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APPLIED RESEARCH ON

FIELD CROP DISEASE CONTROL

2014

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POLICY FOR ACCEPTANCE OF PESTICIDES FOR TESTING

Research on synthesis and exploration of agricultural chemicals and biotechnology for use in pest control continues to provide new materials for field evaluation. Compounds are being made available by private companies and universities for local research in a variety of ways; ranging from a sample with a code number to a thoroughly-tested material, with secure patents, technical data sheets, and comprehensive résumés of results of laboratory and field trials. Unfortunately, it is not possible for a scientist to include all materials and use patterns in a field research demonstration program. Therefore, materials are selected according to (i) overall need for a product in a particular crop or problem area, and (ii) overall promise of the material to improve crop management at the local level.

Before a material can be accepted for testing, the following descriptive information is required: (i) a list of the spectrum of biological activity, (ii) data on phytotoxicity and suggested rates of application, (iii) methods of application, (iv) available formulations, (v) mammalian toxicity (LD_{50}), (vi) possible health hazards, and (vii) potential hazards to the environment. Additional information that would be desirable includes: (i) identity of the active ingredient(s) and inert materials, (ii) physical properties (solubility, MP, VP, stability, etc.), (iii) residue information, (iv) residual soil life, (v) EPA residue tolerance (if any) and registration status, (vi) patent status, and (vii) unit cost in commercial markets.

Upon completion of field applications, it is the responsibility of the sponsor to dispose of all unused test materials. Because of limited space in controlled pesticide storage facilities and expenses associated with shipping and disposal, all sponsors are encouraged to ship not more than 1.5 times the anticipated quantity needed to complete a test.

INTRODUCTION

Rainfall in Jun, Jul, and Oct was 0.96, 1.27, and 2.16 in. below normal, respectively; rainfall in May, Aug, and Sep was 0.94, 0.90, and 2.57 in. above normal. Rainfall during the period totaled 28.01 in., which was 0.02 in. above normal. Average minimum air temperatures were normal (±1°F) in May, 2°F below normal in Sep and Oct, 5°F below normal in Jun, 7°F in Jul, and 8°F below normal in Aug. Average maximum air temperatures were 7 °F above normal in May, 3°F above normal in Jun, 2°F above normal in Sep, normal (±1°F) in Jul, and 2°F below normal in Aug, according to records from the NOAA station #44-4044-01 at the Tidewater AREC in Suffolk. Normal represented the mean for the past 81 yrs of records.

Daily soil temperatures at the 4-in. depth were cool prior to May, but during the planting period beginning 1 May, daily soil temperatures averaged between 63°F and 75°F through 31 May and reached 80°F on 17 June. These conditions were favorable conditions for rapid emergence and good seedling vigor. Seasonal accumulations of peanut heat units (DD_{56}) and cotton degree days (DD_{60}) in 2014 were above the 19-yr average (Table 1). Peanut harvest was completed in October while cotton and soybean harvest were mostly complete in November. The first killing frost in southeastern Virginia was on 3 November when temperatures dropped to 26.8ºF.

Peanut was harvested on 19,000 acres in 2014 and yields averaged 4000 lb/A, 200 lb/A below the record yield of 4200 lb/A in 2012 (Table 2). The yield loss estimate for peanut diseases was 9.3% which equals 3,534 tons of peanuts or $1.5 million in farm income based a total production of 38,000 tons and a value of $412/ton (Table 3). Conditions were favorable for Sclerotinia blight throughout the season, and the disease was estimated to have contributed to 3% yield loss in 2014. Leaf spot diseases were first observed in August, and outbreaks occurred throughout September. Cylindrocladium black rot and tomato spotted wilt virus (TSWV) were present but incidence was relatively low. Nematodes, including northern root-knot nematode, caused damage to roots and pods in fields having moderate to high populations of these pests.

Cotton was harvested on 87,000 acres and yields in Virginia averaged 1,284 lb/A, or 166 lb above the previous record high for cotton in 2012 (Table 2). Stand losses due to seedling diseases were caused by *Rhizoctonia* and *Pythium* damping-off, but incidence and impact on production were low in 2014 (Table 4). Common foliar diseases were caused by fungi that included species of *Stemphylium*, *Alternaria*, *Colletotrichum*, and *Cercospora*. *Corynespora* target spot was detected in the lower canopy of cotton in late August but did not contribute to significant levels of yield loss. Yield losses caused by nematodes totaled 3.0% of yield potential with southern root-knot nematode accounting for the greatest loss. The estimated loss to all diseases totaled 6.3% of yield potential. This estimate indicates growers in Virginia lost 7.1 million pounds of lint or $4.34 million to diseases in 2014.

Soybean yields averaged 41 bu/A in 2014 on 640,000 acres (Table 2). Yield loss to diseases in 2014 was estimated to be 9.64%. This estimate indicates growers in Virginia lost 2.53 million bushels or $25.8 million to diseases in 2014. Soybean cyst nematode, southern root-knot nematode, frogeye leaf spot, and Cercospora blight accounted for the greatest losses of yield (Table 5). Sudden death syndrome was higher than in previous years and accounted for 1% yield loss. Asian soybean rust was not detected in 2014.

Corn yields averaged 142 bu/A in 2014 on 350,000 acres (Table 2). Seedling disease caused minimal losses of stand. Southern corn rust was detected in July, but foliar diseases caused only minor damage in widely scattered areas. As a whole, stalk rots and foliar diseases of corn showed low incidence and did not cause significant losses of yield in 2014.

Wheat yields averaged 68 bu/A on 260,000 acres (Table 2). Leaf blotch was the most common disease of wheat in southeastern Virginia. Incidence of powdery mildew and rusts was minimal in 2014.

Scab was widespread and moderate to severe in Virginia and contributed to loss of grain yield and quality.

The research described in this book was designed to evaluate strategies for improving disease control and the efficiency of crop production in Virginia. Commercial products are named for informational purposes only. Virginia Cooperative Extension, Virginia Polytechnic Institute and State University, and Virginia State University do not advocate or warrant products named nor do they intend or imply discrimination against those not named.

The primary purpose of this book is to provide cooperators and contributors a summary of the results of field research. Data summaries and conclusions in five chapters from this book have been submitted to the American Phytopathological Society for publication in *Plant Disease Management Reports* in 2015. Reprints of these publications are available upon request.

Table 1. Comparison of rainfall, peanut heat units (DD_{56}) and cotton degree-days (DD_{60}) in 2014 to an average of historical records at the Tidewater AREC.

Rainfall (in.)

Month	2007	2008	2009	2010	2011	2012	2013	2014	Normal[1]
May	2.16	3.43	4.60	6.77	2.23	5.74	2.96	4.76	3.82
Jun	3.00	1.56	3.40	0.83	4.28	4.80	7.11	3.41	4.37
Jul	1.71	5.58	4.86	1.01	7.96	2.67	3.18	3.89	5.16
Aug	5.00	2.18	3.38	2.04	14.21	10.43	3.72	6.61	5.71
Sep	0.43	6.01	7.69	8.75	8.96	4.14	1.64	7.88	5.31
Oct	5.26	0.87	1.72	8.24	3.34	7.11	1.43	1.46	3.62
Total	17.56	19.63	25.65	27.64	40.98	34.89	20.04	28.01	27.99

[1]Normal is mean of past 81 yrs (1933-2014).

Peanut Heat Units (DD_{56})

Month	2007	2008	2009	2010	2011	2012	2013	2014	Avg.[2]
May	319	321	424	457	433	429	355	437	373
Jun	547	695	580	738	645	512	580	598	588
Jul	629	663	635	783	776	774	707	659	699
Aug	664	610	685	703	675	643	589	609	650
Sep	455	482	402	539	503	420	390	513	452
Oct	368	186	204	232	195	213	255	266	222
Total	2982	2957	2930	3453	3227	2990	2876	3082	2984

[2]Avg. is mean of previous 18 yrs (1995-2013).

Cotton Degree Days (DD_{60})

Month	2007	2008	2009	2010	2011	2012	2013	2014	Avg.[2]
May	230	229	318	346	332	318	260	331	275
Jun	431	585	460	624	529	403	463	484	473
Jul	508	540	513	676	665	652	583	535	579
Aug	541	488	561	580	551	519	469	485	528
Sep	351	367	292	430	385	319	295	397	343
Oct	273	126	136	160	131	145	169	185	148
Total	2334	2335	2280	2816	2593	2357	2239	2417	2347

[2]Avg. is mean of previous 18 yrs (1995-2013).

