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CROP PRODUCTION

Late-planted Irrigated MG V and Late IV Roundup Ready® Soybean Varieties Cherokee County, 2010

D. P. Delaney and D. Derrick

This trial was planted in northeast Alabama on the Randall and Nick McMichen farm near Centre on June 10. Plots were established with two 15-foot drill passes per cultivar the length of the field, which was approximately 850 feet. Seed was planted no-till into wheat stubble after grain harvest on a Holston fine sandy loam soil with very good moisture. Extremely hot and dry weather was encountered mid-summer. Although the field was subsurface drip irrigated, falling lake levels limited irrigation water availability in late summer. The field was harvested on October 21 using the producer's combine and a weighing grain buggy with the center 20 feet of each strip harvested and weighed. Moderate lodging was noted on one of the varieties and was rated at harvest (see table).

MG V and Late IV Roundup Ready® Soybean Varieties, Cherokee County, 2010

Brand	Variety	Yield [1] *bu/A*	Lodging [2]
Armor	53-Z5	55.5	1
Pioneer	94Y90	54.5	1
Dyna-Gro	32B57	54.1	1
Asgrow	5606	52.9	1
Armor	55A5	52.7	1
Armor	47-G10	51.3	1
Pioneer	95Y20	51.1	1
Progeny	5622	51.0	1
MorSoy	RTS4824	50.8	1
Asgrow	5405	49.4	1
Progeny	5218	49.0	1
Pioneer	95Y70	48.0	1
DeltaKing	5363	48.0	1
MorSoy	RT5388	48.0	1
Dyna-Gro	33X55	46.8	2

[1] Adjusted to 13 percent moisture and 60 pounds per bushel.
[2] Rated at harvest: 1 = almost all plants erect; 5 = more than 80 percent of plants down.

In-Furrow and Foliar Treatments for Iron Chlorosis of Soybeans on High pH Black Belt Soils, 2010

D. P. Delaney, J. Howe, C. C. Mitchell, R. P. Yates, W. Griffith, J. Holliman, and M. Runge

Soybeans planted on high pH soils in the Black Belt area often suffer from iron (Fe) chlorosis due to the unavailability of iron at high pH. Traditionally, producers have managed this problem by using soybean varieties known to have high tolerance to high pH conditions. Due to the recent increase in soybean acres in the Black Belt area, as well as lack of information on rapidly changing varieties, many fields have suffered damage or been abandoned from Fe deficiency. Foliar treatments after damage has been observed have been ineffective, and most soil-applied Fe applications are rapidly converted to unavailable forms or have shown inconsistent results. Research in other high pH areas have shown that in-furrow application of a new form of Fe chelate, Soygreen® (ortho-ortho EDDHA) may be effective in preventing iron deficiency.

Experiments were conducted at four locations on high pH soils in the Black Belt area using ten in-furrow and/or foliar treatments with four replications. Tests were conducted at the Black Belt Research and Extension Center (BBREC) as well as on-farm in Dallas, Perry, and Pickens counties. Plots consisted of four rows, 25 feet long with 30 to 36 inch rows, and were planted with Pioneer 95M50 from mid-May to mid-June. Row width varied by location.

Growth, leaf color/chlorosis using visual and SPAD and Greenseeker meter readings, leaf iron content, yield, and seed weights were measured. Although some treatments visibly increased growth and color in some trials early in the season, extremely hot and dry soil conditions eliminated most differences by late season. The only treatment effects on yield were at the Perry and BBREC locations where in-furrow ammonium sulfate (acidifying) treatments caused poor germination and significantly decreased yield compared to all other treatments. At BBREC, Soygreen® applied in-furrow at 3 and 4 pounds per acre increased 100-seed weight compared to the check, although this was not reflected in yield. The Pickens location (planted mid-June) was not harvested for yield due to poor growth from drought. Harvested yields ranged from 7 to 30 bushels per acre depending on location and treatment.

Yields of Soybeans with Different In-Furrow and Foliar Treatments for Iron Chlorosis on High pH Black Belt Soils, 2010

	Treatment	Rate/A	Application	Yield (*bu/A*)		
				BBREC	Perry	Dallas
1	Untreated	—	—	13.3	17.4	25.3
2	Soygreen	2 lb	In-furrow	13.9	21.8	27.0
3	Soygreen	3 lb	In-furrow	13.9	19.7	29.3
4	Soygreen	4 lb	In-furrow	14.7	20.7	25.9
5	Soygreen	2 lb	Foliar – 2lf	15.4	21.2	29.8
6	Ferrous sulfate	4 lb	Foliar – 2lf	15.1	18.6	26.4
7	Soygreen +	2 lb	In-furrow	15.9	22.0	28.6
	Soygreen	2 lb	Foliar – 2lf			
8	Citraplex +	1 lb	In-furrow	15.0	17.7	29.6
	Citraplex	1 lb	Foliar – 2lf			
9	Citraplex	2 lb	In-furrow	14.9	19.9	29.3
10	Ammon. sulfate	75 lb	In-furrow	7.1	5.8	26.9
	LSD(p=0.10)			***3.5***	***6.5***	***NS***

ROUNDUP READY® SOYBEAN VARIETIES ON HIGH PH SOILS, GREENE COUNTY, ALABAMA, 2010

D. P. Delaney and R. P. Yates

This trial was planted on June 18, 2010 in west central Alabama using conventional tillage on the Allen Clark Farm near Forkland. Each cultivar was planted on a Black Belt clay soil in 12 field-length rows, with a 38-inch row spacing. Soil pH varied within the field: pH on half of the field was 6.4 while on the other half it was 8.1. Consequently, the field was rated and harvested within each soil type. Nitrate-N was similar for the lower and high pH areas at 33 and 32 ppm, respectively, while EC (electrical conductivity) was 0.29 mmhos/cm3 for the lower pH vs. 0.41 mmhos/cm3 for the high pH. Plots were maintained according to standard herbicide, insecticide, and fertility production practices recommended by the Alabama Cooperative Extension System.

Plots were harvested on October 22, 2010 using the producer's combine and a weighing grain buggy. No significant lodging was noted for any variety; however, severe shattering was noted for the earlier (MG IV) varieties. Yields were adjusted to 13 percent moisture and 60 pounds per bushel.

Yellowing from iron chlorosis was observed and was rated on July 26 (see table).

MG LATE IV, V, AND VI ROUNDUP READY® SOYBEANS, GREENE COUNTY, 2010

Brand	Variety	Yield (*bu/A*)[1]		Chlorosis[2]	
		pH=6.4	pH=8.1	pH=6.4	pH=8.1
MorSoy	4802	18.1	12.7	3	6
MorSoy	4914	28.2	15.5	2	8
DeltaKing	5363	38.6	31.2	1	3
Pioneer	95Y70	41.2	40.2	1	1
Croplan	RC5955	26.5	24.2	1	2
Dyna-Gro	DGV61N9	30.5	33.1	2	4
Progeny	6208	27.4	30.2	1	2
Croplan	RC6298	27.3	29.7	1	3
Pioneer	96M60	31.5	28.6	1	3
Progeny	6710	37.8	33.7	1	2

[1] Adjusted to 13 percent moisture and 60 pounds per bushel.
[2] Chlorosis rated on July 26, 2010; AU OVT Rating System: 1 = no chlorosis; 10 = very severe chlorosis with entire plants dead.

MG V TO VI ROUNDUP READY® SOYBEAN VARIETIES, BALDWIN COUNTY, ALABAMA, 2010

D. P. Delaney and R. Petcher

This trial was planted on June 26, 2010 following a wheat grain crop using conventional tillage in southwest Alabama on the George Schwartz Farm near Elberta. Each cultivar was planted in 16 field-length rows (more than 900 feet long) with a 36-inch row spacing using the producer's planter. Plots were maintained according to standard herbicide, insecticide, and fertility production practices recommended by the Alabama Cooperative Extension System. Rainfall was generally plentiful, although short dry spells were encountered during the summer. No significant lodging was noted for any variety. Plots were harvested on November 8, 2010 using the producer's combine and a weighing grain buggy. Yields were adjusted to 13 percent moisture and 60 pounds per bushel.

No significant lodging was noted for any variety. Plots were harvested on November 8, 2010 with a large combine and a weighing grain buggy. Yields were adjusted to 13 percent moisture and 60 pounds per bushel.

