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GRAIN CROPS: CROP MANAGMENT

Using Subsurface Drip Irrigation and Fertility Management Strategies to Maximize Corn Production in Alabama

J. P. Fulton, C. W. Wood, M. P. Dougherty, B. Ortiz, C. H. Burmester, S. H. Norwood, A. Winstead, M. H. Hall, and D. Mullenix

This study was initiated in 2009 at the Tennessee Valley Research and Extension Center (TVREC), Belle Mina, Alabama, in an attempt to maximize corn production utilizing subsurface drip irrigation (SDI) in conjunction with fertigation. SDI was installed at a nominal depth of 15 inches on 30-inch spacing. Corn was planted so that each row was directly over the SDI tape using RTK autoguidance. Six treatments were planted and replicated four times. The four irrigation treatments included 0 percent, 50 percent, 75 percent, and 100 percent of pan evaporation adjusted for canopy cover with the rainfed treatment serving as the control. These four treatments received 25 percent pre-plant N and the other 75 percent at sidedress (around V6). Two treatments (one at 50 percent and the other 100 percent pan evaporation) received N through fertigation irrigation. Nitrogen applications to these two fertigated treatments were 25 percent pre-plant, 25 percent sidedressed at V6, 25 percent fertigated between V10 and V12, and 25 percent fertigated between V18 and VT. Whole plant (V6 and V12), ear-leaf (V18), and grain N content at harvest were measured. A yield monitor and accumulated mass measured in a weigh wagon were used to determined yield on a per plot basis.

Significant differences were observed in yield (see table) between treatments with the 100 percent pan evaporation-fertigation treatment producing the highest yield. The rainfed or control treatment exhibited a much lower yield compared to irrigated treatments; this lower yield was attributed to high heat and no rainfall during pollination (June 17 through July 4). Although the total seasonal rainfall for 2009 (12.4 inches from June through August) was above the normal average (11.3 inches) for TVREC, irrigation had an impact on corn yield mostly likely due to the mid-season dry period, which occurred during pollination. Chlorophyll levels increased, as expected, between V6 and V18 with significant differences occurring at V18. These readings correlated with yield; the fertigated treatment at 100 percent pan evaporation (adjusted for canopy cover) showed the highest chlorophyll levels and the rainfed treatment resulted in the lowest chlorophyll values. No significant differences were observed for carbon among any treatment for each consecutive sampling throughout the growing season. In summary, SDI provided a benefit in 2009 with no advantage observed for N fertigation. This study will be repeated in the future.

Yield, Chlorophyll, and Nitrogen Averages per Treatment, 2009

—Irrigation—		Yield	——Chlorophyll——			———Nitrogen———		
Trt.	*in*	*bu/A*	V6	V12	V18	V6	V12[1]	V18
0	0	89.8 c	34.9 a	48.0 a	47.1 c	2.68 a	3.16 ab	2.65 a
50	8.4	218.2 b	34.8 a	47.8 a	53.1 b	2.73 a	3.21 a	2.68 a
50F[2]	8.4	212.4 b	35.9 a	46.8 a	54.1 ab	2.97 a	2.83 bc	2.78 a
75	12.6	232.3 ab	34.7a	48.3 a	55.2 ab	2.80 a	3.09 ab	2.78 a
100	16.9	234.4 ab	36.4 a	47.5 a	55.6 ab	2.70 a	2.95 abc	2.85 a
100F[2]	16.9	243.2 a	35.7 a	47.1 a	56.0 a	2.58 a	2.64 c	2.81 a

[1] Nitrogen average differences per treatment at v12 may be due to mold during drying.

[2] F = fertigation.

Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

Efficacy of Dupont Experimental Seed Treatments on Root-Knot Nematodes and Yield of Corn in Central Alabama, 2009

K. S. Lawrence, S. R. Moore, G. W. Lawrence, and S. Nightengale

Experimental seed treatment nematicides coded 115078-15 1 through 6 were evaluated for the management of the root-knot nematode on corn. The test plot was located at the Plant Breeding Unit of the E. V. Smith Research and Extension Center, near Shorter, Alabama. The field has a long history of root-knot nematode infestation, and the soil type is classified as a Kalmia loamy sand (80 percent sand, 10 percent silt, and 10 percent clay). Plots consisted of two rows, 25 feet long with a 36-inch row spacing, and were planted in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. Counter 15 G (8 pounds per acre) was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. All other compounds tested were seed treatments applied by the manufacturer. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematodes were determined at four weeks after planting (WAP) on May 19. Five root systems were collected from each plot and nematode eggs were removed using sodium hypochlorite extraction and sucrose centrifugation. Soil samples were also collected for nematode analysis at seven WAP. Plots were harvested on September 15. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.10$).