Table 2. Crop production statistics in year of record yield compared to 2014.

	Statistics of record year for yield			2014 projection[1]	
Crop	Year	Acreage	Yield/A	Acreage	Yield/A
Peanut.....	2012	20,000	4,200 lb	19,000	4,000 lb
Soybean.....	2012	580,000	42 bu	640,000	41 bu
Corn	2013	355,000	150 bu	350,000	142 bu
Cotton (lint).....	2012	85,000	1,118 lb	87,000	1284 lb
Wheat	2008	280,000	71 bu	260,000	68 bu

[1] Crop production estimates issued in December 2014 by the National Agricultural Statistics Service at http://www.nass.usda.gov/va.

Table 3. Estimated loss in yield to peanut diseases in 2014.

Disease	Causal organism	Percent loss
Early leaf spot	*Cercospora arachidicola*	1.0
Late leaf spot	*Cercosporidium personatum*	1.0
Pepper spot & leaf scorch	*Leptosphaerulina crassiasca*	0.0
Web blotch	*Phoma arachidicola*	0.1
Botrytis blight	*Botrytis* sp.	0.0
Peanut rust	*Puccinia arachidis*	0.0
Sclerotinia blight	*Sclerotinia minor*	3.0
Southern stem rot	*Sclerotium rolfsii*	0.1
Stem, root, & pod rot	*Rhizoctonia* spp.	0.1
Pythium pod rot	*Pythium* spp.	0.0
Tomato spotted wilt virus	Tomato Spotted Wilt Virus	1.0
Cylindrocladium black rot (CBR)	*Cylindrocladium parasiticum*	1.0
Nematode damage	Northern Root Knot, Sting, Lesion, etc.	2.0
Total loss (%)		**9.3[1]**

[1] The loss estimate equals 3,534 tons of peanuts or $1.5 million in farm income based on an estimated total production of 38,000 tons and an estimated value of $412/ton.

Table 4. Estimated loss of yield to cotton diseases in 2014.

Disease	Causal agent(s)	Percent loss
Seedling disease	*Rhizoctonia solani, Pythium* spp.	2.0
Fusarium wilt	*Fusarium oxysporum* f. sp. *vasinfectum*	0.0
Verticillium wilt	*Verticillium dahlia*	0.0
Texas root rot	*Phymatotrichum omnivorum*	0.0
Ascochyta blight	*Ascochyta gossypii*	0.1
Bacterial blight	*Xanthomonas* spp.	0.0
Boll rots	*Diplodia, Fusarium, Xanthomonas.*	1.0
Leaf spots	*Corynespora, Alternaria, Cercospora*, etc.	0.2
Southern root-knot nematode	*Meloidogyne incognita*	2.0
Reniform nematode	*Rotylenchulus reniformis*	0.0
Other nematodes	*Trichodorus* spp., *Belonolaimus* spp., etc.	1.0
Total loss (%)		**6.3[1]**

[1] The loss estimate equals 7.1 million pounds in Virginia based on production of 112 million pounds of lint in 2014. At a value of $0.62 per pound, the loss in revenues at the farm gate would total $4.34 million.

Table 5. Estimated loss of yield to soybean diseases in 2014.

Disease	Causal agent(s)	Percent loss
Seedling diseases	*Rhizoctonia spp.*, *Pythium* spp., etc.	0.1
Seed rot	*Diaporthe/Phomopsis* complex	0.1
Cercospora blight	*Cercospora kikuchii*	1.0
Purple seed stain	*Cercospora kikuchii*	0.1
Downy mildew	*Peronospora manshurica*	0.01
Target spot	*Corynespora cassiicola*	0.1
Anthracnose	*Colletotrichum truncatum*	0.2
Brown spot	*Septoria glycines*	0.1
Rhizoctonia aerial blight	*Rhizoctonia solani*	0.01
Pod & stem blight	*Diaporthe phaseolorum* var. *sojae*	0.3
Soybean rust	*Phakopsora pachyrhizi*	0.0
Frogeye leaf spot	*Cercospora sojina*	2.0
Southern blight	*Sclerotium rolfsii*	0.0
Brown stem rot	*Phialophora gregata*	0.1
Charcoal rot	*Macrophomina phaseolina*	0.0
Stem canker	*Diaporthe phaseolorum* var. *caulivora*	0.5
Sudden death syndrome	*Fusarium solani* f.sp. *glycines*	1.0
Phytophthora root & stem rot	*Phytophthora megasperma* f.sp. *glycinea*	0.1
Sclerotinia stem rot	*Sclerotinia sclerotiorum* and *S. minor*	0.0
Viruses	SMV, PMV, BPMV, etc.	0.0
Bacterial diseases	*Pseudomonas syringae, P. syringae* pv. *tabaci*, *Xanthomonas campestris* pv. *glycines*	0.01
Soybean cyst nematode	*Heterodera glycines*	3.0
Southern root-knot nematode	*Meloidogyne incognita*	1.0
Total loss (%)		**9.64**[1]

[1] The loss estimate equals 2.53 million bushels based on production of 26.2 million bushels in 2014. At a value of $10.20/bu, the loss would be $25.8 million in farm revenue.

I. WHEAT FUNGICIDE TEST (WHEATFUN114, TAREC Research Farm, Field 28)

A. PURPOSE: To compare foliar fungicides for disease control in wheat.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Plots 12-ft wide and 30-ft long with 6.67-in. row spacing
3. Data collected from the center, seven rows in each plot.

C. APPLICATION OF TREATMENTS: Fungicide treatments were applied with a Lee Spider Sprayer having eight, 8002VS nozzles spaced 18-in. apart and delivering 19.88 gal/A. Fungicide sprays were applied at Feekes 5 on 2 Apr and Feekes 10.5 on 5 May. All treatments were applied with crop oil concentrate (1.0% v/v).

D. TREATMENT, RATE/A AND APPLICATION TIMING:
1. Untreated
2. Quilt Xcel 2.2SE 10.5 fl oz (Feekes 10.5)
3. A15457K EC 4.1 oz
   + Tilt 3.6EC 4 fl oz
   + Quadris 2.08SC 6 fl oz (Feekes 10.5)
4. A15457K EC 2.74 fl oz
   + Tilt 3.6EC 4 fl oz (Feekes 10.5)
5. Tilt 3.6EC 2 fl oz (Feekes 5)
   Quilt Xcel 2.2SE 10.5 fl oz (Feekes 10.5)
6. Quilt Xcel 2.2SE 10.5 fl oz
   + A15457K EC 4.1 fl oz (Feekes 10.5)
7. Tilt 3.6EC 2 fl oz (Feekes 5)
   Quilt Xcel 2.2SE 10.5 fl oz
   + A15457K EC 4.1 fl oz (Feekes 10.5)
8. A15457K EC 2.05 fl oz
   + Tilt 3.6EC 2 fl oz
   + Quadris 2.08 SC 4 fl oz (Feekes 5)
   Quilt Xcel 2.2SE 10.5 fl oz (Feekes 10.5)
9. Aproach 2.08SC 3 fl oz (Feekes 5)
   Aproach Prima 2.34SC 6.8 fl oz (Feekes 10.5)
10. Aproach Prima 2.34SC 6.8 fl oz (Feekes 10.5)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, wheat/soybean 2012, peanut 2011
3. Planting date and variety: 26 Oct 2013, USG 3665
4. Soil fertility report (Jan 2014):

pH	6.7	K	86 ppm
Ca.....	674 ppm	Zn.....	0.2 ppm
Mg.....	61 ppm	Mn	1.9 ppm
P	41 ppm	Soil type.....	Kenansville loamy fine sand

5. Fertilizer: 5-13-30 355 lb/A (23 Oct 2013)
   Liquid nitrogen (24%) 60 lb/A (20 Feb, 14 Mar)
6. Herbicide: Harmony Extra 0.6 fl oz/A (20 Feb, 14 Mar)
7. Harvest date: 16 Jun 2014

Table 6. Effect of fungicide treatments on disease severity in wheat.