MG V TO LATE IV ROUNDUP READY® SOYBEAN VARIETIES, BALDWIN COUNTY, 2010

Brand	Variety	Stem greening[1]	Yield[2] *bu/A*
Armor	55-A5	5	62.6
Progeny	6710RY	2	60.3
Pioneer	96M60	1	58.8
Pioneer	95Y70	1	57.2
Dyna-Gro	V61N9	2	57.1
Croplan	RC6298	3	56.4
Asgrow	5606	4	55.1
MorSoy	RT5388	1	54.4
Progeny	6208	5	50.4

[1] Stem greening: 1 = completely brown, 10 = green.

[2] Adjusted to 13 percent moisture and 60 pounds per bushel.

MG V to VI Roundup Ready® Soybean Varieties, Elmore County, Alabama, 2010

D. P. Delaney, G. Pate, and L. Kuykendall

This trial was planted on May 5, 2010 in central Alabamausing conservation tillage on the Ron Taylor Farm near Tallassee. Each cultivar was planted in four field-length rows (more than 1,000 feet long) with a 40-inch row spacing using the producer's planter with three replications of each variety. Approximately 840 feet of row was harvested from each plot. Plots were maintained according to standard herbicide, insecticide, and fertility production practices recommended by the Alabama Cooperative Extension System. Conditions were generally very hot and dry during the summer, which was reflected in reduced yields. No significant lodging was noted for any variety. Plots were harvested on October 20, 2010 with a large combine and a weighing grain buggy. Yields were adjusted to 13 percent moisture and 60 pounds per bushel.

MG V to VI Roundup Ready® Soybean Varieties, Elmore County, 2010

Brand	Variety	Yield[1]
		bu/A
Pioneer	95Y70	26.9
Asgrow	6730	24.0
NK	68-D4	22.8
Asgrow	5905	22.1
Pioneer	96M60	21.8
Asgrow	6130	21.4
NK	59-B8	19.3

[1] Adjusted to 13 percent moisture and 60 pounds per bushel.

MG V and Late IV Roundup Ready® Soybean Varieties on High pH Soils, Pickens County, Alabama, 2010

D. P. Delaney and W. Griffith

This trial was planted in west central Alabama at the Dee River Ranch near Aliceville on June 8, 2010. Each cultivar was planted in 12 field-length rows with a 30-inch row spacing. Seed was planted no-till into wheat stubble after grain harvest with very good soil moisture on a Sucarnoochee silty clay soil with a pH of 7.7. Poultry litter was applied at 2 tons per acre on June 11. The field was harvested using the producer's combine and yield monitor. Mid-summer weather was extremely dry, which limited plant growth and yield. While iron chlorosis was present, drought masked differences so that accurate ratings could not be made.

MG V and Late IV Roundup Ready® Soybean Varieties on High pH Soils, Pickens County, 2010

Brand	Variety	Yield[1]
		bu/A
Progeny	4807	18.3
DeltaKing	GP-533	29.1
Pioneer	95Y20	26.3
Dyna-Gro	32B57	25.6
MorSoy	RT 4802N	15.0
DeltaKing	DKR4744	26.0
Progeny	4906	27.4
Pioneer	94Y90	25.7
DynaGro	33X55	20.3
MorSoy	RT 4914N	15.3
DeltaKing	DK4968	24.9

[1] Adjusted to 13 percent moisture and 60 pounds per bushel.

INSECT MANAGEMENT

Summary of Alabama Soybean Seed Treatment Studies, 2008-2010

T. Reed, R. Smith, and D. P. Delaney

Since 2008 a total of 16 soybean seed treatment tests have been conducted in Alabama by Extension entomologists. Of these 16 tests, three have had a statistically significant difference (at 90 percent level of certainty) among treatments.

In an on-farm test in Franklin County in 2009 beans were planted behind wheat. The yield in the Insecticide + Fungicide treatment (36.2 bushels per acre) was significantly greater (P>F=0.07 and LSD 0.05 = 1.7) than the yield in the Untreated seed treatment (34.1 bushels per acre) but not significantly different from the Insecticide Only treatment (35.2 bushels per acre). Sampling of plants for main stem girdling damage showed untreated plots averaged 9.8 percent damage while both seed treatments with insecticide were below 0.5 percent damage; this difference was significant (P>F=0.002). This on-farm test in Franklin County was the only test with a significant difference in insect counts/damage among treatments.

In an on-farm test in Lawrence County in 2010 with full-season soybeans, the Fungicide + Foliar Pyrethroid treatment had a significantly (P>F=0.07) greater yield (31.9 bushels per acre) than the Insecticide treatment (29.7 bushels per acre) and the Untreated seed treatment (30.1 bushels per acre).

An Experiment station test at Belle Mina in 2009 had a significantly greater (P>F=0.011) yield in the Fungicide + Foliar Pyrethroid treatment (51.6 bushels per acre) than in the Fungicide Alone (49.5 bushels per acre) treatment or the Fungicide + Insecticide seed treatment (50.1 bushels per acre).

An economic summary of the 16 soybean seed treatment tests is presented in the table. The first treatment in each paired comparison is the treatment which had the highest average yield response of the two. For example, in the first comparison the Insecticide seed treatment averaged 0.42 bushels more per acre than No Treatment, and the number of test comparisons in which the Insecticide treated soybeans averaged 1 or more bushels per acre than the No Treatment was one of six.

Insecticide + Fungicide seed treatments can currently range from $9 to $10.50 per 50 pounds of seed and seeding rates are close to 40 to 50 pounds of seed per acre depending on seed size when planting 120,000 to 125,000 seed per acre.

Gross Returns of Using Different Soybean Seed Treatments in Alabama, 2008-2010

Comparison	Comparisons	Average increase	Gross value of increase [1]	Comparisons with mininum 1 bu/A increase
	no.	*bu/A*	*$*	*no.*
Insectide alone vs. No Treatment	6	0.42	$5.50	1 of 6
Fung.+ Insect. vs. No Treatment	6	1.66	$21.58	6 of 6
Fung.+ Insect. vs. Fung. alone	10	1.46	$18.98	5 of 10
Fung.+ Insect. vs. Insect. alone	5	1.7	$22.10	4 of 5
Fung.+ Foliar Pyreth. vs. Fung. + Insect.	6	0.3	$3.90	1 of 6

[1] Gross value calculated using soybean price of $13 per bushel.

Economic Consequences of Using Insecticidal Seed Treatments on Soybeans in Alabama, 2010

T. Reed, R. Smith, and D. P. Delaney

Five experiment station tests and two on-farm tests were conducted in 2010 to assess the yield response of soybeans to insecticide seed treatments. Experiment station test locations included Tennessee Valley Research and Extension Center (TVREC), Belle Mina; Brewton Agricultural Research Unit (BARU), Brewton; Sand Mountain Research and Extension Center (SMREC), Crossville; Black Belt Research and Extension Center (BBREC), Marion Junction; and Prattville Agricultural Research Unit (PARU), Prattville. On-farm tests took place at two locations in Lawrence County: Mt. Hope and Wheeler.

Planting dates at the research centers were May 12 (TVREC), May 24 (BARU), April 29 (SMREC), June 10 (BBREC), and April 30 (PARU). Plot size varied and was four rows by 20 feet to 140 feet in length. Three treatments were applied at all Experiment station locations except Marion Junction. These were Treatment 1: Fungicide only (Trilex at 1 fluid ounce per 100 pounds seed + 1.5 fluid ounce of Allegiance per 100 pounds seed); Treatment 2: Fungicide (same as Treatment 1) + insecticide (Cruiser 5FS at 1.28 fluid ounce per 100 pounds seed); and Treatment 3: Fungicide (same as Treatment 1) + foliar pyrethroid overspray (bifenthrin at 5 ounces per acre) applied two to four weeks after planting. Marion Junction seed treatments were (1) Fungicide only, (2) Insecticide only, and (3) Fungicide with foliar pyrethroid overspray.

On-farm tests were conducted in north Alabama at two locations. At Wheeler, Croplan 4998 soybean variety was planted on May 7 in 30-inch rows, and at Mt. Hope Asgrow 5606 soybean variety was drilled on June 20 behind wheat with a 7.5-inch row spacing. Treatments at both locations were (1) No Treatment (2) Insecticide (Cruiser 5FS at 1.28 ounces per 100 pounds of seed) and (3) Insecticide + Fungicide (CruiserMaxx at 3 ounces per 100 pounds seed). Plots were 20 to 30 feet wide and 900 to 1100 feet long. There were four to five replications per treatment in a randomized complete block design.

At all locations stand counts were made and insect populations were measured within three weeks of emergence with sweep net and drop cloth sampling.

