield in the absence of disease. The formula was: potential production without disease loss = actual production ÷ (1-percent loss) (decimal fraction).

Soybean acreage in the sixteen southern states covered in this report in 2008 was almost 4,000,000 acres more than in 2007 (1). The 2008 average per acre soybean yield increased from that reported in 2007. In 2008, 670 million bushels were harvested from over 18 million acres in 16 southern states. The overall average (weighted for acreage) for the 16 reporting states was 35.6 bushels/acre in 2008 while the overall average reported in 2008 was 32.7 bushels/acre (Table 1). The 2008 total acres harvested, average yield in bushels per acre, and total production in each state are presented in Table 1. Percentage loss estimates from each state are specific as to causal organism or the common name of the disease (Table 2). The total average percent disease loss for 2008 was 7.46 % or 50.38 million bushels in potential production. In 2008, Tennessee reported the greatest percent loss at 14.82 %, followed by Louisiana at 12.1 %.

The estimated reduction of soybean yields is specific as to the causal organism or the common name of the disease (Table 3). The total reduction in soybean yield due to diseases in the 16 southern states was 50.38 million bushels in 2008 up from the 30.72 million bushels reported in 2007; largely due to increased acreage in 2008 and generally better production conditions in 2008 compared to the drought affected 2007crop. The highest average estimated percent loss was caused by soybean cyst nematode at 1.52 %, followed by charcoal rot and root-knot nematode at 1.27 % and 1.24 % respectively. Losses from Asiatic soybean rust in 2008 were reported only from Florida (2 %), Georgia (0.5 %), South Carolina (0.05 %), Texas (1%), and Alabama (0.5 %). seriously?

Diseases continued to cause significant loss in soybean production throughout the 16 southern states that participated in this disease loss estimate in 2008. It is essential that Extension and University research continue their efforts to discover methods to control these diseases and to educate soybean producers concerning the best methods to prevent yield loss due to soybean diseases.

Table 1. Soybean production for 16 Southern states in 2008.

State	Acres harvested	Yield/acre (bu)	Total production (bu)
Alabama	350,000	35	12,250,000
Arkansas	3,250,000	38	123,500,000
Delaware	193,000	28	5,308,000
Florida	29,000	38	1,102,000
Georgia	415,000	30	12,450,000
Kentucky	1,380,000	34	46,920,000
Louisiana	950,000	33	31,350,000
Maryland	485,000	30	14,550,000
Mississippi	1,960,000	40	78,400,000
Missouri	5,030,000	38	191,140,000
North Carolina	1,670,000	33	55,110,000
Oklahoma	360,000	25	9,000,000
South Carolina	530,000	32	16,960,000
Tennessee	1,460,000	34	49,640,000
Texas	205,000	24	4,920,000
Virginia	570,000	32	18,240,000
Total	18,837,000	Avg. 32.7, Wt. Avg. 35.6	670,840,000

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Table 2. Estimated percentage loss of soybean yield due to diseases for 16 southern states during 2008.