Treatment, rate/A and timing[1]	% leaf blotch[2]						
	21 Apr	2 May		14 May		19 May	
	Lower leaves	Flag-3	Flag-2	Flag-2	Flag-1	Flag-1	Flag leaf
Untreated	17.4 ab	36.0	6.0	39.0 a	9.0	14.4	1.0
Quilt Xcel 10.5 fl oz (F10.5)	17.0 ab	31.0	4.4	27.0 d	3.6	9.8	1.0
A15457K EC 4.1 oz + Tilt 3.6EC 4 fl oz + Quadris 2.08SC 6 fl oz (F10.5)	13.6 bc	31.0	5.2	29.0 cd	4.4	10.0	1.0
A15457K EC 2.74 fl oz + Tilt 3.6EC 4 fl oz (F10.5)	20.4 a	34.0	7.0	30.0 b-d	7.2	12.0	1.0
Tilt 3.6EC 2 fl oz (F5) Quilt Xcel 10.5 fl oz (F10.5)	6.0 de	29.0	5.4	30.0 b-d	6.2	9.4	1.0
Quilt Xcel 10.5 fl oz + A15457K EC 4.1 fl oz (F10.5)	12.8 ce	31.0	6.2	31.0 b-d	5.2	8.0	1.0
Tilt 3.6EC 2 fl oz (F5) Quilt Xcel 10.5 fl oz + A15457K EC 4.1 fl oz (F10.5)	4.6 e	31.0	5.2	34.0 b	8.0	10.0	1.0
A15457K EC 2.05 fl oz + Tilt 3.6EC 2 fl oz + Quadris 2.08SC 4 fl oz (F5) Quilt Xcel 10.5 fl oz (F10.5)	4.2 e	27.0	2.6	32.0 bc	9.0	10.4	1.0
Aproach 2.08SC 3 fl oz (F5) Aproach Prima 6.8 fl oz (F10.5)	5.2 e	29.0	4.2	32.0 bc	9.0	8.0	1.0
Aproach Prima 6.8 fl oz (F10.5)	9.8 cd	32.0	6.0	34.0 b	7.0	9.4	1.0
P(F)	**0.0001**	0.58	0.48	**0.002**	0.09	0.22	1.0

[1] Treatments were applied at Feekes 5 (F5) on 2 Apr and Feekes 10.5 (F10.5) on 5 May. All treatments were applied with crop oil concentrate at 1.0% v/v.

[2] Percent of leaf area with signs and symptoms of disease. No disease was present on 11 Apr.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).
Percentage data were arcsine transformed prior to statistical analysis.

Table 7. Effect of fungicide treatments on yield and test weight in wheat.

Treatment, rate/A and timing[1]	**Yield (bu/A)[2]**	**Test weight (lb/bu)**	**Weight (gr) /1000 seed**
Untreated	94.9 c	55.4	31.0 a
Quilt Xcel 10.5 fl oz (F10.5)	101.5 ab	56.2	30.8 a
A15457K EC 4.1 oz + Tilt 3.6EC 4 fl oz + Quadris 2.08SC 6 fl oz (F10.5)	103.8 a	56.6	31.0 a
A15457K EC 2.74 fl oz + Tilt 3.6EC 4 fl oz (F10.5)	100.0 a-c	56.2	29.4 b
Tilt 3.6EC 2 fl oz (F5) Quilt Xcel 10.5 fl oz (F10.5)	99.9 a-c	56.4	32.0 a
Quilt Xcel 10.5 fl oz + A15457K EC 4.1 fl oz (F10.5)	97.8 bc	56.0	31.6 a
Tilt 3.6EC 2 fl oz (F5) Quilt Xcel 10.5 fl oz + A15457K EC 4.1 fl oz (F10.5)	102.1 ab	56.2	30.8 a
A15457K EC 2.05 fl oz + Tilt 3.6EC 2 fl oz + Quadris 2.08SC 4 fl oz (F5) Quilt Xcel 10.5 fl oz (F10.5)	104.8 a	55.9	31.4 a
Aproach 2.08SC 3 fl oz (F5) Aproach Prima 6.8 fl oz (F10.5)	102.9 ab	55.9	31.4 a
Aproach Prima 6.8 fl oz (F10.5)	101.4 ab	55.6	31.6 a
P(F)	**0.04**	0.07	**0.05**

[1] Treatments were applied at Feekes 5 (F5) on 2 Apr and Feekes 10.5 (F10.5) on 5 May. All treatments were applied with crop oil concentrate at 1.0% v/v.

[2] Yields are weight of wheat with 13.5% moisture. One bushel equals 60 lbs. Wheat was harvested on 16 Jun 2014. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

II. WHEAT FUNGICIDE TEST (WHEATFUN214, TAREC Research Farm, Field 28)

A. PURPOSE: To compare fungicide treatments for foliar disease control and impact on yield in wheat.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Plots 12-ft wide and 30-ft long with 6.67-in. row spacing
3. Data collected from the center, seven rows in each plot.

C. APPLICATION OF TREATMENTS: Fungicide treatments were applied with a Lee Spider Sprayer having eight, 8002VS nozzles spaced 18-in. apart and delivering 19.88 gal/A. Fungicide sprays were applied at Feekes 5 on 2 Apr and Feekes 10.5 on 5 May. All treatments were applied with Induce 3.2 fl oz/A (0.125% v/v).

D. TREATMENT, RATE/A AND APPLICATION TIMING:
1. Untreated
2. Priaxor 4.17SC 2 fl oz (Feekes 5)
3. Tilt 3.6EC 4 fl oz (Feekes 5)
4. Folicur 3.6F 2 fl oz (Feekes 5)
5. Quilt Xcel 2.2SC 5 fl oz (Feekes 5)
6. Caramba 0.75EC 4 fl oz (Feekes 5)
7. Aproach Prima SC 3 fl oz (Feekes 5)
8. Twinline 1.75EC 9 fl oz (Feekes 10.5)
9. Quilt Xcel 2.2SC 10.5 fl oz (Feekes 10.5)
10. Custodia 2.67SC 8.6 fl oz (Feekes 10.5)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, wheat/soybean 2012, peanut 2011
3. Planting date and variety: 26 Oct 2013, USG 3665
4. Soil fertility report (Jan 2014):

pH	6.7	K	86 ppm
Ca.....	674 ppm	Zn.....	0.2 ppm
Mg.....	61 ppm	Mn	1.9 ppm
P	41 ppm	Soil type.....	Kenansville loamy fine sand

5. Fertilizer: 5-13-30 355 lb/A (23 Oct 2013)
   Liquid nitrogen (24%) 60 lb/A (20 Feb, 14 Mar)
6. Herbicide: Harmony Extra 0.6 fl oz/A (20 Feb, 14 Mar)
7. Harvest date: 16 Jun 2014

Table 8. Effect of fungicide treatments on disease severity in wheat.

	% leaf blotch[2]						
	14 Apr		21 Apr	2 May		14 May	
Treatment, rate/A and timing[1]	**1st leaf**	**2nd leaf**	**Lower leaves**	**Flag-3**	**Flag-2**	**Flag-2**	**Flag-1**
Untreated	12.0 a	3.2	11.8 b	36.0	5.0	35.0	12.0 a
Priaxor 4.17SC 2 fl oz (F5)	5.8 d	1.0	7.8 cd	29.0	2.6	39.0	11.0 a
Tilt 3.6EC fl oz (F5)	6.0 d	1.6	5.8 d	31.0	2.6	34.0	10.0 ab
Folicur 3.6F 2 fl oz (F5)	6.4 cd	2.0	5.8 d	31.0	4.2	35.0	11.0 a
Quilt Xcel 5 fl oz (F5)	5.2 d	1.4	7.0 cd	30.0	3.4	38.0	12.0 a
Caramba 0.75EC 4 fl oz (F5)	9.0 bc	2.6	7.8 cd	34.0	4.2	36.0	9.0 a-c
Aproach Prima 3 fl oz (F5)	7.2 bc	1.8	9.6 bc	30.0	4.2	33.0	7.0 b-d
Twinline 1.75EC 9 fl oz (F10.5)	11.0 ab	2.6	16.0 a	35.0	5.0	32.0	5.0 d
Quilt Xcel 10.5 fl oz (F10.5)	10.0 ab	2.4	16.0 a	30.0	4.2	35.0	9.0 a-c
Custodia 8.6 fl oz (F10.5)	10.4 ab	3.0	17.4 a	32.0	5.0	32.0	6.0 cd
P(F)	**0.0001**	0.06	**0.0001**	0.27	0.10	0.08	**0.0008**

[1] Treatments were applied at Feekes 5 (F5) on 2 Apr and Feekes 10.5 (F10.5) on 5 May. All treatments were applied with Induce 3.2 fl oz/A (0.125% v/v).