Yields obtained in Experiment station and on-farm studies are presented in Tables 1 and 2, respectively. There were no significant differences among treatments in any experiment station tests, including Marion Junction which had yields of 35.6, 37.9, and 37.5 bushels per acre in the Fungicide only, Insecticide only, and Fungicide + Foliar Pyrethroid overspray treatments, respectively. There were no significant differences in yield in the on-farm test at Mt. Hope, but at Wheeler the Insecticide + Fungicide Treatment gave a significant yield response. There were no significant differences in stand counts among treatments at any location. Early and late season insect pests were very low at all test locations.

Table 1. Yields[1] in Soybean Seed Treatment Tests Conducted at Experiment Stations

	Location			
Treatment	Belle Mina	Crossville	Brewton	Prattville
Fungicide	14.9	42.3	28.5	9.2
Fung.+ Insectic.	15.3	41.8	33.2	9.1
Fung. + Foliar Pyreth.	16.3	41.3	31.3	9.6
P > F =	***0.21***	***0.71***	***0.29***	***0.67***

[1] Yields are in bushels per acre.

Table 2. Yields[1] in On-Farm Soybean Seed Treatment Tests

	Location	
Treatment	Wheeler	Mt. Hope
Untreated	30.1 b	19.4
Insecticide	29.7 b	19.5
Insectic. + Fung.	31.9 a	20.5
P > F =	***0.07***	***0.24***

[1] Yield is in bushels per acre.

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

Effect of a Complex of Three-Cornered Alfalfa Hoppers and Grasshoppers on Yield of Full-Season Soybeans, Tuscaloosa County, 2010

T. Reed and D. P. Delaney

A study was conducted to assess effects on soybean yield of a complex of three-cornered alfalfa hoppers (3CAH) and grasshoppers (GH) infesting full-season soybeans in early August in Tuscaloosa County. Pest numbers were significantly reduced in pyrethroid-treated plots and maintained in adjacent unsprayed plots. Eight repetitions each of the sprayed and unsprayed treatments were arranged in a randomized complete block design. Each plot consisted of two rows, 100 feet long with 30-inch row spacing; plots were separated by one border row.

The first of three pyrethroid sprays was made on August 4 when beans were in the R5 stage and had 5 percent defoliation. The first pyrethroid spray failed to reduce GH numbers so a different pyrethroid was used for the next two pyrethroid applications made on August 25 and September 9 to the reduced population plots. Applications were made with a CO^2-powered back-pack sprayer. Plots were sampled by ten sweep net sweeps made with a 15-inch diameter net in the even numbered sprayed and unsprayed plots on five different dates. Plots were harvested on October 19 with a small plot combine. Harvested seed were cleaned and weighed and yields determined at 13 percent moisture.

Table 1. Mean Number of Three-Cornered Alfalfa Hoppers, Tuscaloosa County, 2010

Sampling date	—Mean no 3CAH[1]/10 Sweeps— Sprayed [2]	Unsprayed	P>F[2]
8/13	4.0	12.75	0.01
8/25	5.0	18.5	0.038
8/31	1.75	27.25	0.01
9/9	10.75	66.5	0.013
9/13	3.50	38.5	0.014

[1] 3CAH = Three-cornered alfalfa hoppers. More than 90 percent were adults.
[2] Four of the sample plots were sprayed and four were unsprayed.

Table 2. Mean Number of Grasshoppers[1], Tuscaloosa County, 2010

Sampling date	—Mean no GH[1]/10 Sweeps— Sprayed [2]	Unsprayed	P>F[2]
8/13	11.0	10.5	0.88
8/25	8.25	9.75	0.34
8/31	3.25	11.0	0.04
9/9	3.5	8.25	0.01
9/13	1.25	6.0	0.11

[1] GH = Grasshoppers.
[2] Four of the sample plots were sprayed and four were unsprayed.

Table 3. Yields[1] by Repetition in Three-Cornered Alfalfa Hoppers/Grasshopper Study, Tuscaloosa County, 2010

Rep. no.	Sprayed	Unsprayed	Border
1	43.0	48.2	47.1
2	40.8	48.7	44.8
3	34.21	46.8	40.1
4	38.7	40.9	38.9
5	39.9	39.7	33.5
6	29.2	26.1	24.1
7	20.4	22.4	18.53
8	27.3	36.1	30.19

[1]Yields were measured in bushels per acre.

The mean number of 3CAHs collected in sprayed and unsprayed plots on each sampling date are presented in Table 1. During the five sampling dates, numbers of 3CAH averaged five per 10 sweeps in the sprayed plots and 33 per ten sweeps in unsprayed plots.

The mean number of GHs collected in sprayed and unsprayed plots on each sampling date are presented in Table 2. Across all sampling dates GHs averaged 5.5 per 10 sweeps in the sprayed plots and 9.1 per 10 sweeps in the unsprayed plots. Pod feeding by GHs was not detected. At the conculsion of the test, defoliation levels were 5 to 10 percent in sprayed plots and 10 to 15 percent in unsprayed plots.

There was a significant difference in yield (P>F = 0.019) among treatments. Average yields were 38.6 bushels per acre in the sprayed plots, 34.2 bushels per acre in the unsprayed plots, and 34.7 bushels per acre in the buffer rows. Yields were numerically greater in six of the eight sprayed vs. unsprayed repetitions and in eight of eight sprayed vs. buffer row comparisons (see Table 3).

Stink bug and lepidopteran numbers were very low in all the plots (Table 4).

Only even numbered plots were sampled for insects. Across all sampling dates, differences in the number of 3CAHs (per 10 sweeps) in the sprayed vs. unsprayed plots gradually increased as one went from Repetition 2 to Repetition 8 (Table 5). However, yields in the sprayed vs. unsprayed plots that were sampled did not consistently correlate with an increasing number of 3CAHs.

Table 4. Numbers of Additional Insect Pests Present in Test Plots,Tuscaloosa County, 2010

Sampling date/Treatment	—Mean no/10 Sweeps— GSB[1]	BSB	BLB	VBC	SBL
8/13 Sprayed	0	0	1.3	0	1.0
8/13 Unsprayed	0	0	0	0	0.5
8/25 Sprayed	0.8	0	0.8	0	0
8/25 Unsprayed	1.0	0	0.3	0	0.3
8/31 Sprayed	0.5	0	0.3	0	0.3
8/31 Unsprayed	0.3	0	1.8	0.3	0
9/9 Sprayed	0	2.0	0.3	0.3	0.3
9/9 Unsprayed	0.3	1.8	2.0	0	0
9/13 Sprayed	0.5	0	0	0	0
9/13 Unsprayed	1.0	0.5	0	0	0

[1] GSB=green stink bug, BSB = brown stink bug , BLB=bean leaf beetle VBC=velvetbean caterpillar, SBL=soybean looper.

Table 5. Difference in Numers of Three-Cornered Alfalfa Hoppers and Yield by Paired Reps

Repetition	Diff. in no. of 3CAH[1] Sprayed vs unsprayed	Diff. in yield (bu/A) Sprayed vs unsprayed
2 Sprayed	16.8	7.8
2 Unsprayed		
4 Sprayed	25.6	2.4
4 Unsprayed		
6 Sprayed	29.4	-2.8
6 Unsprayed		
8 Sprayed	36.9	8.8
8 Unsprayed		

[1] 3CAH = Three-cornered alfalfa hoppers.

EFFECTS OF DIMILIN ALONE, DIMILIN PLUS BORON, AND DIMILIN PLUS A FUNGICIDE ON SOYBEAN INSECT POPULATIONS AND YIELDS

T. Reed and R. Smith

Three studies were conducted at the Tennessee Valley Research and Extension Center (TVREC) and two studies were conducted at the Gulf Coast Research and Extension Center (GCREC) to determine the yield response of soybeans to foliar applications of Dimilin 2L insect growth regulator and Dimilin in combination with other chemicals. Diamond, a product with a mode of action similar to Dimilin was also evaluated in one test each at TVREC and GCREC. Another Dimilin soybean test plot at the Prattville Agricultural Research Unit in central Alabama was ruined by extremely hot, dry weather. Asgrow 5606 soybeans were planted at TVREC on June 15 in plots consisting of four rows 30 feet long and 30 inches wide. DP 7330 soybeans were planted at GCREC on June 28 in plots that were four rows wide and 50 feet long. All tests had four replications per treatment and were arranged in a randomized complete block design. Insect pest numbers were extremely low in all test plots at TVREC. Low levels of soybean loopers and stinkbugs were present in GCREC tests. When boron was included in a treatment, it was always applied at a rate of 0.25 pound per acre.