Root-knot nematode pressure was low to moderate in the 2009 season. Monthly average maximum temperatures from June to October were 90.1, 86.7, 87.1, 81.2, and 70.1 degrees F; average minimum temperatures were 66.7, 66.4, 66.9, 64.6 and 50.2 degrees F. Total rainfall amounts from June to October were 1.1, 5.5, 4.18, 4.63, and 6.53 inches. The total rainfall for the growing season was 21.94 inches. At planting, root-knot nematode numbers averaged 77 second stage juveniles per 150 cm^3 of soil over the entire field. Numbers of root-knot second stage juveniles in extracted from the roots systems at four WAP and from the soil at seven WPA were similar across all treatments. Corn plant height, stand, and root fresh weights were not influenced by any treatment (data not shown). Corn yields ranged from a low of 94.9 to a high of 121.12 bushels per acre with four of the experimentals—115078-15-1, 115078-15-3, 115078-15-5, and 115078-15-6—increasing yields ($P \leq 0.10$) over 115078-15-2 and 115078-15-4. The increase in yield by 115078-15-5 over the lowest yielding experimental 115078-15-2 was 26.2 bushels per acre, which would be valued at approximately $130 per acre at $5 per bushel

Efficacy of Dupont Experimental Seed Treatments on Root-Knot Nematodes and Yield in Corn in Central Alabama, 2009

		—*Meloidogyne incognita*/—		Corn seed
		10 g roots[1]	150 cm^3 soil	*bu/A*
No.	Treatment	May 20	June 9	Sept 15
1	115078-15-1	479.0 a	123.6 a	100.8 a
2	115078-15-2	309.0 a	370.8 a	94.9 b
3	115078-15-3	540.8 a	123.6 a	103.0 a
4	115078-15-4	339.9 a	262.7 a	96.5 b
5	115078-15-5	185.4 a	278.1 a	121.1 a
6	115078-15-6	432.6 a	139.1 a	107.3 a
	LSD ($P \leq 0.10$)	***303.21***	***263.79***	***22.17***

[1]Ten grams of fresh root weight were subsampled from the root systems and extracted for nematodes.

Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

Efficacy of Syngenta Experimental Seed Treatments on Root-Knot Nematodes and Yield of Corn in Central Alabama, 2009

K. S. Lawrence, S. R. Moore, G. W. Lawrence, and S. Nightengale

Experimental seed treatment nematicides were evaluated for the management of the root-knot nematode on corn. The test plot was located at the Plant Breeding Unit of the E. V. Smith Research and Extension Center, near Shorter, Alabama. The field had a long history of root-knot nematode infestation, and the soil type was classified as a Kalmia loamy sand (80 percent sand, 10 percent silt, and 10 percent clay). Plots consisted of two rows, 25 feet long with a 36-inch row spacing, and were planted in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. Counter 15 G (8 pounds per acre) was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. All other compounds tested were seed treatments applied by the manufacturer. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematodes were determined at four weeks after planting on May 19. Five root systems were collected from each plot and nematode eggs were removed using sodium hypochlorite extraction and sucrose centrifugation. Plots were harvested on September 15. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.10$).

Root-knot nematode pressure was low to moderate in the 2009 season. Monthly average maximum temperatures from June to October were 90.1, 86.7, 87.1, 81.2, and 70.1 degrees F; average minimum temperatures were 66.7, 66.4, 66.9, 64.6 and 50.2 degrees F. Total rainfall amounts from June to October were 1.1, 5.5, 4.18, 4.63, and 6.53 inches. The total rainfall for the growing season was 21.94 inches. At planting, root-knot nematode numbers averaged 159 second stage juveniles per 150 cm^3 of soil over the entire field. Numbers of root-knot eggs per 10 g of root were similar across all treatments during this cool wet spring on May 19 and re-sampling in June found higher numbers in all treatments and the control. Corn plant height, stand, and root fresh weights were not influenced by any treatment (data not shown). Corn yields ranged from a low of 111.8 to a high of 125.7 bushels per acre with all treatments being similar to the Apron XL, Maxim XL, Dynasty FS control. The difference between the highest and lowest yielding treatments was 13.92 bushels per acre. Rainfall in June was limited to during tasseling which most probably limited the yield potential of the corn.