[2] Percent of leaf area with signs and symptoms of disease. No disease was observed on 11 Apr.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).
Percentage data were arcsine transformed prior to statistical analysis.

Table 9. Effect of fungicide treatments on disease severity, yield, and test weight in wheat.

	% leaf blotch[2] (19 May)			
Treatment, rate/A and timing[1]	**Flag-1**	**Flag leaf**	**Yield (bu/A)[3]**	**Test weight (lb/bu)**
Untreated	16.4 ab	1.0	96.5 c	57.1 a-c
Priaxor 4.17SC 2 fl oz (F5)	13.8 bc	1.0	98.2 bc	56.8 c
Tilt 3.6EC fl oz (F5)	15.0 ab	1.0	97.0 c	57.0 a-c
Folicur 3.6F 2 fl oz (F5)	18.0 a	1.0	98.7 a-c	56.8 c
Quilt Xcel 5 fl oz (F5)	18.0 a	1.0	97.4 bc	56.4 c
Caramba 0.75EC 4 fl oz (F5)	13.4 bc	1.0	96.1 c	56.9 c
Aproach Prima 3 fl oz (F5)	15.0 ab	1.0	95.0 c	57.0 bc
Twinline 1.75EC 9 fl oz (F10.5)	11.0 c	1.0	103.1 a	57.8 a
Quilt Xcel 10.5 fl oz (F10.5)	13.0 bc	1.0	102.0 ab	57.8 ab
Custodia 8.6 fl oz (F10.5)	13.0 bc	1.0	98.5 a-c	57.2 a-c
P(F)	**0.01**	1.0	**0.04**	**0.03**

[1] Treatments were applied at Feekes 5 (F5) stage on 2 Apr and Feekes 10.5 (F10.5) stage on 5 May. All treatments were applied with Induce 3.2 fl oz/A (0.125% v/v).

[2] Percent of leaf area with signs and symptoms of disease.

[3] Yields are weight of wheat with 13.5% moisture. One bushel equals 60 lbs. Wheat was harvested on 16 Jun 2014. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

III. WHEAT FUNGICIDE TEST (WHEATFUN314, TAREC Research Farm, Field 28)

A. PURPOSE: To compare fungicides for control of foliar diseases in wheat.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Plots 12-ft wide and 30-ft long with 6.67-in. row spacing
3. Data collected from the center, seven rows in each plot.

C. APPLICATION OF TREATMENTS: Fungicide treatments were applied with a Lee Spider Sprayer having eight, 8002VS nozzles spaced 18-in. apart and delivering 19.88 gal/A. Fungicide sprays were applied at Feekes 5 on 2 Apr and Feekes 10.5 stge on 5 May. All treatments were applied with Induce 3.2 fl oz/A (0.125% v/v).

D. TREATMENT, RATE/A AND APPLICATION TIMING:
1. Untreated
2. Stratego YLD 500SC 2 fl oz (Feekes 5)
3. Stratego YLS 500SC 4 fl oz (Feekes 10.5)
4. Absolute 500SC 4 fl oz (Feekes 10.5)
5. Prosaro 421SC 5 fl oz (Feekes 10.5)
6. Prosaro 421SC 6.5 fl oz (Feekes 10.5)
7. Prosaro 421SC 6.5 fl oz (Feekes 10.5)
8. Stratego YLD 500SC 2 fl oz (Feekes 5)
   Prosaro 421SC 6.5 fl oz (Feekes 10.5)
9. Tilt 3.6EC 4 fl oz (Feekes 10.5)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, wheat/soybean 2012, peanut 2011
3. Planting date and variety: 26 Oct 2013, USG 3665
4. Soil fertility report (Jan 2014):

pH	6.7	K	86 ppm
Ca.....	674 ppm	Zn.....	0.2 ppm
Mg.....	61 ppm	Mn	1.9 ppm
P	41 ppm	Soil type.....	Kenansville loamy fine sand

5. Fertilizer: 5-13-30 355 lb/A (23 Oct 2013)
   Liquid nitrogen (24%) 60 lb/A (20 Feb, 14 Mar)
6. Herbicide: Harmony Extra 0.6 fl oz/A (20 Feb, 14 Mar)
7. Harvest date: 16 Jun 2014

Table 10. Effect of fungicide treatments on disease severity in wheat.

Treatment, rate/A and timing[1]	% leaf blotch[2]						
	21 Apr	5 May		14 May		19 May	
	Lower leaves	Flag-3	Flag-2	Flag-2	Flag-1	Flag-1	Flag leaf
Untreated	21.0	33.0	5.0	35.0	8.4 ab	13.4	1.0
Stratego YLD 2 fl oz (F5)	19.4	31.0	6.2	35.0	10.0 a	14.4	1.0
Stratego YLD 4 fl oz (F10.5)	21.0	- -	- -	34.0	7.4 a-d	13.0	1.0
Absolute 500SC 4 fl oz (F10.5)	22.0	- -	- -	31.0	6.8 b-e	13.8	1.0
Prosaro 421SC 5 fl oz (F10.5)	22.0	- -	- -	34.0	7.8 a-c	12.0	1.0
Prosaro 421SC 6.5 fl oz (F10.5)	18.0	- -	- -	31.0	4.2 e	11.4	1.0
Prosaro 421SC 6.5 fl oz (F10.5)	22.4	29.0	5.4	31.0	5.2 c-e	12.4	1.0
Stratego YLD 2 fl oz (F5) fb Prosaro 421SC 6.5 fl oz (F10.5)	16.4	- -	- -	32.0	4.6 de	13.0	1.0
Tilt 3.6EC 4 fl oz (F10.5)	23.0	- -	- -	34.0	8.4 ab	12.4	1.0
P(F)	0.48	0.24	0.86	0.24	**0.005**	0.63	1.0

[1] Treatments were applied at Feekes 5 (F5) on 2 Apr and Feekes 10.5 (F10.5) on 5 May. All treatments were applied with Induce 3.2 fl oz/A 0.125% v/v.

[2] Percent leaf area with signs and symptoms of disease. No disease was observed on 11 Apr.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).
Percentage data were arcsine transformed prior to statistical analysis.

Table 11. Effect of fungicide treatments on yield and test weight in wheat.

Treatment, rate/A and timing[1]	Yield (bu/A)[2]	Test weight (lb/bu)
Untreated	88.7	56.0
Stratego YLD 2 fl oz (F5)	89.7	56.4
Stratego YLD 4 fl oz (F10.5)	94.0	57.0
Absolute 500SC 4 fl oz (F10.5)	92.8	57.2
Prosaro 421SC 5 fl oz (F10.5)	92.2	57.1
Prosaro 421SC 6.5 fl oz (F10.5)	94.0	56.1
Prosaro 421SC 6.5 fl oz (F10.5)	89.9	56.5
Stratego YLD 2 fl oz (F5) fb Prosaro 421SC 6.5 fl oz (F10.5)	95.2	56.6
Tilt 3.6EC 4 fl oz (F10.5)	90.7	56.7
P(F)	0.18	0.18

[1] Treatments were applied at Feekes 5 (F5) on 2 Apr and Feekes 10.5 (F10.5) on 5 May. All treatments were applied with Induce 3.2 fl oz/A 0.125% v/v.

[2] Yields are weight of wheat with 13.5% moisture. One bushel equals 60 lbs. Wheat was harvested on 16 Jun 2014.

IV. EVALUATION OF YIELD RESPONSE TO IN-FURROW SERENADE APPLICATIONS IN CORN (CORN114, TAREC Research Farm, Suffolk, Field 34A)

A. PURPOSE: To evaluate corn yield responses to in-furrow applications of Serenade.

B. EXPERIMENTAL DESIGN:
1. Six, 30-ft rows per plot
2. Eight-ft alleyways between blocks
3. Five replications in a randomized complete block design

C. APPLICATION OF TREATMENTS: F = in seed furrow at planting mixed in water to make a volume of 5 gal/A and applied through microtubes (12 Apr)

D. TREATMENT, RATE/A (F):
1. Untreated
2. Serenade Soil 32 fl oz

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Cotton 2013, peanut 2012, corn 2011
3. Land preparation: strip tillage, 10 Apr
4. Planting date and cultivar: 12 Apr, DK 64-69
5. Soil fertility report (Jan 2014):

pH	6.4	K.....	96 ppm
Ca.....	417 ppm	Zn	0.3 ppm
Mg.....	46 ppm	Mn	1.7 ppm
P	56 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide:
Pre-plant – Touchdown 1.0 qt/A (4 Apr)
Gramaxone Inteon 1.0 pt/A (9 Apr)
Pre-emergence – Brawl 2.0 qt/A + Atrazine 1.0 qt/A (14 Apr)
7. Additional crop management:
a. 7-18-36 300 lb/A (27 Mar)
b. 11-37-0 10 gal + CMC 1 qt/A (11 Apr)
c. Nitrogen 24-0-0-3 60 units/A (14 Apr, 23 May)
d. Irrigation: ca. 1" (7 Jul)
8. Harvest date: 11 Sep

Table 12. Effect of treatment on yield in corn.