Yields obtained in Test 1, Test 2, and Test 3 at TVREC are presented in Tables 1, 2, and 3, respectively.

Test 1 at TVREC showed no significant difference in yield (P>F = 0.22) for plots treated at stage R3 on July 30; however, all treatments that included Dimilin had numerically greater yields than the untreated plots and Karate alone.

Test 2 at TVREC showed a significant difference in yield among treatments (P>F = 0.07). Yields on Dimilin (2 ounces) + boron at R4 (21.5 bushels per acre) and Diamond (6 ouces per acre) at R2 (20.5 bushels per acre) were significantly greater than the yield on the untreated check (17.5 bushels per acre). The three other chemical treatments had yields that were numerically greater than the check.

There was a significant difference in yield (P>F = 0.097) among treatments in Test 3. The addition of Endigo + Quadris or Volium Flexi + Quadris to the Dimilin + boron gave a significant yield response over the untreated plots.

Results of Dimilin tests at GCREC are presented in Tables 4 and 5. In both tests at GCREC there was no significant difference among treatments (Test 1 P>F=0.35and Test 2 P>F= 0.56). However, all chemical treatments in both tests had yields that were numerically greater than the check.

TABLE 1. TEST 1: YIELD RESPONSE OF SOYBEANS TO DIMILIN, TVREC, 2010

Treatment at R3	Rate/A	Yield *bu/A*
Dimilin 2L + Boron	2 oz + 0.25 lb	19.8
Dimilin 2L + Stratego	2 oz + 10 oz	19.5
Dimilin 2L	2 oz	19.4
Dimilin 2L + Karate	2 oz	18.5
Untreated	—	17.9
Karate	1.9 oz	16.9
P > F = 0.223		

TABLE 2. TEST 2: YIELD RESPONSE OF SOYBEANS TO DIMILIN, TVREC, 2010

Treatment	Stage applied	Rate/A	Yield *bu/A*
Dimilin + Boron	R4	2 oz + 0.25 lb	21.5 a
Diamond	R2	6 oz	20.5 ab
Diamond + Boron	R2	2 oz + 0.25 lb	18.8 bc
Diamond + Boron	R4	6 oz + 0.25 lb	18.6 bc
Dimilin + Boron	R2	2.0 oz + 0.25 lb	18.3 bc
Untreated	—	—	17.5 c
P > F = 0.07 LSD (at alpha = 0.1) 2.3 bu/A			

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

TABLE 3. TEST 3: YIELD RESPONSE OF SOYBEANS TO DIMILIN, TVREC, 2010

Treatment at R3	Yield *bu/A*
Dimilin (2 oz) + Boron (0.25 lb) + Volium Flexi (5 oz) + Quadris (6 oz)	19.87a
Dimilin (2 oz) + Boron (0.25) +Endigo (3.5) + Quadris (6 oz)	19.14 a
Dimilin (2 oz) + Boron (0.25 oz)	18.58 ab
Untreated	17.49 b
P > F = 0.097, LSD (at alpha = 0.10) 1.54 bu/A	

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

TABLE 4. YIELD RESPONSE OF SOYBEANS TO DIMILIN, GCREC, 2010

Treatment at R3	Rate/A	Yield *bu/A*
Dimilin	2 oz	53.2
Dimilin + Boron	2 oz + 0.25 lb	52.9
Dimilin + Headline	2 oz + 10 oz	52.3
Karate	1.9 oz	52.2
Dimilin + Karate	2 oz + 1.9 oz	49.6
Untreated	—	47.3
P > F = 0.35		

TABLE 5. TEST 2: YIELD RESPONSE OF SOYBEANS TO DIMILIN, GCREC, 2010

Treatment[1]	Stage applied	Rate/A	Yield *bu/A*
Diamond	R4	6 oz	55.3
Diamond	R2/R3	2 oz	54.5
Dimilin	R2/R3	2 oz	53.0
Diamond	R2/R3	6 oz	52.8
Dimilin	R4	2 oz	51.6
Untreated	—	—	51.3
P > F = 0.56			

[1] 0.25 lb/acre boron added to each treatment except untreated.

Efficacy of Selected Insecticides for Controlling Bean Leaf Beetles and Katydids Infesting Soybeans, 2010

T. Reed

A trial was conducted in north Alabama to compare the efficacy of selected insecticides for controlling bean leaf beetles (BLB) infesting soybeans. A large, uniform population of katydids, which were identified as the common meadow katydid (*Orchelimum vulgare*), was present in the plots. These katydids were also counted along with beneficial arthropods, mainly big eyed bugs (*Geocoris* sp.) and spiders (*Oxyopes salticus*). Treatments are shown in Table 1.

Soybeans were planted in a 7.5-inch row spacing. Plots were 26 feet long and 25 feet wide and were arranged in a randomized complete block design with four replications per treatment. Plants were in the late R2 stage and were 37 to 42 inches tall when treatments were applied on August 21, 2010. Treatments were applied with a CO^2 back-pack sprayer that delivered 14.3 gallons of water per acre using TX 10 Conejet nozzles and 30 psi. Treatments were initiated at 1:30 p.m.; time of application for each treatment is provided in Table 1. A trace of rain fell starting at 4:10 p.m. before the Mustang Max and Karate Zeon treatments could be applied. These two treatments were applied beginning at 6:25 p.m. when plants were deemed sufficiently dry to continue spraying plots. Another 0.33 inch of rain fell on the plots at 10 p.m. on August 21. Plots were sampled at three, nine, and 17 days postapplication by making 10 sweeps per plot using a 15-inch diameter sweep net.

Yields were taken on October 7 and 8 for the Baythroid, Karate Z, and untreated plots in the following manner. A plastic hula hoop with a diameter of 2.4 feet was placed over plants at 10 locations within each of the three treatments and the plants were clipped and bagged. Total area harvested within each of the 12 harvested plots was 37.7 square feet (0.000865 acre). Plants were threshed at Belle Mina using a small plot combine. Soybean seed were then cleaned and weighed and yields were calculated at 13 percent moisture. Statistical analyses were conducted using Statistix 9 software.

Table 1 gives the number of bean leaf beetle adults collected per 10 sweeps in plots. The ANOVA indicated a significant difference among treatments on all three sampling dates (P>F = 0.02, 0.00, and 0.00 for three days after application [DAA], nine DAA, and 17 DAA, respectively). All chemical treatments had significantly fewer BLB than untreated plots on all three sampling dates. There was no significant difference in BLB numbers among chemical treatments on any of the three sampling dates.

Numbers of katydids collected on the three sampling dates are presented in Table 2. The ANOVA indicated that there was a significant difference among treatments on all three sampling dates (P>F= 0.000 for all three dates). All chemical treatments had significantly fewer katydids than untreated plots on all three sampling dates with one exception. The Endigo treatment was not significantly different from the untreated plots at three DAA. The Baythroid 2.3 ounce-per-acre treatment had the lowest number of katydids at three DAA. The species of katydid present in this study was found in several soybean fields in 2010 and may be consuming some soybean foliage.

The mean numbers of big eyed bugs and spiders combined (total beneficials) are presented in Table 3. The ANOVA indicated that there was a significant difference among treatments (P>F =0.000). Untreated plots averaged 2.25 *Geocoris* sp. per 10 sweeps and spiders averaged 1.75 per 10 sweeps at three DAA. All chemical treatments except Leverage 360 plus NIS had a significant reduction in predator numbers. This Leverage 360 treatment had more spiders present than the untreated plots.

Yields obtained in the Baythroid XL, Karate Z and untreated plots are presented in Table 4. The ANOVA indicated that there was a significant difference (P>F = 0.0536) among the three treatments with respect to yield. The percent defoliation in the insecticide treated plots ranged from 5 to 10 percent and was 10 to 15 percent in the untreated plots. Yield differences obtained were not due to the effect of the insecticides on target pests. Differences in yield were likely due to the variability in the size and number of soybean plants within the plots receiving different treatments.