Efficacy of Dupont Experimental Seed Treatments on Root-Knot Nematodes and Yield in Corn in Central Alabama, 2009

No.	Treatment[3]	Rate	*Meloidogyne incognita*/ 10 g roots[1] May 19	June 9	Yield *bu/A* Sept 15
1	Apron XL 3 LS	1.0 g ai/100 kg	170.0 a	262.7 a	111.8 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
2	Apron XL 3 LS	1.0 g ai/100 kg	92.7 a	139.1 a	114.3 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	Cruiser 500 FS	0.25mg ai/seed			
3	Apron XL 3 LS	1.0 g ai/100 kg	92.7 a	788.0 a	114.2 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	Cruiser 500 FS	0.5mg ai/seed			
4	Apron XL 3 LS	1.0 g ai/100 kg	92.7 a	170.0 a	125.7 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	STP15201	0.5 mg ai/seed			
5	Apron XL 3 LS	1.0 g ai/100 kg	92.7 a	139.1 a	123.2 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	Cruiser 500 FS	0.5mg ai/seed			
	A16115	0.65 mg ai/seed			
6	Apron XL 3 LS	1.0 g ai/100 kg	77.3 a	957.9 a	111.8 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	A16115	0.85 mg ai/seed			
7	Apron XL 3 LS	1.0 g ai/100 kg	92.7 a	448.1 a	125.3 a
	Maxim XL 2.7 FS	3.5 g ai/100 kg			
	Dynasty 100 FS	1.0 g ai/100 kg			
	Counter 20 CR	11.2 g ai/100 row-m			
LSD (P< 0.10)			***48.9***	***974.91***	***19.5***

[1]Ten grams of fresh root weight were subsampled from the root systems and extracted for nematodes.
Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

EFFICACY OF DUPONT EXPERIMENTAL SEED TREATMENTS ON ROOT-KNOT NEMATODES AND YIELD OF CORN IN SOUTH ALABAMA, 2009

K. S. Lawrence, S. R. Moore, G. W. Lawrence, and J. R. Akridge

Experimental seed treatment nematicides were evaluated for the management of the root-knot nematode on corn. The test plot was located at the Brewton Experimental Field near Brewton, Alabama. The field had a long history of root-knot nematode infestation, and the soil type was classified as a Benndale fine sandy loam (73 percent sand, 20 percent silt, 7 percent clay). Plots consisted of four rows, 25 feet long with a 36-inch row spacing, and were planted in a randomized complete block design with four replications. Blocks were separated by 20-foot alleys. Counter 15 G (8 pounds per acre) was applied at planting on April 21 in the seed furrow with chemical granular applicators attached to the planter. All other compounds tested were seed treatments applied by the manufacturer to the corn variety Pioneer 33N58. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematodes were determined at 4 weeks after planting on May 20. Five root systems were collected from each plot and nematode eggs were removed using sodium hypochlorite extraction and sucrose centrifugation. Plots were harvested on September 15. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.10$).

Root-knot nematode pressure was low to moderate in the 2009 season. Monthly average maximum temperatures for April through September were 77.8, 84.7, 94.3, 92.9, 90.3, and 88 degrees F with average minimum temperatures of 52.9, 66.0, 71.1, 71.1, 70.9, and 70.2 degrees F respectively. Rainfall accumulation for each month was 5.4, 6.8, 3.0, 5.3, 6.5, and 4.3 inches with a total of 31.3 inches. At planting, root-knot nematode numbers averaged 77 second stage juveniles per 150 cm^3 of soil over the entire field. Numbers of root-knot second stage juveniles in the soil were similar across all treatments. The number of eggs per g of root reduced ($P \leq 0.10$) by the 115078-15-4 seed treatment as compared to the 115078-15-6 seed treatment. Corn plant height, stand, and root fresh weights were not influenced by any treatment (data not shown). Corn yields were not significantly different between any treatment; however, there was a difference of 5.6 bushels per acre between the low and high yielding treatments. Rainfall in June was limited during tasseling, which probably limited the yield potential of the corn.