Treatment, rate/A[1]	**Yield[2] (bu/A)**	**Test weight (lb/bu)**
Untreated check	124.0	55.4
Serenade Soil 32 fl oz	116.9	55.8
P(F)	0.17	0.22

[1] Applied in-furrow at planting on 12 May.
[2] Yields are weight of corn adjusted to moisture content of 15.5%. Corn was harvested on 11 Sep. One bushel = 56 lbs of grain.

V. EVALUATION OF FUNGICIDES FOR FOLIAR DISEASE CONTROL IN CORN (CORNFOLFUN114, TAREC Research Farm, Suffolk, Field 34A)

A. PURPOSE: To compare fungicides for control of foliar diseases in corn.

B. EXPERIMENTAL DESIGN:
1. Six, 30-ft rows per plot
2. Eight-ft alleyways between blocks
3. Five replications in a randomized complete block design

C. APPLICATION OF TREATMENTS: Foliar sprays were applied with a Lee Spider sprayer at 38 psi with two, 8002VS nozzles/row delivering 19.88 gal/A. Fungicides were applied at V3-V5 (3-5 collars) on 28 May and R1 (silking) on 24 Jun. All treatments were applied with Induce 3.2 fl oz/A (0.125% v/v).

D. TREATMENT, RATE/A AND APPLICATION TIMING:
1. Untreated check
2. Quilt Xcel 2.2SE 10.6 fl oz (R1)
3. Aproach Prima 280SC 3.4 fl oz (R1)
4. A15457B EC 2.05 fl oz (R1)
   + Quadris 2.08SC 6.0 fl oz (R1)
   + Tilt 3.6EC 4.03 oz (R1)
5. A15457B EC 4.1 fl oz (R1)
   + Quadris 2.08SC 6.0 fl oz (R1)
   + Tilt 3.6EC 4.03 oz (R1)
6. A15457B EC 4.1 fl oz (R1)
   + Quilt Xcel 2.2SE 10.6 fl oz (R1)
7. Aproach 2.08SC 3.0 fl oz (V3-V5)
   + Abundit Extra 3.0SL 1.0 qt (V3-V5)
   Asana XL 9.6 fl oz (R1)
   + Aproach Prima 280SC 6.8 fl oz (R1)
8. Aproach Prima 280SC 6.8 fl oz (R1)
   + Asana XL 9.6 fl oz (R1)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Cotton 2013, peanut 2012, corn 2011
3. Land preparation: strip tillage, 10 Apr
4. Planting date and variety: 12 Apr, DK 64-69
5. Soil fertility report (Jan 2014):

pH	6.4	K.....	96 ppm
Ca.....	417 ppm	Zn	0.3 ppm
Mg.....	46 ppm	Mn	1.7 ppm
P	56 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide:
   Pre-plant – Touchdown 1.0 qt/A (4 Apr)
   Gramaxone Inteon 1.0 pt/A (9 Apr)
   Pre-emergence – Brawl 2.0 qt/A + Atrazine 1.0 qt/A (14 Apr)

7. Additional crop management:
   a. 7-18-36 300 lb/A (27 Mar)
   b. 11-37-0 10 gal + CMC 1 qt/A (11 Apr)
   c. Nitrogen 24-0-0-3 60 units/A (14 Apr, 23 May)
   d. Irrigation: ca. 1" (7 Jul)
8. Harvest date: 11 Sep

Table 13. Effect of treatments on disease severity in corn.

Treatment, rate/A and timing[1]	**% Northern corn leaf blight[2] (18 Jul)**	**% Southern corn leaf blight[2] (18 Jul)**	**% brown spot[2] (18 Jul)**	**% other leaf spot[2] (18 Jul)**
Untreated check	4.0	2.6	0.8	0.8
Quilt Xcel 2.2SE 10.6 fl oz (R1)	3.6	2.0	0.6	0.8
Aproach Prima 280SC 3.4 fl oz (R1)	4.0	1.6	0.4	0.8
A15457B EC 2.05 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	3.4	2.0	0.2	0.4
A15457B EC 4.1 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	4.0	1.8	0.6	0.6
A15457B EC 4.1 fl oz (R1) + Quilt Xcel 2.2SE 10.6 fl oz (R1)	4.4	1.6	0.4	0.6
Aproach 2.08SC 3.0 fl oz (V3-V5) + Abundit Extra 3.0SL 1.0 qt (V3-V5) Asana XL 9.6 fl oz (R1) + Aproach Prima 280SC 6.8 fl oz (R1)	4.4	1.8	1.0	1.0
Aproach Prima 280SC 6.8 fl oz (R1) + Asana XL 9.6 fl oz (R1)	3.6	1.8	0.6	1.2
P(F)	0.81	0.28	0.64	0.35

[1] Fungicides were applied at V3-V5 (3-5 collars) on 28 May and R1 (silking) on 24 Jun.
[2] Percent leaf area with symptoms, rated from two leaves below the ear and up.

Table 14. Effect of treatment on disease severity in corn, 8 Aug.

Treatment, rate/A, and timing[1]	% Northern corn leaf blight[2] (8 Aug)	% Southern corn leaf blight[2] (8 Aug)	% brown spot[2] (8 Aug)	% Southern rust[2] (8 Aug)	% eye spot[2] (8 Aug)
Untreated check	2.4	4.2 a	1.0	0.8	9.0 a
Quilt Xcel 2.2SE 10.6 fl oz (R1)	2.0	2.2 b	1.0	0.2	1.8 b
Aproach Prima 280SC 3.4 fl oz (R1)	3.2	2.6 b	1.4	0.4	1.8 b
A15457B EC 2.05 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	3.0	1.8 b	1.0	0.0	0.8 b
A15457B EC 4.1 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	3.6	3.0 ab	1.0	0.4	0.8 b
A15457B EC 4.1 fl oz (R1) + Quilt Xcel 2.2SE 10.6 fl oz (R1)	2.0	2.6 b	1.0	0.2	1.4 b
Aproach 2.08SC 3.0 fl oz (V3-V5) + Abundit Extra 3.0SL 1.0 qt (V3-V5) Asana XL 9.6 fl oz (R1) + Aproach Prima 280SC 6.8 fl oz (R1)	3.0	4.2 a	1.2	0.4	1.4 b
Aproach Prima 280SC 6.8 fl oz (R1) + Asana XL 9.6 fl oz (R1)	3.2	3.0 ab	1.2	0.8	1.6 b
P(F)	0.54	**0.002**	0.78	0.10	**0.0001**

[1] Fungicides were applied at V3-V5 (3-5 collars) on 28 May and R1 (silking) on 24 Jun.

[2] Percent leaf area with symptoms, rated from two leaves below the ear and up.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 15. Effect of treatment on senescence, lodging, and yield in corn.

Treatment, rate/A and timing[1]	% senescence (15 Aug)	% lodging[2] (28 Aug)	Yield[3] (bu/A)	Test weight (lb/bu)
Untreated check	64.0 a	3.6	139.5	55.0
Quilt Xcel 2.2SE 10.6 fl oz (R1)	58.0 ab	1.6	149.2	54.9
Aproach Prima 280SC 3.4 fl oz (R1)	58.0 ab	2.4	133.7	56.1
A15457B EC 2.05 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	59.0 ab	0.7	128.8	55.4
A15457B EC 4.1 fl oz (R1) + Quadris 2.08SC 6.0 fl oz (R1) + Tilt 3.6EC 4.03 oz (R1)	54.0 b	0.9	141.8	55.0
A15457B EC 4.1 fl oz (R1) + Quilt Xcel 2.2SE 10.6 fl oz (R1)	55.0 b	0.7	140.9	55.7
Aproach 2.08SC 3.0 fl oz (V3-V5) + Abundit Extra 3.0SL 1.0 qt (V3-V5) Asana XL 9.6 fl oz (R1) + Aproach Prima 280SC 6.8 fl oz (R1)	64.0 a	0.7	140.1	55.9
Aproach Prima 280SC 6.8 fl oz (R1) + Asana XL 9.6 fl oz (R1)	58.0 ab	0.5	134.2	55.8
P(F)	**0.03**	0.08	0.17	0.22

[1] Fungicides were applied at V3-V5 (3-5 collars) on 28 May and R1 (silking) on 24 Jun.