Disease	AL	AR	DE	FL	GA	KY	LA	MD	MS	MO	NC	OK	SC	TN	TX	VA	Avg.
Anthracnose	0.50	0.04	Tr	0.00	2.00	0.02	2.00	0.01	0.38	Tr	0.05	0.00	0.15	1.00	0.00	0.40	0.47
Bacterial diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.10	0.02	0.00	0.00	0.20	0.03
Brown leaf spot	0.00	0.00	0.00	0.00	Tr	0.20	0.00	0.10	Tr	0.00	0.10	1.00	0.25	1.50	0.00	0.20	0.24
Charcoal rot	2.50	2.00	0.25	0.50	1.00	4.00	0.50	0.01	1.88	0.50	0.20	2.50	0..05	3.00	0.00	0.20	1.27
Diaporthe/Phomopsis	0.50	0.03	Tr	0.00	0.00	0.50	2.00	0.00	1.05	0.00	0.20	0.50	0.05	0.50	0.00	Tr	0.38
Downy mildew	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.10	0.25	0.01	0.00	Tr	0.14
Frogeye	Tr	0.00	0.00	2.00	Tr	0.01	0.00	0.00	Tr	0.05	0.05	0.20	0.10	3.00	0.00	0.00	0.45
Fusarium wilt and rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tr	0.00	0.00	Tr	0.00
Other diseases b	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50	0.00	0.20	0.00	0.05	0.00	0.10	Tr	0.12
Phytophthora rot	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	Tr	1.50	0.10	0.00	Tr	0.10	0.00	0.00	0.16
Pod & stem blight	Tr	0.20	0.00	1.00	2.00	0.05	2.00	0.10	0.38	0.00	0.10	0.20	0.10	0.10	0.00	0.20	0.43
Purple seed stain	2.50	0.00	0.00	0.00	Tr	0.01	2.00	0.10	0.75	0.00	0.20	0.20	0.20	0.10	0.20	0.30	0.44
Aerial blight	0.00	0.04	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	Tr	0.00	0.00	0.00	0.07
Sclerotinia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seedling diseases	0.25	0.01	0.01	1.00	Tr	0.50	0.10	0.00	0.75	0.50	0.10	1.00	0.05	1.00	0.00	0.50	0.38
Southern blight	0.00	0.00	0.00	0.00	0.50	0.00	Tr	0.00	0.00	0.00	0.20	0.00	0.20	0.00	0.00	0.10	0.07
Soybean cyst nematode	Tr	1.30	2.00	0.00	Tr	1.50	0.00	1.00	0.25	1.50	4.00	2.00	1.25	4.00	0.00	2.50	1.52
Root-knot nematode	2.00	1.80	1.00	2.00	3.50	0.00	1.00	0.50	Tr	Tr	1.00	0.10	3.00	0.00	0.00	1.50	1.24
Other nematodes c	1.00	0.00	0.00	0.00	1.50	0.00	1.00	0.00	0.00	0.00	0.50	0.00	2.00	0.00	0.00	1.00	0.44
Stem Canker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.01	0.00	Tr	0.01
Sudden death syndrome	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.10	0.50	0.00	0.00	0.00	0.50	0.00	Tr	0.08
Virus d	Tr	0.00	Tr	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.20	0.10	0.75	0.00	0.00	Tr	0.08
Brown stem rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.02
Soybean rust	0.50	0.00	0.00	2.00	0.50	0.00	0.00	0.00	Tr	0.00	0.00	0.00	0.05	0.00	1.00	0.00	0.27
Total disease %	9.75	5.45	3.26	10.00	12.00	6.81	12.10	1.81	6.23	4.55	7.25	8.10	8.47	14.82	1.30	7.40	7.46

a Rounding errors present. Tr indicates Trace.

b Other diseases listed were: red crown rot caused by Cylindrocladium parasiticum in NC, GA, SC, and VA, Cercospora blight MS, and Neocomospora stem blight in AR.

c Other nematodes listed were: Stubby root, Lesion, Sting and common Lance in VA; Columbia lance in NC, SC, and Georgia; and Reniform in AL,AR,GA,NC, SC, and TX.

d Viruses were identified as: SMV in AL, AR, GA, MS, NC, OK,SC, and VA; BPMV AR,DE,LA,MS,NC,OK, and VA; TobRSV in AR, NC, and SC; and PMV in VA.

Table 3. Estimated suppression of soybean yield (bushels in millions) as a result of disease for 16 southern states during 2008.