Table 1. Mean Number of Bean Leaf Beetle Adults Per 10 Sweeps, at Three, Nine, and 17 Days Postapplication in Soybeans Treated with Selected Insecticides, Lawrence County, 2010

Treatment	Rate	Time of application	—Bean Leaf Beetles/10 Sweeps— 3DAA	9DAA	17DAA
Untreated	—	—	10.75 a	7.75 a	3.75 b
Mustang Max	4.0 oz/A	6:25 p.m.	2.00 b	1.00 b	0.50 b
Karate Zeon	1.7 oz/A	7:00 p.m.	1.25 b	0.75 b	0.50 b
Endigo ZC	4.0 oz/A	4:00 p.m.	1.25 b	1.00 b	0.5 b
Baythroid XL	2.3 oz/A	3:30 p.m.	1.25 b	0.75 b	0.5 b
Baythroid XL + Orthene	2 oz/A 0.33 lbs/A	2:50 p.m.	1.00 b	0.75 b	0.25 b
Leverage 360 + NIS	2.8 oz/A 0.25% v/v	1:30 p.m.	0.50 b	0.75 b	0.25 b
Leverage 360 + COC	2.8 oz/A 1% v/v	2:05 p.m.	0.00 b	0.00 b	0.25 b

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

TABLE 2. MEAN NUMBER OF KATYDIDS PER 10 SWEEPS, AT THREE, NINE, AND 17 DAYS POSTAPPLICATION IN SOYBEANS TREATED WITH SELECTED INSECTICIDES, LAWRENCE COUNTY, 2010

Treatment	Rate	—Katydids/10 Sweeps—		
		3DAA	9DAA	17DAA
Untreated		9.75 a	8.25 a	4.5 a
Endigo ZC	4.0 oz/A	7.75 a	5.75 b	2.75 b
Mustang Max	4.0 oz/A	4.75 b	3.5 cd	1.75 bc
Karate Zeon	1.7 oz/A	4.5 bc	4.0 c	1.5 cd
Leverage 360 + NIS	2.8 oz/A 0.25% v/v	3.75 bc	3.25 cde	1.75 bc
Baythroid XL + Orthene	2 oz/A 0.33 lb/A	2.50 cde	0.75 e	1.00 cd
Leverage 360+ COC	2.8 oz/A 1% v/v	2.25 de	2.00 def	1.00 cd
Baythroid XL	2.3 oz/A	1.5 e	1.25 e	0.5 d

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

TABLE 3. MEAN NUMBER OF BIG EYED BUGS PLUS SPIDERS PER 10 SWEEPS AT THREE DAYS POSTAPPLICATION IN SOYBEANS TREATED WITH SELECTED INSECTICIDES, LAWRENCE COUNTY, 2010

Treatment	Rate	No. of beneficials 3DAA
Untreated	—	4.00 a
Leverage 360 + NIS	2.8 oz/A 0.25% v/v	3.00 b
Endigo ZC	4.0 oz/A	0.50 c
Mustang Max	4.0 oz/A	0.50 c
Karate Zeon	1.7 oz/A	0.50 c
Baythroid XL + Orthene	2 oz/A 0.33 lb/A	0.50 c
Leverage 360 + COC	2.8 oz/A 1% v/v	0.50 c
Baythroid XL	2.3 oz/A	0.50 c

Means followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

TABLE 4. SOYBEAN YIELDS IN PLOTS INFESTED WITH BEAN LEAF BEETLES AND KATYDIDS AND TREATED WITH SELECTED INSECTICIDES, LAWRENCE COUNTY, 2010

Treatment	Rate/A	Yield *bu/A*
Baythroid XL	2 oz	25.8 a
Karate Zeon	1.7 oz	18.7 b
Untreated		19.6 b

Means followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

Evaluation of Select Insecticides for Soybean Looper Control in Soybeans, Fairhope, Alabama, 2010

R. Smith

Eight insecticides/insecticide combinations were evaluated for efficacy in controlling soybean loopers infesting soybeans at the Gulf Coast Research and Extension Center at Fairhope, Alabama, in 2010. DP 7330 Soybeans (Group 7) were in R3 stage when chemicals were applied on August 31. Plant height was 34 to 38 inches. Chemicals were applied with a Spider Sprayer with flat fan nozzles at a rate of 18 gpa and 45 to 50 psi. Experimental design was a randomized complete block design with four repetitions per treatment. Pre-spray looper counts were made on August 31 and were 19 soybean loopers per 6 row feet. No rainfall occurred for seven days after application. Results are presented in the table.

All chemical treatments except Alias (imidacloprid) provided a significant (P>F=0.0005) reduction in looper numbers. Before looper numbers declined in the untreated plots, they were able to cause significantly (P>F=0.000 with LSD at alpha = 0.10 of 1.9) greater defoliation than occurred in all the chemical treatments. This may have contributed to the significantly (P>F=0.0005 with LSD at alpha = 0.10 of 0.84 bushels per acre) lower yields found in seven of the eight chemical treatments.

Evaluation of Select Insecticides for Soybean Looper Control in Soybeans, Fairhope, Alabala, 2010

Treatment	Rate/A	Yield *bu/A*	SBL no/6 ft. 7DAA [1]	Defoliation % 19DAA
Bifenthrin + Novaluron	25.6 oz	42.0 a	2.3 bc	6.0 bc
Diamond	6 oz	40.2 b	3.0 bc	5.0 cd
Intrepid	5 oz	40.0 b	1.25 c	6.5 bc
Alias	1.5 oz	39.7 b	6.8 a	4.0 d
Diamond + Alias	6 oz + 1.5 oz	39.6 b	4.3 b	5.0 cd
Fanfare + Alias	6.4 oz + 1.5 oz	38.3 c	3.3 bc	5.0 cd
Volium Express	5 oz	38.2 c	3.0 bc	6.5 cd
Untreated	—	36.9 d	7.5 a	21.3 a
Belt	2 oz	36.6 d	3.3 bc	7.5 b

[1] DAA = days after application.

Means in each column followed by the same letter are not significantly different (LSD Test at alpha = 0.10).

DISEASE MANAGEMENT

Soybean Disease Survey, 2010 Summary

E. J. Sikora, J. F. Murphy, K. S. Lawrence, and D. P. Delaney

A statewide soybean disease survey was conducted in 2010, which concluded a three-year project. The hot, dry conditions that prevailed over much of the season resulted in few observations of plant disease. Over 20 fields were monitored for incidence and severity of various foliar diseases and plant viruses in 2010. Results showed that Cercospora blight was the most common disease observed and was found in more than 70 percent of the fields surveyed. Aerial web blight, which had not been observed in the previous two years of the study, was found in more than 52 percent of the fields monitored in 2010. Downy mildew and target spot were each observed in 29 percent of the fields surveyed. Frog-eye leaf spot, Septoria brown spot and southern blight were each observed in less than 5 percent of the fields monitored. Disease severity ranged from trace-to-low levels for all the diseases observed with the exception of two fields each for Cercospora blight and aerial web blight.

Bean pod mottle virus (BPMV) was detected in 27 percent of the fields surveyed with incidence ranging from 16 to 100 percent in affected fields. All fields in which BPMV was detected were located in Marengo, Greene or Pickens counties. Soybean mosaic virus (SMV) was found in 33 percent of the fields surveyed and incidence ranged from 1 to19 percent in affected fields. Tomato spotted wilt virus (TSWV) was not detected in 2010 after being found in approximately 10 percent of fields surveyed in each of the previous two years.

Five unique races of soybean cyst nematode (SCN) were identified among populations collected from various fields in the 2008 and 2009 surveys. These were identified through greenhouse experiments and designated SCN-races 2, 4, 5, 6, and 14. Due to extremely dry soil conditions in 2010, the nematode portion of the survey was not conducted in the final year of the project.

Results from the three-year survey show that soybeans are exposed to multiple pathogens and that incidence and severity of these diseases vary by year depending on prevailing weather conditions. The high incidence of Cercopsora blight every year and the potential damage from diseases such as aerial web blight and soybean rust in some years suggest that a fungicide application would be economical for foliar disease control in certain situations. The appearance of stem canker in 2009 shows the benefit of using stem canker-resistant varieties as well as following a crop rotation program. BPMV, SMV, and TSWV are all insect-transmitted viruses and the relatively high incidence of BPMV and, to a lesser extent, SMV in some fields suggests that researchers should take a closer look at their impact on soybean production in Alabama. The same is true for reniform nematodes, which were found in approximately 30 percent of the fields surveyed in both 2008 and 2009. The identification of five SCN races should help growers with SCN infestations in choosing the appropriate SCN-resistant varieties for their field.