[2] Percent plants lodged.

[3] Yields are weight of corn with moisture content of 15.5%. Corn was harvested on 11 Sep. One bushel=56 lbs of grain. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

VI. EVALUATION OF FUNGICIDES FOR FOLIAR DISEASE CONTROL IN CORN (CORNFOLFUN214, TAREC Research Farm, Suffolk, Field 34A)

A. PURPOSE: To assess the efficacy of treatments for control of foliar diseases in corn.

B. EXPERIMENTAL DESIGN:
1. Six, 30-ft rows per plot
2. Eight-ft alleyways between blocks
3. Five replications in a randomized complete block design

C. APPLICATION OF TREATMENTS: Foliar sprays were applied with a Lee Spider sprayer at 38 psi with three, 8002VS nozzles/row delivering 19.88 gal/A at V5 (5 collars, 28 May) or VT (tassel emergence, 24 Jun). All treatments received Induce 3.2 fl oz/A (0.125% v/v).

D. TREATMENT, RATE/A AND APPLICATION TIMING:
1. Untreated check
2. Stratego YLD 500SC 4.0 fl oz (V5)
3. Stratego YLD 500SC 4.0 fl oz (VT)
4. Stratego YLD 500SC 2.0 fl oz (V5)
   Stratego YLD 500SC 4.0 fl oz (VT)
5. Headline AMP 10.0 fl oz (VT)
6. Quilt Xcel 10.5 fl oz (VT)
   + Headline SC 6.0 fl oz (VT)
7. Headline AMP 10.0 fl oz (VT)
8. Quilt Xcel 10.5 fl oz (VT)
9. Aproach SC 6 fl oz (VT)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Cotton 2013, peanut 2012, corn 2011
3. Planting date and variety: 12 Apr, DK 64-69
4. Soil fertility report (Jan 2014):

pH	6.4	K.....	96 ppm
Ca.....	417 ppm	Zn	0.3 ppm
Mg.....	46 ppm	Mn	1.7 ppm
P	56 ppm	Soil type	Kenansville loamy fine sand

5. Herbicide:
   Pre-plant – Touchdown 1.0 qt/A (4 Apr)
   Gramaxone Inteon 1.0 pt/A (9 Apr)
   Pre-emergence – Brawl 2.0 qt/A + Atrazine 1.0 qt/A (14 Apr)
6. Additional crop management:
   a. 7-18-36 300 lb/A (27 Mar)
   b. 11-37-0 10 gal + CMC 1 qt/A (11 Apr)
   c. Nitrogen 24-0-0-3 60 units/A (14 Apr, 23 May)
   d. Irrigation: ca. 1" (7 Jul)
7. Harvest date: 11 Sep

Table 16. Effect of treatments on disease severity in corn.

Treatment, rate/A, and timing[1]	% Northern corn leaf blight[2] (18 Jul)	% Southern corn leaf blight[2] (18 Jul)	% brown spot[2] (18 Jul)	% other leaf spot[2] (18 Jul)
Untreated check	3.6	2.0 a-c	1.2 ab	0.8
Stratego YLD 500SC 4.0 fl oz (V5)	2.6	2.8 a	1.0 ab	0.8
Stratego YLD 500SC 4.0 fl oz (VT)	4.0	2.0 a-c	1.2 ab	1.0
Stratego YLD 500SC 2.0 fl oz (V5) Stratego YLD 500SC 4.0 fl oz (VT)	3.0	2.2 ab	0.6 bc	1.0
Headline AMP 10.0 fl oz (VT)	3.2	2.2 ab	0.2 c	1.0
Quilt Xcel 10.5 fl oz (VT) + Headline SC 6.0 fl oz (VT)	3.8	2.0 a-c	0.8 a-c	1.0
Headline AMP 10.0 fl oz (VT)	2.8	1.6 bc	1.4 a	1.0
Quilt Xcel 10.5 fl oz (VT)	3.6	1.2 c	0.8 a-c	0.8
Aproach SC 6 fl oz (VT)	3.2	2.8 a	1.4 a	1.0
P(F)	0.37	**0.02**	**0.04**	0.97

[1] Fungicides were applied at V5 (5 collars, 28 May) or VT (tassel emergence, 24 Jun). All treatments received Induce 3.2 fl oz/A (0.125% v/v).

[2] Percent leaf area with symptoms, rated from two leaves below the ear and up.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 17. Effect of treatment on disease severity in corn.

Treatment, rate/A, and timing[1]	% Northern corn leaf blight[2] (8 Aug)	% Southern corn leaf blight[2] (8 Aug)	% brown spot[2] (8 Aug)	% Southern rust[2] (8 Aug)	% eye spot[2] (8 Aug)
Untreated check	3.4	3.6 a	1.6	1.0	6.8 a
Stratego YLD 500SC 4.0 fl oz (V5)	2.8	2.8 a-c	1.2	2.4	6.2 a
Stratego YLD 500SC 4.0 fl oz (VT)	3.2	3.4 ab	1.0	1.8	1.8 b
Stratego YLD 500SC 2.0 fl oz (V5) Stratego YLD 500SC 4.0 fl oz (VT)	2.4	2.2 c	0.8	1.0	4.4 ab
Headline AMP 10.0 fl oz (VT)	3.0	2.2 c	1.0	1.0	1.6 b
Quilt Xcel 10.5 fl oz (VT) + Headline SC 6.0 fl oz (VT)	2.2	2.0 c	1.0	0.6	1.4 b
Headline AMP 10.0 fl oz (VT)	2.4	2.4 bc	1.0	0.4	2.4 b
Quilt Xcel 10.5 fl oz (VT)	2.4	2.2 c	1.0	0.8	3.0 b
Aproach SC 6 fl oz (VT)	2.2	2.2 c	1.0	1.0	3.0 b
P(F)	0.67	**0.048**	0.10	0.08	**0.007**

[1] Fungicides were applied at V5 (5 collars, 28 May) or VT (tassel emergence, 24 Jun). All treatments received Induce 3.2 fl oz/A (0.125% v/v).

[2] Percent leaf area with symptoms, rated from two leaves below the ear and up.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 18. Effect of treatment on senescence, lodging, and yield of corn.

Treatment, rate/A, and timing[1]	**% senescence**	**% lodging[2]**	**Yield[3] (bu/A)**	**Test weight (lb/bu)**
Untreated check	68.0 a	2.9	146.4	55.7
Stratego YLD 500SC 4.0 fl oz (V5)	68.0 a	6.1	147.9	55.1
Stratego YLD 500SC 4.0 fl oz (VT)	69.0 a	3.0	153.5	56.3
Stratego YLD 500SC 2.0 fl oz (V5) Stratego YLD 500SC 4.0 fl oz (VT)	59.0 cd	4.4	155.7	55.5
Headline AMP 10.0 fl oz (VT)	57.0 d	0.7	150.5	55.5
Quilt Xcel 10.5 fl oz (VT) + Headline SC 6.0 fl oz (VT)	56.0 d	1.7	140.5	55.0
Headline AMP 10.0 fl oz (VT)	64.0 a-c	5.2	139.9	55.1
Quilt Xcel 10.5 fl oz (VT)	66.0 ab	4.9	142.2	54.9
Aproach SC 6 fl oz (VT)	60.0 b-d	2.7	143.0	55.0
P(F)	**0.0005**	0.16	0.12	0.07

[1] Fungicides were applied at V5 (5 collars, 28 May) or VT (tassel emergence, 24 Jun). All treatments received Induce 3.2 fl oz/A (0.125% v/v).

[2] Percent plants lodged.