EFFICACY OF DUPONT EXPERIMENTAL SEED TREATMENTS ON ROOT-KNOT NEMATODES AND YIELD IN CORN IN SOUTH ALABAMA, 2009

		—*Meloidogyne incognita*/—		Corn seed
		150 cm^3 soil	10 g roots[1]	*bu/A*
No.	Treatment	May 20	May 20	Sept 15
1	115078-15-1	0.0	200.9 ab	105.2 a
2	115078-15-2	30.9	123.6 ab	100.0 a
3	115078-15-3	15.5	77.3 ab	105.4 a
4	115078-15-4	15.5	46.4 a	104.4 a
5	115078-15-5	15.5	108.2 ab	105.6 a
6	115078-15-6	15.5	231.8 b	102.7 a
	LSD (P≤ 0.10)	***35.7***	***170.3***	***19.8***

[1]Ten grams of fresh root weight were subsampled from the root systems and extracted for nematodes.
Means followed by same letter do not significantly differ by Fisher's LSD (P≤ 0.10).

Efficacy of Telone II on Root-Knot Nematodes and Yield in Corn in South Alabama, 2009

K. S. Lawrence, S. R. Moore, G. W. Lawrence, and J. R. Akridge

Telone II nematicide was evaluated for the management of the root-knot nematode on corn. The test plot was located at the Brewton Experimental Field near Brewton, Alabama. The field had a long history of root-knot nematode infestation, and the soil type was classified as a Benndale fine sandy loam (73 percent sand, 20 percent silt, 7 percent clay). Plots consisted of four rows, 25 feet long with 36-inch row spacing and were planted in a randomized complete block design with four replications. Blocks were separated by 10-foot wide alleys. Telone II was applied as a pre-plant application of 3 gallons per acre with a modified ripper hipper. A CO_2-charged system was used to propel the fumigant through flow regulators mounted on delivery tubes attached to the back edge of forward-swept chisels. Telone II was injected 12 inches deep 21 days prior to planting with one chisel per row. Rows were immediately hipped with disc hillers to seal and prevent the rapid loss of the fumigant. All remaining rows were chiseled at the same depth and hipped without the fumigant. Counter 15 G (8 pounds per acre) was applied at planting on April 21 in the seed furrow with chemical granular applicators attached to the planter. Starter and layby fertilizers were applied as standard soil injection procedures. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematodes were determined at 4 weeks after planting on May 10. Five root systems were collected from each plot and nematode eggs were removed using sodium hypochlorite extraction and sucrose centrifugation. Plots were harvested on September 15. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.10$).

Root-knot nematode pressure was low to moderate in the 2009 season. Monthly average maximum temperatures for April through September were 77.8, 84.7, 94.3, 92.9, 90.3, and 88 degrees F with average minimum temperatures of 52.9, 66.0, 71.1, 71.1, 70.9, and 70.2 degrees F respectively. Rainfall accumulation for each month was 5.4, 6.8, 3.0, 5.3, 6.5, and 4.3 inches with a total of 31.3 inches. At Telone II injection, root-knot nematode numbers averaged 25 second stage juveniles per 150 cm^3 of soil over the entire field. Numbers of root-knot second stage juveniles in the soil were similar across all treatments on May 20. The number of eggs per gram of root was reduced ($P \leq 0.10$) by all three Telone II treatments as compared to Counter 15G and Poncho treatments. Corn yields were very similar between all treatments averaging 184.1 bushels per acre across all treatments. Rainfall in June was limited during tasseling with record high temperatures, which probably limited the yield potential of the corn.

Efficacy of Telone II on Root-Knot Nematodes and Yield in Corn in South Alabama, 2009

		—*Meloidogyne incognita*/—		Corn seed
		150 cm^3 soil	10 g roots[1]	*bu/A*
No.	Treatment	May 20	May 20	Sept 15
1	Telone II 3 gal/A full starter and layby fertilizer	0.0 b	51.5 b	185.8 a
2	Telone II 3 gal/A 20% reduction in starter fertilizer	25.8 ab	51.5 b	182.2 a
3	Telone II 3 gal/A 20% reduction in layby fertilizer	0.0 b	25.8 b	184.9 a
4	Counter 15G full starter and layby fertilizer	13.5 ab	450.6 a	185.2 a
5	Poncho full starter and layby fertilizer	38.6 a	579.4 a	182.3 a
	LSD ($P \leq 0.10$)	***31.01***	***398.71***	***21.11***