Disease	AL	AR	DE	FL	GA	KY	LA	MD	MS	MO	NC	OK	SC	TN	TX	VA	loss
Anthracnose	0.07	0.05	0.00	0.00	0.28	0.01	0.71	0.00	0.31	0.00	0.03	0.00	0.03	0.58	0.00	0.08	2.16
Bacterial diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.14
Brown leaf spot	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.01	0.00	0.00	0.06	0.10	0.05	0.87	0.00	0.04	1.23
Charcoal rot	0.34	2.61	0.01	0.01	0.14	2.01	0.18	0.00	1.57	1.00	0.12	0.24	0.19	1.75	0.00	0.04	10.21
Diaporthe/Phomopsis	0.07	0.04	0.00	0.00	0.00	0.25	0.71	0.00	0.88	0.00	0.12	0.05	0.01	0.29	0.00	0.00	2.42
Downy mildew	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.08	0.00	0.06	0.01	0.05	0.01	0.00	0.00	0.22
Frogeye	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.10	0.59	0.02	0.02	1.75	0.00	0.00	2.51
Fusarium wilt and rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other diseases b	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.42	0.00	0.12	0.00	0.01	0.00	0.00	0.00	0.69
Phytophthora rot	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	3.00	0.06	0.00	0.00	0.06	0.00	0.00	3.30
Pod & stem blight	0.00	0.26	0.00	0.01	0.28	0.03	0.71	0.01	0.31	0.00	0.06	0.02	0.02	0.06	0.00	0.04	1.82
Purple seed stain	0.34	0.00	0.00	0.00	0.00	0.01	0.71	0.01	0.63	0.00	0.12	0.02	0.04	0.06	0.01	0.06	2.00
Aerial blight	0.00	0.05	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
Sclerotinia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seedling diseases	0.03	0.01	0.00	0.01	0.00	0.25	0.04	0.00	0.63	1.00	0.06	0.10	0.01	0.58	0.00	0.10	2.82
Southern blight	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.04	0.00	0.00	0.02	0.25
Soybean cyst nematode	0.00	1.70	0.11	0.00	0.00	0.76	0.00	0.15	0.21	3.00	2.38	0.20	0.23	2.33	0.00	0.49	11.55
Root-knot nematode	0.27	2.35	0.05	0.02	0.50	0.00	0.36	0.07	0.00	0.00	0.59	0.01	0.56	0.00	0.00	0.30	5.08
Other nematodes c	0.14	0.00	0.00	0.00	0.21	0.00	0.36	0.00	0.00	0.00	0.30	0.00	0.37	0.00	0.00	0.20	1.57
Stem Canker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.02
Sudden death syndrome	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.08	1.00	0.00	0.00	0.00	0.29	0.00	0.00	1.41
Virus d	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.12	0.01	0.14	0.00	0.00	0.00	0.27
Brown stem rot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06
Soybean rust	0.07	0.00	0.00	0.02	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.00	0.22
Total disease loss	1.32	7.12	0.18	0.12	1.70	3.43	4.32	0.27	5.20	9.11	4.90	0.79	1.75	8.64	0.06	1.46	50.38

a Rounding errors present.

SOUTHERN SOYBEAN DISEASE WORKERS 2008 TREASURY REPORT
Operational Account [redacted] Planters First Bank, Hawkinsville, GA

Receipt Summary	
Interest on Operational Account	$ 20.23
2007 Meeting Registration Receipts	$ 2,065.37
2007 Industry Support	$ 4,000.00
2007 Soybean Disease Atlas Sales	$ 0
Total Receipts	**$ 6,085.60**

Disbursement Summary	
Printing Fees	$ 0
Postage	$ 96.03
2007 Annual Meeting Costs	$ 4,811.48
SSDW Association Awards	$ 1,000.00
Bank Account Fees	$ 0
Total Disbursements	**$ 5,907.51**

SSDW Assets – December 31, 2008	
Beginning Balance – 1/01/08	**$ 3,315.37**
Receipts	**$ 6,085.60**
Disbursements	**$ 5,907.51**
Net Assets – 12/31/08	**$ 3,493.46**
Balance of Operational Account	**$ 3,493.46**

Jason P. Bond [redacted] 12/31/08
SSDW – Vice President

36th Annual SSDW Business Meeting Agenda
March 12, 2009

Call to Order

Approve Agenda

Secretary's Report

Treasurer's Report

Standing Committee Reports

- Steering -- Chair, A. Wrather
- Program -- Chair, C. Hollier
- Nominating -- Chair, M. Newman
- Awards -- Chair, J. Bond
- Disease Loss Estimation -- Chair, S. Koenning
- Graduate Student Competition -- Chair, A. Mengistu
- Educational Resources -- Chair, B. Padget
- Site Selection -- Chair, J. Bond
- Local Arrangements -- Chair, C. Hollier

Old Business

Pass the Gavel to the New SSDW President – Jason Bond

Election of Officers

- Vice President
- Secretary
- Treasurer

New Business

- Amendments to SSDW Operational Procedures
- Site Selection for 2010
- Other

Adjourn