Monitoring Soybean Sentinel Plots for Early Detection of Soybean Rust, 2010 Summary

E. J. Sikora, D. P. Delaney, M. Delaney, R. Petcher, B. Dillard, W. Griffith, D. Derrick. E. Schavey, and R. Yates

A season-long monitoring program for soybean rust was conducted in Alabama in 2010. The purpose of this program was to provide an early warning system for soybean growers in the state. The program involved bi-weekly monitoring of 20 soybean sentinel plots and 15 kudzu sentinel patches located throughout the state. Mobile scouting of random commercial soybean fields and patches of kudzu throughout the state was also conducted.

The relatively, long, cold winter prevented soybean rust from surviving successfully in south Alabama in 2010. This extended winter period was followed by an abnormally hot, dry summer with many parts of Alabama experiencing drought conditions throughout the growing season. These weather patterns were unfavorable for growing soybeans, in general, but also unfavorable for the development of soybean rust. The disease was detected at very low levels in soybean sentinel plots in Baldwin and Washington counties in late May, but the disease was not detected again until September. The late development of the disease greatly reduced the risk of the pathogen damaging the soybean crop in Alabama.

Soybean rust was detected in only seven counties in Alabama in 2010. This was significantly less than the 67 counties reporting the disease in 2009.

We suspect that less than 20 percent of the soybean acreage in Alabama was sprayed with a fungicide to protect against soybean rust in 2010. This was a dramatic drop from the estimated 70 percent of the acres sprayed in 2009 when the disease was more prevalent. There were no reports of yield loss from soybean rust in Alabama during 2010.

One benefit of the monitoring program is that approximately 80 percent of the soybean crop did not receive an unnecessary fungicide application due to the threat of soybean rust. This resulted in the savings of an estimated $3 million in fungicide applications in 2010 as compared to the cost of fungicide applications in 2009.

Large Scale Fungicide Strip Test Evalutions, Results from Year One of Three

E. J. Sikora, D. P. Delaney, and K. S. Lawrence

A three-year study was initiated in 2010 to determine the effect of a single fungicide application on foliar disease development and crop yield. Disease development and yield were compared from fungicide-treated and untreated field sections in five soybean fields of various sizes throughout Alabama. Fungicides and time of application (growth stage) varied. All other production practices (i.e. insecticides, fertilizer) were the same.

Results from the first year of the study are reported in the table, which also includes details about the location of the study sites, seed type planted, fungicide application and rate, and area harvested.

There were only slight differences in yield in four of the five trials. Lower yields in the fungicide-treated area at the More farm may have been due to high incidence of charcoal rot observed in the treated area. Foliar disease pressure was minor at all locations due to extremely dry conditions. Aerial web blight was observed in all trials but only at trace levels that would not be expected to reduce yields.

Large Scale Fungicide Strip Test Evalutions (Year 1 of 3)

Location	———Yield (bu/A)———	
	Treated	Untreated
Diller farm [1]	28.1	28.3
Nichols farm [2]	41.4	39.9
Dawkins farm [3]	42.0	43.5
Pegues farm [4]	56.7 [5]	56.4
More Farm [6]	29.0	34.6

[1] Diller Farm in Hale County; Asgrow 5905 planted; Sprayed Sept. 9, 2010 at R5 growth stage with Stratego 10 oz/A; Area harvested = 0.5 acre.

[2] Nichols Farm in Perry County; Pioneer 95Y70 planted; Sprayed July 30, 2010 at R3 growth stage with Quilt at 14 oz/A; Area harvested = 1.38 acre.

[3] Dawkins Farm in Blount County; Pioneer 95M80 planted; Sprayed on Aug. 25, 2010 at R4 growth stage with Quadris at 6 oz/A; Area harvested = 0.5 acre.

[4] Pegues Farm in Baldwin County; DP 7330 RR planted; Sprayed Aug. 9, 2010 at R2 growth stage with Headline 6 oz/A or Headline 6.0 oz/A plus Topguard at 7 oz/A; Area harvested 6.3 ft X 295 ft.

[5] The test included two different fungicide programs but yields were basically equal.

[6] More Farm in Pickens County; Sprayed with Headline 6 oz/A at R3 growth stage; Area harvested = 2.2 acres.

Determining Time of Infection and Incidence of Soybean Viruses in Commercial Fields, Results from Year One of Three

E. J. Sikora, J. F. Murphy, and D. P. Delaney

A three-year study was initiated in 2010 to determine virus incidence in selected soybean fields over time and relative to stages of plant growth. Typically, the earlier a plant is infected with a virus, the more severe the symptoms and resulting yield loss. Results from our soybean disease surveys indicated that bean pod mottle virus (BPMV) and soybean mosaic virus (SMV) were the most common viruses affecting soybean in Alabama.

Five commercial soybean fields located in Greene, Marengo, or Pickens counties were monitored for BPMV, SMV, and tomato spotted wilt virus (TSWV) during the 2010 growing season. These fields were chosen because of their close proximity to fields that were heavily infected with BPMV and SMV the previous year. Fields were sampled at full bloom, pod development, and crop maturity by randomly collecting 75 leaves at each growth stage and then analyzing the leaves for the presence of BPMV, SMV, and TSWV.

Results show that BPMV and SMV were present in the majority of fields sampled (see table 1); however, TSWV was not detected (data not shown). BPMV was detected more frequently than SMV and incidence sometimes reached high levels at early stages of soybean plant development (i.e. field 2). BPMV infection may occur prior to bloom which likely leads to greater yield losses. Beacuse BPMV is spread to and among soybeans by feeding bean leaf beetles, early season control of bean leaf beetles may reduce incidence of BPMV and associated losses in yield in soybean in Alabama.

Percent Infection of Soybeans with BPMV and/or SMV at Three Growth Stages[1]

Field [2]	——Bean Pod Mottle Virus——			——Soybean Mosaic Virus——		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
1	11.2	12.5	53.3	0.0	0.0	0.0
2	80.2	98.6	100	0.0	2.6	0.0
3	10.2	10.8	43.2	1.2	1.3	0.0
4	9.4	2.6	0.0	10.8	2.6	6.6
5	0.0	6.7	0.0	6.0	0.0	0.0

[1] Three growth stages: 1 = bloom; 2 = pod fill; and 3 = crop maturity.

[2] Fields 1 and 2 were located in Pickens County; field 3 was located in Greene County; and fields 4 and 5 were located in Marengo County.

TRIAZOLE FUNGICIDES AND TIMING FOR ASIAN SOYBEAN RUST CONTROL, FAIRHOPE, 2010

D. P. Delaney, E. J. Sikora, K. S. Lawrence, M. Pegues, J. Jones, and M. Delaney

This trial was conducted to determine the relative effectiveness of several triazole fungicides for control of Asian soybean rust (*Phakopsora pachyrhizi*) and other foliar diseases in soybean. At the Gulf Coast Research and Extension Center in Fairhope, Asgrow DP 7330 RR soybeans were planted on June 15 in 38-inch bedded rows. Plots were four rows wide and 25 feet long. The growing season was initially dry through mid-summer, which limited plant size and canopy and triggered early blooming. However, there were several showers during late summer to fill out the pods.

Triazole fungicides (Topguard, Domark, Folicur, Alto, and Proline) were applied as a foliar spray at either R3 (August 11) or R5 (R3 + 21 days, September 3) to evaluate preventive (R3) and curative (R5) effects and were compared to preventative (R3) treatments with strobiluron fungicides (Headline, Quadris, and Stratego). Fungicides were applied in 18 gallons per acre of water using a Lee Spider high clearance sprayer with Turbodrop TDXL 10002 flat fan nozzles on 19-inch centers at 60 psi.

Soybean foliar diseases were evaluated regularly by rating disease severity of Asian soybean rust and target spot in each plot after the R5 growth stage. Asian soybean rust leaf symptoms were initially observed in nearby sentinel plots in late May, but not in the trial before maturity.

Plots were harvested on November 11. Fungicide treatments did not statistically affect yield or 100-seed weights in 2010 likely due to late onset of Asian soyean rust.