[1]Ten grams of fresh root weight were subsampled from the root systems and extracted for nematodes.
Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

Efficacy of Syngenta Seed Treatments on Root-Knot Nematodes and Yield in Corn in South Alabama, 2009

K. S. Lawrence, S. R. Moore, G. W. Lawrence, and J. R. Akridge

Experimental seed treatment nematicides STP15201 and A16115 were evaluated in combination with seed treatment fungicides Apron XL, Maxim XL, and Dynasty and the insecticides Cruiser and Counter in various combinations for the management of the root-knot nematode on corn. The test plot was located at the Brewton Experimental Field near Brewton, Alabama. The field had a long history of root-knot nematode infestation, and the soil type was classified as a Benndale fine sandy loam (73 percent sand, 20 percent silt, 7 percent clay). Plots consisted of four rows, 25 feet long with a 36-inch row spacing, and were planted in a randomized complete block design with four replications. Blocks were separated by 20-foot alleys. Counter 15 G (8 pounds per acre) was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. All other compounds tested were seed treatments applied by the manufacturer. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematodes were determined at four weeks after planting on May 20. Five root systems were collected from each plot and nematode eggs were removed using sodium hypochlorite extraction and sucrose centrifugation. Plots were harvested on September 15. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P < 0.10$).

Root-knot nematode pressure was low to moderate in the 2009 season. Monthly average maximum temperatures for April through September were 77.8, 84.7, 94.3, 92.9, 90.3, and 88 degrees F with average minimum temperatures of 52.9, 66.0, 71.1, 71.1, 70.9, and 70.2 degrees F respectively. Rainfall accumulation for each month was 5.4, 6.8, 3.0, 5.3, 6.5, and 4.3 inches with a total of 31.3 inches. At planting, root-knot nematode numbers averaged 107 second stage juveniles per 150 cm^3 of soil over the entire field. Numbers of root-knot eggs per g of root were similar across all treatments. Corn plant height, stand, and root fresh weights were not influenced by any treatment (data not shown). Corn yields ranged from a low of 77 to a high of 96 bushels per acre with all treatments being similar to the Apron XL, Maxim XL, Dynasty FS control (Treatment 1). The difference between the highest and lowest yielding treatments was 18.2 bushels per acre. Rainfall in June was limited to 77.2 mm during tasseling, which most probably limited the yield potential of the corn.

Efficacy of Experimental Seed Treatments on Root-Knot Nematode on Corn in Central Alabama, 2008

No.	Treatment [2]	Rate	*Meloidogyne incognita*/ 10 g roots[1] May 20	Yield *bu/A* Sept 15
1	Control		61.8 a	83.8 a
2	Cruiser 500 FS	0.25mg ai/seed	46.4 a	87.3 a
3	Cruiser 500 FS	0.5mg ai/seed	15.5 a	82.1 a
4	STP15201	0.5 mg ai/seed	61.8 a	77.8 a
5	Cruiser 500 FS A16115	0.5mg ai/seed 0.65 mg ai/seed	30.9 a	89.9 a
6	A16115	0.85 mg ai/seed	46.4 a	82.0 a
7	Counter 20 CR	11.2 g ai/100 row-m	30.9 a	96.0 a
	LSD (P≤ 0.10)		***48.9***	***21.2***

[1]Ten grams of fresh root weight were subsampled from the root systems and extracted for nematodes.

[2] All treatments included Apron XL (1.0 g ai/100 k), Maxim XL (3.5 g ai/100 kg), and Dynasty FS (1.0 g ai/100 kg)--the same treatments included in Treatment 1 (control).

Means followed by same letter do not significantly differ by Fisher's LSD (P≤ 0.10).