[3] Yields are weight of corn with moisture content of 15.5%. Corn was harvested on 11 Sep. One bushel=56 lbs of grain. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

VII. NATIONAL COTTONSEED TREATMENT TEST – VIRGINIA LOCATION (COTSEEDFUN114, TAREC Research Farm, Field 9B)

A. PURPOSE: To evaluate seed treatment fungicides for control of damping-off diseases in cotton.

B. EXPERIMENTAL DESIGN:
1. Two, 30-ft rows per plot with 36-in row spacing
2. Seeding rate of 3.5 seed/ft of row
3. Four randomized complete blocks separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: All seed with the exception of the untreated control received Gaucho 600 12.8 oz/cwt seed. Treatments were applied by Dr. Craig Rothrock, Coordinator of National Cottonseed Treatment Trials at the University of Arkansas.

D. TREATMENT AND RATE/CWT SEED (unless otherwise indicated):
1. Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz
2. Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz
3. Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz + Evergol Energy 2.0 fl oz
4. Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed
5. Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed + A9625C 1.0 g ai+ A16148C 7.5 g ai + A9382A 11.0 g ai/100 kg seed
6. Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed + A9625C 1.0 g ai+ A16148C 10.0 g ai + A9382A 11.0 g ai/100 kg seed
7. Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz + Rizolex 1.5 fl oz
8. RTU-Baytan-Thiram 3.0 fl oz + Allegiance FL 0.75 fl oz
9. Vitavax-PCNB 6.0 fl oz + Allegiance FL 0.75 fl oz
10. RTU-PCNB 14.5 fl oz
11. Allegiance FL 1.5 fl oz
12. Untreated

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Land preparation: rip and strip till into wheat cover crop
4. Planting date and variety: 5 May, DP 1044 B2RF
5. Soil fertility report (Jan 2014):

pH	6.3	Mn	1.5 ppm
Ca.....	594 ppm	Cu	0.3 ppm
Mg.....	48 ppm	Fe.....	14.7 ppm
P	59 ppm	B	0.1 ppm
K	89 ppm		
Zn.....	0.4 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide Pre-emergence – Cotoran 4L 1.0 qt + Prowl 1.0/A (8 May)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (27 May, 4 Jun)
7. Fertilization: ENC 1.0 qt/A (27 May, 6 Jun)
8. Insecticide: Orthene 75S 6 oz/A (27 May, 4 Jun)
   Belt 2 fl oz + Baythroid XL 2 oz/A (14 Aug)
9. Growth regulator: Pentia 6 fl oz/A (26 Jun); 8 oz/A (14 Jul)
10. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (6 Oct)
11. Harvest date: 21 Oct

Table 19. Effect of seed treatments on emergence and yield in cotton.

Treatment and rate/cwt seed (unless otherwise indicated)[1]	**Plants/ft[2] (4 Jun)**	**Yield[3]**	
		lb/A	**bales/A**
Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz	3.3	4438	3.9
Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz	3.0	4471	3.9
Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Prime 0.32 fl oz + Evergol Energy 2.0 fl oz	3.0	4619	4.0
Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed	3.4	4477	3.9
Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed + A9625C 1.0 g ai+ A16148C 7.5 g ai + A9382A 11.0 g ai/100 kg seed	3.0	4477	3.9
Apron XL 3LS 7.5 g ai + Maxim 4FS 2.5 g ai + Systhane 40WP 21.0 g ai/100 kg seed + Dynasty CST 125FS 0.03 mg ai/seed + A9625C 1.0 g ai+ A16148C 10.0 g ai + A9382A 11.0 g ai/100 kg seed	3.0	4662	4.1
Vortex FL 0.08 fl oz + Allegiance FL 0.75 fl oz + Spera 1.8 fl oz + Evergol Extend 0.32 fl oz + Rizolex 1.5 fl oz	3.1	4556	4.0
RTU Baytan/Thiram 3.0 fl oz + Allegiance FL 0.75 fl oz	3.1	4474	3.9
Vitavax-PCNB 6.0 fl oz + Allegiance FL 0.75 fl oz	3.0	4462	3.9
RTU-PCNB 14.5 fl oz	2.8	4414	3.9
Allegiance FL 1.5 fl oz	2.7	4377	3.8
Untreated	3.1	4631	4.0
P(F)	0.16	0.96	0.96

[1] Seed treatments were applied by Dr. Craig Rothrock, Coordinator of National Cottonseed Treatment Trials at the University of Arkansas. Seed was planted 5 May.
[2] Determined from counts of two, 30-ft rows per plot.
[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 41.9% of weight and 480 lb/bale. Plots were harvested on 21 Oct.

VIII. COTTON FOUNDATION SEEDLING DISEASE COMMITTEE - COTTON SEED TREATMENT FUNGICIDE TEST (COTSEEDFUN214, TAREC Research Farm, Field 9B)

A. PURPOSE: To evaluate seed treatment fungicides and pre-emergence herbicide in control of pre- and post-emergence damping-off of cotton when pre-emergence herbicides are used

B. EXPERIMENTAL DESIGN:
1. Split-plot design with main plots of eight rows with and without pre-emergence herbicide
2. Subplots of seed treatments in two 30-ft rows per plot
3. Seeding rate of 3.5 seed/ft of row
4. Four replications in randomized complete block design separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: Seed treatments (S) were applied by personnel with Bayer CropScience. Pre-emergence herbicide treatment applied 8 May.

D. PRE-EMERGENCE HERBICIDE AND RATE/A:
1. Untreated
2. Prowl H_2O 1.0 pt + Cotoran 4L 1.0 qt

E. TREATMENT AND RATE/CWT SEED (unless otherwise indicated):
1. Gaucho 600FS 0.375 mg ai/seed
2. Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz/cwt
3. Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz/cwt + Evergol Extend 0.5 fl oz/cwt
4. Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz/cwt + Evergol Extend 0.5 fl oz/cwt + Aeris Seed Applied System 0.75 mg ai/seed

F. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Land preparation: rip and strip till into wheat cover crop
4. Planting date: 6 May
5. Soil fertility report (Jan 2014):

pH	6.3	Mn	1.5 ppm
Ca.....	594 ppm	Cu	0.3 ppm
Mg.....	48 ppm	Fe.....	14.7 ppm
P	59 ppm	B	0.1 ppm
K	89 ppm		
Zn.....	0.4 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide Post-emergence – Roundup WeatherMax 22 fl oz/A (27 May, 4 Jun)
7. Fertilization: ENC 1.0 qt/A (27 May, 6 Jun)
8. Insecticide: Orthene 75S 6 oz/A (27 May, 4 Jun)
   Belt 2 fl oz + Baythroid XL 2 oz/A (14 Aug)
9. Growth regulator: Pentia 6 fl oz/A (26 Jun); 8 oz/A (14 Jul)
10. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (6 Oct)
11. Harvest date: 21 Oct

Table 20. Effect of pre-emergence herbicide on plant disease and growth of cotton

Herbicide and rate/A	Hypocotyl disease[1] (21 May)	Root disease[2] (21 May)	Biomass (g)[3] (21 May)		
			whole plant	tops	roots
No pre-emergence herbicide	1.9	1.4	16.6	13.8	2.9
Prowl H_2O 1.0 pt + Cotoran 4L 1.0 qt	1.8	1.6	13.8	11.1	2.7
P(F)	0.59	0.09	0.07	0.08	0.13

[1] Hypocotyl disease index: 1=none, 2=pinpoint lesions, 3=distinct necrotic lesion, 4=girdling lesions, 5=dead.
[2] Root disease index: 1=none, 2=1-10%, 3=11-25%, 4=26-50%, 5=51-75%, 6=76-100% discolored.
[3] Data are mean of ten, randomly selected plants per each destructive sample check plot.

Table 21. Effect of pre-emergence herbicide and seed treatment on emergence, vigor, and growth of cotton.