SOYBEAN 100-SEED WEIGHTS AND YIELDS FOR TRIAZOLE TIMING FUNGICIDE TREATMENTS AT THE GULF COAST RESEARCH AND EXTENSION CENTER, 2010

Fungicide	Rate/A	Stage	100-seed wt.	Yield
			g	*bu/A*
Check	—	—	15.85	58.7
Topguard	7 fl oz	R3	15.98	62.1
Topguard	7 fl oz	R5	16.05	58.2
Domark	5 fl oz	R3	15.84	56.0
Domark	5 fl oz	R5	15.98	60.7
Folicur	4 fl oz	R3	16.31	52.8
Folicur	4 fl oz	R5	16.31	59.4
Alto	4 fl oz	R3	15.89	54.2
Alto	4 fl oz	R5	16.04	60.6
Proline	3 fl oz	R3	16.24	58.8
Proline	3 fl oz	R5	16.34	55.5
Headline	6 fl oz	R3	16.18	57.9
Quadris	6 fl oz	R3	15.98	60.9
Stratego	10 fl oz	R3	15.82	57.2
LSD (p=0.10)			***NS***	***NS***

Strobilurin Fungicide Greening Effects on Soybeans, Belle Mina, 2010

D. P. Delaney, E. J. Sikora, K. S. Lawrence, B.E. Norris, and D. Harkins

A study was conducted in 2010 to determine the effects of strobilurin fungicides on the retention of green leaves after pod maturity when strobilurin fungicides have been applied for control of Asian soybean rust and other foliar diseases. Retention of green leaves after pod maturity can lead to seed deterioration, shattering losses, and greatly reduced harvest speeds with increased costs and foreign material dockage. These problems have been linked to plant physiological changes and secondary disease control issues.

A trial at the Tennessee Valley Research and Extension Center (TVREC) in Belle Mina investigated the use of three strobilurin containing fungicides (Headline, Quadris, and Stratego), as well as a triazole fungicide (Domark) labeled as controlling several foliar diseases applied at two growth stages. Asgrow 5606 RR soybean seed was planted on May 5 using conventional tillage and managed according to Extension recommendations. Plots consisted of four rows, each 30 feet long and 30 inches wide, arranged in a randomized complete block design with four replications. Fungicides were applied in a factorial design at either the late R2 growth stage (full bloom) on July 9, or R2 + R5 (beginning seed fill) growth stage on July 30. Fungicides were applied in 20 gallons per acre of water using a backpack CO^2 sprayer equipped with Turbodrop TDXL 10002 flat fan nozzles on 19-inch centers at 60 psi. The center two rows of each plot were harvested with a plot combine on October 6. The samples were weighed, measured for moisture, and saved.

Due to relatively hot and dry weather until mid-summer, disease development was low except for aerial web blight. Aerial web blight was noted by early September, with all fungicide treatments decreasing web blight compared to the untreated check. Yields were 33 to 40 bushels per acre and were increased by most fungicide treatments compared to the check, except for Quadris applied at R3 only, which was not significantly different in yield. There were no significant effects of fungicide application for 100-seed weight. The trial was rated for greening at pod maturity (R7 stage) and there were no significant effects of fungicides on leaf or stem greening. A single well-timed fungicide application controlled aerial web blight and increased yields by 3 to 7 bushels per acre for most treatments compared to the check.

Seed Weights and Yields of Strobilurin Treated Soybeans with Different Application Timings, Tennessee Valley Research and Extension Center, 2010

Fungicide	Rate/A	Stage	Aerial web blight *%*	100-seed wt. *g*	Yield *bu/A*
Headline	6 fl oz	R2	14.3	12.84	40.4
Headline	6 fl oz	R2+R5	13.0	12.67	40.3
Quadris	6 fl oz	R2	16.3	12.68	33.2
Quadris	6 fl oz	R2+R5	18.8	12.54	36.7
Stratego	10 fl oz	R2	15.0	12.88	40.9
Stratego	10 fl oz	R2+R5	11.0	12.91	38.8
Domark	5 fl oz	R2	18.3	12.96	37.0
Domark	5 fl oz	R2+R5	15.8	12.67	38.5
Check	—	—	28.5	12.28	33.4
LSD(p=0.10)			***7.6***	***NS***	***4.6***

Strobilurin Fungicide Greening Effects on Soybeans, Shorter, 2010

D. P. Delaney, E. J. Sikora, K. S. Lawrence, and S. Scott

A study was conducted in 2010 to determine the effects of strobilurin fungicides on the retention of green leaves after pod maturity when strobilurin fungicides have been applied for control of Asian soybean rust and other foliar diseases. Retention of green leaves after pod maturity can lead to seed deterioration, shattering losses, and greatly reduced harvest speeds with increased costs and foreign material dockage. These problems have been linked to plant physiological changes and secondary disease control issues.

A trial at the E.V. Smith Research Center, Field Crops Unit in Shorter investigated the use of three strobilurin containing fungicides (Headline, Quadris, and Stratego), as well as a triazole fungicide (Domark) labeled as controlling several foliar diseases, applied at two growth stages. Pioneer 94Y70 (RR) soybean seed was planted May 6 in a Compass loamy sand into a killed rye cover crop using no-till with subsoiling and managed according to Extension recommendations. Plots consisted of four 36-inch rows, 25 feet long, arranged in a randomized complete block design with four replications. Fungicides were applied in a factorial design at either the R3 growth stage (3/16" pod) on June 21, or R3 + R5 (beginning seed fill) growth stage on July 13.

Fungicides were applied in 18 gallons per acre of water using a Lee Spider high clearance sprayer with Turbodrop TDXL 10002 flat fan nozzles on 19-inch centers at 60 psi. The center two rows of each plot were harvested with a plot combine on September 29. Samples were weighed, measured for moisture, and saved.

Although the plots were irrigated, extremely hot and dry weather in mid-summer limited disease development to trace levels of aerial web blight, Septoria brown spot, and target spot by late summer and were not severe enough to accurately rate. The trial was rated for greening at pod maturity (R7 and R8 stages) in early and mid-September. There were no significant effects of fungicide treatments on leaf or stem greening, although the entire test remained green enough to require a desiccant treatment at R8 on September 8.

There were no significant differences of individual or factorial treatments for 100-seed weights or yield (see table).

Seed Weights and Yields of Strobilurin Treated Soybeans with Different Application Timings, E.V. Smith Research Center, Field Crops Unit, 2010

Fungicide	Rate/A	Stage	100-seed wt.	Yield
			g	*bu/A*
Headline	6 fl oz	R3	15.14	29.9
Headline	6 fl oz	R3+R5	15.12	31.0
Quadris	6 fl oz	R3	15.26	32.3
Quadris	6 fl oz	R3+R5	15.70	30.8
Stratego	10 fl oz	R3	14.92	32.7
Stratego	10 fl oz	R3+R5	15.14	32.7
Domark	5 fl oz	R3	14.69	31.1
Domark	5 fl oz	R3+R5	15.45	31.1
Check	—	—	15.08	32.6
LSD(p=0.10)			***NS***	***NS***

Soybean Virus–Nematode Interaction Study

J. F. Murphy, K. S. Lawrence, and E. J. Sikora

Bean pod mottle virus (BPMV), soybean mosaic virus (SMV), and reniform nematodes individually cause severe diseases; their combined effect may lead to a synergistic disease that is extremely more severe than the additive effect of each disease. We studied the combined effects of BPMV, SMV, and reniform nematode on soybean plant growth and development. This project is an important first step to study effects of multiple pathogens on soybean crop production in Alabama.

Two soybean varieties that offered differing responses to the pathogens in this study were tested: 'Hutcheson,' which is susceptible to reniform nematode and 'Hartwig,' which is resistant. The response of each variety to either BPMV or SMV was not known.

The first two experiments revealed full susceptibility (i.e., systemic symptoms and virus invasion of young developing tissues) of Hartwig to both BPMV and SMV. In contrast, Hutcheson was not infected by SMV but was susceptible to BPMV.

These results raised several important questions: Will infection of Hutcheson by BPMV alter that variety's resistance to SMV? Will infection of Hartwig by BPMV and/or SMV alter Hartwig's resistance to reniform nematode? Will the combined infections of one or both viruses with reniform nematode lead to synergistic disease?

The combined inoculation of both viruses did not lead to infection of Hutcheson plants by SMV and, therefore, despite infection by BPMV, Hutcheson plants remained resistant to SMV. The combined infection of BPMV and SMV in Hartwig resulted in a more severe disease than either virus alone, although it did not appear severe enough to consider synergistic.

Nematode data were limited for the greenhouse experiments. We performed several large experiments that included all combinations of pathogens (both viruses and reniform nematode) but each time there was limited growth in nematode populations. We overcame this problem by conducting experiments in microplots that consisted of 4400 cc pots placed within larger pots buried in several feet of mulch, located outside the greenhouse complex.

In the microplots, Hutcheson plants subjected to each treatment (i.e., each pathogen alone and in all combinations) did not differ in shoot dry weight or 100 seed weight. Total seed weight (i.e., total yield) was significantly less for plants inoculated with BPMV + SMV with no other differences among treatments. Interestingly, reniform numbers were significantly less for plants inoculated with each virus (alone or as BPMV+SMV) compared with reniform alone, keeping in mind that SMV did not infect these plants.