PEANUTS

The Effect of Vault® and Experimental BUPC-1 on Peanut Health in South Alabama, 2009

D. M. Herring, J. R. Jones, and K. S. Lawrence

Biological plant growth promoters were tested to determine its ability to promote plant health and vigor resulting in improved yields in peanut. The test was performed at the Gulf Coast Research and Extension Center in Fairhope, Alabama. Four-row plots were arranged in a randomized complete block design with three treatments and three replications. All biological and chemicals were applied as an in-furrow spray application using flat fan #8002 nozzles placed perpendicular to the row at 30 psi and applied in 10 gpa. Treatments were applied at planting on May 27. Treatments were as follows: Treatment 1 control; Treatment 2, Vault® applied at 5.0 ml per 30 row feet; and Treatment 3, BUPC-1 applied at 1 fluid ounce per 100 row feet. Plant vigor ratings were given on June 16. Vigor was visually rated on a 1 to 5 visual scale with 1 representing a poor vigor and 5 representing highest vigor. All plots were maintained throughout the season with standard production practices, which included seven fungicide sprays rotating Headline, Bravo, and Provost, applied from July 6 through September 28 as prescribed by the Alabama Cooperative Extension System. Plots were harvested on November 4, 161 days after planting. Data were statistically analyzed with the general linear models (GLM) procedure, and means were compared using Fisher's protected least significant difference (LSD) test.

Average monthly maximum temperatures from May to November were 82.7, 90.7, 90.0, 88.2, 87.0, 78.9, and 72.8 degrees F. Average monthly minimum temperatures from May to November were 70.3, 76.1, 73.9, 72.1, 61.6, and 58.1 degrees F. Rainfall totals from May to November were 0, 3.38, 5.93, 5.18, 6.32, 7.23, and 2.5 inches. Total rain for the growing season of 161 days was 28.05 inches. Plant vigor ratings on June 16 showed a statistical difference between BUPC-1 and the control. Treatments had an average vigor rating of 3.29 for all plots. BUPC-1 received a 3.63, the highest rating among the treatments. Yield data followed the same trend with all treatments producing yields statistically similar. BUPC-1 also had the highest yield producing 2.3 tons per acre, which was statistically different from the control. With peanuts averaging $330 per ton, a yield of 2.3 tons per acre would have an economic value of $760 per acre or $100 greater than the check.

The Effect of Vault and BUPC-1 on Peanut Health in South Alabama, 2009

No.	Treatment	Rate	Vigor[1] June 16	Seed yield *ton/A* Nov 4
1	Control		3.0 b	2.0 ab
2	Vault	5.0 ml/30 row ft.	3.3 ab	1.8 b
3	BUPC-1	1.0 fl oz/100 row ft.	3.6 a	2.3 a
	LSD ($P \leq 0.10$)		***0.52***	***0.37***

[1] Vigor ratings based on 1-5 scale, one being least vigorous and 5 being the most vigorous.

Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

Yield and Vigor Promotion of Peanuts Related to Becker Underwood®Experimentals, 2009

D. M. Herring, J. R. Jones, and K. S. Lawrence

Biological plant growth promoters were tested to determine its ability to promote plant health and vigor resulting in improved yields in peanut. The test was performed at the Gulf Coast Research and Extension Center in Fairhope, Alabama. Four-row plots were arranged in a randomized complete block design with ten treatments and six replications. All treatments (excluding BUPNJ-9 and Control) were mixed thoroughly with 3.6 fluid ounces of Vault® per 124 fluid ounces of chlorine-free water. All biologicals were applied as an in-furrow spray application using flat fan #8002 nozzles placed perpendicular to the row at 30 psi and applied in 10 gpa. Plant vigor ratings were taken on June 16. Vigor was visually rated on a 1 to 5 visual scale with 1 representing a poor vigor and 5 representing highest vigor. On July 8, each plot was evaluated for percentage of crop stand loss and vigor ratings were again noted following the same visual rating scale. All plots were maintained throughout the season with standard production practices, which included seven fungicide sprays rotating Headline, Bravo, and Provost, were applied from July 6 through September 28 as prescribed by the Alabama Cooperative Extension System. Plots were harvested on November 4, 161 days after planting. Data were statistically analyzed with the general linear models (GLM) procedure, and means were compared using Fisher's protected least significant difference (LSD) test.

Average monthly maximum temperatures from May to November were 82.7, 90.7, 90.0, 88.2, 87.0, 78.9, and 72.8 degrees F. Average monthly minimum temperatures from May to November were 70.3, 76.1, 73.9, 72.1, 61.6, and 58.1 degrees F. Rainfall totals from May to November were 0, 3.38, 5.93, 5.18, 6.32, 7.23, and 2.5 inches. Total rain for the growing season of 161 days was 28.05 inches. Vigor ratings on June 16 varied among the treatments with BUPNJ-4 having the highest vigor rating. By July 8 less variation was observed between the biological treatments but all were visibly larger than the control. All treatments received a visual vigor rating of 4; therefore, no significant differences in vigor ratings occurred among the treatments on June 16. However, all treatments showed statistically higher vigor ratings as compared to the control. Percentage of crop loss was also evaluated on this date. No treatments had losses except the untreated control which had plot losses of 21.3 percent. This may be due to the intense heat and drought experienced for three weeks immediately after planting. The stand loss was significant and only observed in the untreated control plots. Yield data varied among the treatments with BUPNJ-9 averaging the highest yield of 2.5 tons per acre. Biologicals BUPNJ-3, BUPNJ-4, BUPNJ-6, BUPNJ-7, and BUPNJ-8 all produced yields statistically comparable to BUPNJ-9. The average in yield of these biologicals was 2.27 tons per acre, which with peanuts averaging $330 per ton would have an economic value of $750 per acre or an increase of $288 compared with the check.

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No.	Treatment[1]	Rate of appliation	——Vigor rating[2]—— June 16	July 8	Stand loss % July 8	Seed yield *lb/A* Nov 4
1	BUPNJ-1	3.5 ml	3.5 d	4.0 a	0	2.0 ab
2	BUPNJ-2	3.5 ml	3.6 cd	4.0 a	0	1.9 ab
3	BUPNJ-3	3.5 ml	4.0 abc	4.0 a	0	2.2 a
4	BUPNJ-4	3.5 ml	4.3 ab	4.0 a	0	2.1 a
5	BUPNJ-5	3.5 ml	4.4 a	4.0 a	0	2.0 ab
6	BUPNJ-6	3.5 ml	4.1 ab	4.0 a	0	2.2 a
7	BUPNJ-7	3.5 ml	3.5 d	4.0 a	0	2.4 a
8	BUPNJ-8	3.5 ml	3.6 cd	4.0 a	0	2.2 a
9	BUPNJ-9	5.0 ml	3.9 bcd	4.0 a	0	2.5 a
10	Control		2.25 e	3.0 b	23.1	1.4 b
	LSD ($P \leq 0.10$)		***0.516***	***0***	***6.85***	***0.46***

[1] All treatments, excluding BUPNJ-9and Control, were mixed with 3.6 fluid ounces Vault

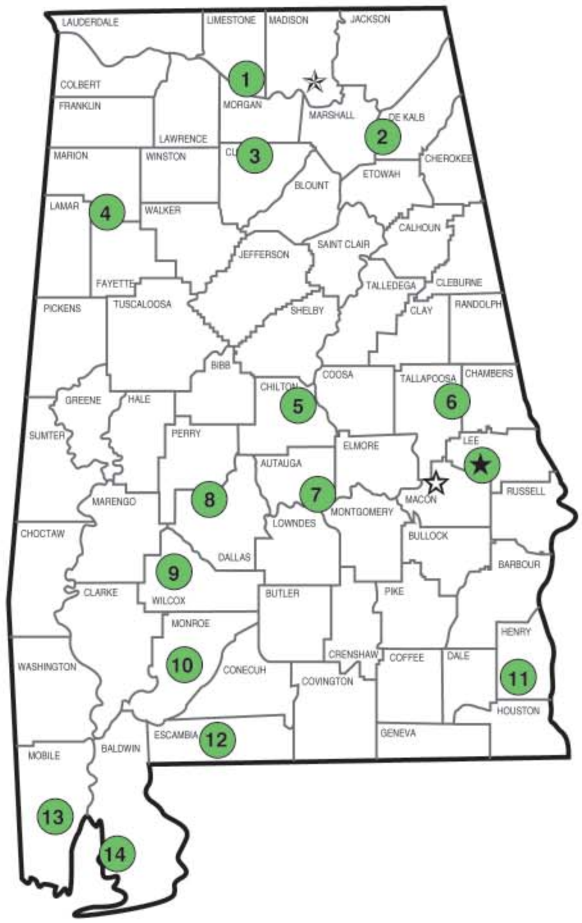
[2] Vigor ratings based on 1-5 scale, 1 being least vigorous and 5 being the most vigorous.

Means followed by same letter do not significantly differ by Fisher's LSD ($P \leq 0.10$).

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.