For Hartwig plants, shoot dry weight did not differ among treatments with the exception of BPMV+SMV+reniform which significantly reduced shoot dry weight. No differences occurred among treatments for 100 seed weight. With one exception, any treatment that included BPMV significantly reduced total seed weight. Significantly more reniform nematodes were isolated from pots containing plants inoculated with SMV alone (relative to reniform alone), whereas significantly fewer nematodes occurred in BPMV+SMV+reniform treatment compared with the other virus-nematode treatments.

In summary, microplots offer an exceptional setting to test these mixed pathogen regimes allowing controlled conditions in a semi-natural setting. BPMV appears to pose a greater threat to soybean yields than SMV and reniform. BPMV and BPMV+SMV had the greatest negative effect on yield, although all three pathogens together also had significant negative effects. Why co-infection of reniform with either BPMV or SMV reduced reniform numbers in Hutcheson but increased reniform numbers in Hartwig (compared with reniform alone) remains an intriguing question and illustrates the occurrence of an interaction among pathogens.

NEMATODE MANAGEMENT

Evaluation of Experimental Nematicides for the Control of Reniform Nematode on Soybean in North Alabama, 2010

S. R. Moore, K. S. Lawrence, and B. E. Norris

Selected experimental seed treatments were evaluated to determine their efficacy against the reniform nematode (*Rotylenchulus reniformis*) on cotton in north Alabama. The soil was a Decatur silt loam ((23 percent sand, 49 percent silt, 28 percent clay) that had a history of reniform nematode infestation. Soil temperature was 64 degree F at a 4-inch depth on the day of planting with adequate soil moisture. All seed treatments were applied to the seed by the manufacturer. Orthene 90S (2 ounces per acre) was applied to all plots as needed for thrips control. Temik 15G was applied as a granular in-furrow treatment and Vydate L 2SL was applied as a foliar spray. Each plot consisted of two rows, 25 feet long with 40-inch row spacing, and plots were arranged in a randomized complete block design with five replications. Adjacent blocks were separated by 15-foot alleys. Standard herbicides, insecticides, and fertility production practices, as recommended by the Alabama Cooperative Extension System, were used throughout the season. Population densities of the reniform nematode were determined at 26 and 61 days after planting (DAP). Ten soil cores, 0.5 inch in diameter and 6 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Ratings to determine plant vigor were recorded at 26 DAP. Plots were mechanically harvested on September 13. Data were statistically analyzed by analysis of variance using the generalized linear models (GLM) procedure, and means compared using Fisher's protected least significant difference (LSD) test.

Plant vigor was significantly increased by Treatment 9 (A18059 + Avicta 4.17FS + A14379 + Vydate L 2SL) compared to Treatments 1 (Apron Maxx RFC + A18059), 2 (A14379 + A18059), 3 (Avicta 4.17FS + Treatment 2), and 5 (A9625 + Cruiser 5FS + Avicta 4.17FS + A18059). Treatment 8 (Treatment 1 + Temik 15G) significantly increased vigor compared to Treatment 5. All treatments resulted in similar reniform nematode populations at 26 DAP; however, Treatment 7 (Trilex AL Flowable + Allegiance-FL + Gaucho Grande 5FS + STP17217) resulted in significantly lower nematode populations compared to Treatments 3 and 4 at 61 DAP. Seed cotton yields averaged 2054 pounds per acre in 2010. Treatment 4 produced the highest seed cotton yields, and was significantly higher than Treatment 6 (STP15273 + STP15154 + STP27320 + STP17141).

Soybean Seed Treatments for Root-Knot Nematode Management in North Alabama, 2009

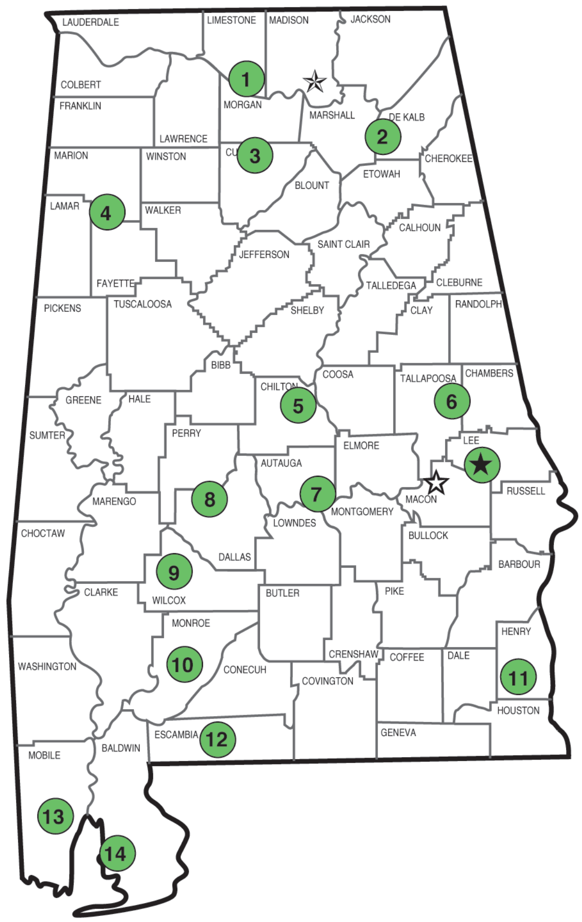
	Treatment	Rate oz/100 lb seed	Application DAP	Vigor	—*R. reniformis*/ 150 cm^3 soil— 26 DAP	61 DAP	Yield *lb/A*
1	Apron Maxx RFC	0.1000	0	3.0 bc	108.2 a	200.9 ab	2050.7 ab
	A18059	0.0160					
2	A14379	0.9000	0	3.0 bc	77.3 a	231.8 ab	2092.3 ab
	A18059	0.0160	0				
3	Avicta 4.17FS	0.0019	0	3.0 bc	108.2 a	309.0 a	2043.8 ab
	Treatment 2						
4	Avicta 4.17FS	0.0024	0	3.2 abc	123.6 a	324.5 a	2136.5 a
	Treatment 2		0				
5	A9625	0.0800	0	2.8 c	77.3 a	185.4 ab	2024.0 ab
	Cruiser 5FS	0.8000	0				
	Avicta 4.17FS	0.0024	0				
	A18059	0.0160	0				
6	STP15273	0.2500	0	3.2 abc	123.6 a	200.9 ab	1987.7 b
	STP15154	0.1600	0				
	STP27320	0.0550	0				
	STP17141	0.3356	0				
7	Trilex AL Flowable	0.0800	0	3.2 abc	123.6 a	123.6 b	2068.6 ab
	Allegiance-FL	0.0640	0				
	Gaucho Grande 5FS	1.0000	0				
	STP17217	0.1 mg/seed	0				
8	Treatment 1						
	Temik 15G	5 lb/A	0	3.4 ab	123.6 a	216.3 ab	2016.4 ab
9	A18059	0.0160	0	3.6 a	108.2 a	185.4 ab	2067.1 ab
	Avicta 4.17FS	0.0024	0				
	A14379	0.9000	0				
	Vydate L 2SL	24.5 oz/A	61				
LSD (P ≤ 0.10)				***0.49***	***62.09***	***172.59***	***146.6***

[1] Plant vigor was rated on a 1 to 5 scale with 3 being the control. 4 and 5 are progressively better than the control and 1 and 2 are similarly worse than the control.

Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤ 0. 10).

Contributors Index

Alabama's Agricultural Experiment Station
AUBURN UNIVERSITY



With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the state has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.

Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.
✯ Alabama A&M University.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Research and Extension Center, Belle Mina.
2. Sand Mountain Research and Extension Center, Crossville.
3. North Alabama Horticulture Research Center, Cullman.
4. Upper Coastal Plain Agricultural Research Center, Winfield.
5. Chilton Research and Extension Center, Clanton.
6. Piedmont Substation, Camp Hill.
7. Prattville Agricultural Research Unit, Prattville.
8. Black Belt Research and Extension Center, Marion Junction.
9. Lower Coastal Plain Substation, Camden.
10. Monroeville Agricultural Research Unit, Monroeville.
11. Wiregrass Research and Extension Center, Headland.
12. Brewton Agricultural Research Unit, Brewton.
13. Ornamental Horticulture Research Center, Spring Hill.
14. Gulf Coast Research and Extension Center, Fairhope.