Herbicide and rate/A, seed treatment and rate/cwt seed (unless otherwise indicated)[1]	Plants/ft[2]		% vigor[3]		No. of skips[4] (20 May)	Skip index[5] (20 May)
	20 May	3 Jun	20 May	3 Jun		
***Split-plot analysis, P*(F)**						
Herbicide	0.61	0.96	0.95	0.31	0.08	0.39
Seed treatment	**0.002**	**0.003**	0.13	0.09	**0.05**	**0.03**
Herbicide × seed treatment	0.49	0.41	0.35	0.95	0.98	0.84
Seed treatment mean						
Gaucho 600FS 0.375 mg ai/seed	1.7 b	1.7 b	90.5	91.9	12.8 a	24.0 a
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz	2.1 a	2.1 a	87.1	96.8	9.0 b	14.0 b
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz	2.1 a	2.1 a	91.5	95.4	8.3 b	12.3 b
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz + Aeris Seed Applied System 0.75 mg ai/seed	2.2 a	2.2 a	92.0	97.5	9.5 ab	14.8 b
Herbicide mean						
No pre-emergence herbicide	2.0	2.0	90.4	95.9	8.6	14.4
Prowl H_2O 1.0 pt + Cotoran 4L 1.0 qt	2.0	2.0	90.2	94.8	11.1	18.1

[1] All seed were treated by personnel with Bayer CropScience.
[2] Determined from counts of two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
[4] Determined from counts in two, 30-ft rows per plot.
[5] Length and number of skips were recorded to calculate a skip index. Skips were counted and reported according to previous methods (Colyer and Vernon, 2005). The skip index was the sum of skips within each of the two, 30-ft rows/plot. Skips were assigned as 0=no skips, 1=skips 12 to 18 in., 2=skips 18-24 in., 3=skips 24-36 in. and 4=skips >36 in.
Means within a column and group followed by the same letter(s) are not significantly different at *P*=0.05 according to Fisher's Protected LSD.

Table 22. Effect of pre-emergence herbicide and seed treatment on growth, flowering, earliness and yield of cotton.

Herbicide and rate/A, seed treatment and rate/cwt seed (unless otherwise indicated)[1]	Seedling height[2] (20 May)	Plant hgt. (in.)[3] (11 Jul)	Flowers/ 12 ft[4] (15 Jul)	Open bolls[4] (16 Sep)	Yield[5]	
					lb/A	bales/A
No pre-emergence herbicide						
Gaucho 600FS 0.375 mg ai/seed	3.8 a	28.0 ab	29.8 ab	100.3 a	4574	3.9
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz	3.6 a	28.5 a	32.5 a	78.3 b	5282	4.5
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz	3.7 a	27.5 bc	32.5 a	79.3 b	4913	4.2
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz + Aeris Seed Applied System 0.75 mg ai/seed	2.8 b	27.1 c	26.8 b	78.3 b	4985	4.3
Prowl H_2O 1.0 pt + Cotoran 4L 1.0 qt						
Gaucho 600FS 0.375 mg ai/seed	3.4 b	27.9 a	26.3 a	71.5 a	4625	4.0
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz	3.7 a	26.8 b	29.5 a	81.0 a	4674	4.0
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz	3.5 ab	28.7 a	28.3 a	75.0 a	5061	4.4
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz + Aeris Seed Applied System 0.75 mg ai/seed	3.6 a	28.2 a	28.3 a	67.8 a	5130	4.4
***Split-plot analysis, P*(F)**						
Herbicide	0.80	0.92	0.25	0.09	0.70	0.70
Seed treatment	**0.0009**	0.42	**0.04**	0.12	0.19	0.19
Herbicide x seed treatment	**0.0001**	**0.0001**	0.16	**0.04**	0.28	0.28
Seed treatment mean						
Gaucho 600FS 0.375 mg ai/seed	3.6 a	27.9	28.0 bc	85.9	4600	4.0
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz	3.7 a	27.7	31.0 a	79.6	4978	4.3
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz	3.6 a	28.1	30.4 ab	77.1	4987	4.3
Gaucho 600FS 0.375 mg ai/seed + Spera 1.8 fl oz + Vortex 0.08 fl oz + Allegiance FL 0.75 fl oz + Evergol Prime 0.32 fl oz + Evergol Extend 0.5 fl oz + Aeris Seed Applied System 0.75 mg ai/seed	3.2 b	27.7	27.5 c	73.0	5058	4.4
Herbicide mean						
No pre-emergence herbicide	3.5	27.8	30.4	84.0	4938	4.2
Prowl H_2O 1.0 pt + Cotoran 4L 1.0 qt	3.6	27.9	28.1	73.8	4873	4.2

[1]All seed were treated by personnel with Bayer CropScience. [2]Measurements of ten, randomly selected plants in each plot. [3]Measurements of three, randomly selected plants in each plot. [4]Determined from counts in a 6-ft section of each row per plot. [5]Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 41.3% of weight and 480 lb/bale. Plots were harvested on 21 Oct. Means within a column and group followed by the same letter(s) are not significantly different at P=0.05 according to Fisher's Protected LSD.

IX. COTTON SEED TREATMENT FUNGICIDE TEST (COTSEEDFUN314, TAREC Research Farm, Field 9B)

A. PURPOSE: To evaluate seed treatment fungicides for control of early season diseases in cotton.

B. EXPERIMENTAL DESIGN:
1. Main plots of four, 30-ft rows spaced 36 in. apart
2. Subplots of two rows with and without Rhizoctonia inoculum in seed furrow
3. Four randomized complete blocks separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: Seed (S) and overcoat (O) treatments were applied by Syngenta Crop Protection.

D. TREATMENT AND RATE (a.i.):
1. Cruiser 5FS 0.375 mg/seed (S)
2. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)
3. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed (O)
4. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed (O)
5. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed (O)
6. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)
7. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)
8. Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)
9. STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)
10. STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)

E. INOCULUM: (Sub-plots) Inoculum was prepared in the Plant Pathology Lab at the Tidewater AREC using seed of white millet moistened with a 2:1 ratio of seed to distilled water and autoclaved twice. The seed was then inoculated with *Rhizoctonia solani* that was isolated from peanut and allowed to incubate at room temperature for 10 days. Subsequently, seed was dried at room temperature for 4 days and then screened to ensure uniform size. Inoculum was applied to the seed furrow at 0.35 ml/ft of row.
1. Non-inoculated
2. Inoculated (Millet seed infested with *Rhizoctonia solani*)

F. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Land preparation: rip and strip till into wheat cover crop
4. Planting date: 6 May, DP0949 B2RF

5. Soil fertility report (Jan 2014):

pH	6.3	K.....	89 ppm
Ca.....	594 ppm	Zn	0.4 ppm
Mg.....	48 ppm	Mn	1.5 ppm
P	59 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide:
   Pre-emergence – Prowl H_20 1.0 pt + Cotoran 1.0 qt/A (8 May)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (27 May, 4 Jun)
7. Fertilization: Ele-max ENC 1.0 qt/A (27 May, 6 Jun)
   Liquid nitrogen 24-0-0-3 40 units/A (20 Jun, 27 Jun)
8. Insecticide: Orthene 75S 6 oz/A (27 May, 4 Jun)
   Belt 2 fl oz + Baythroid XL 2 oz/A (14 Aug)
9. Growth regulator: Pentia 6 fl oz/A (26 Jun); 8 oz/A (14 Jul)
10. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (6 Oct)
11. Harvest date: 21 Oct

Table 23. Effect of seed treatment on emergence of cotton.

Treatment and rate (a.i.)[1]	Plants/ft[2]		
	20 May	**3 Jun**	**18 Jun**
***Split-plot analysis, P*(F)**			
Treatment	0.30	0.35	0.34
Inoculum	0.32	0.56	0.64
Treatment × inoculum	0.55	0.22	0.42
Treatment mean			
Cruiser 5FS 0.375 mg/seed (S)	2.4	2.1	2.2
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	2.3	2.0	2.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	2.3	2.0	2.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	2.7	2.4	2.5
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	2.5	2.1	2.2
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	2.5	2.2	2.3
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	2.3	1.8	1.9
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	2.4	2.1	2.2
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	2.4	2.1	2.1
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	2.2	1.9	1.9
Inoculum mean			
Non-inoculated	2.4	2.1	2.2
Inoculated	2.4	2.1	2.1

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.
[2] Determined from counts of two, 30-ft rows per plot.

Table 24. Effect of seed treatment on plant growth of cotton.

Treatment and rate (a.i.)[1]	% vigor[2]		
	20 May	**3 Jun**	**18 Jun**
***Split-plot analysis, P*(F)**			
Treatment	0.73	0.95	0.75
Inoculum	**0.0009**	0.98	0.87
Treatment x inoculum	0.11	0.32	0.24
Treatment mean			
Cruiser 5FS 0.375 mg/seed (S)	87.5	96.8	98.3
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	87.5	93.5	91.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	85.0	96.4	96.6
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	91.9	96.0	96.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	88.8	95.6	97.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	88.8	97.9	98.3
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	88.1	96.5	97.9
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	90.6	97.9	94.8
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	88.1	97.3	98.9
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	88.1	97.0	97.5
Inoculum mean			
Non-inoculated	90.3 a	96.5	96.6
Inoculated	86.6 b	96.5	96.9

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.

[2] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 25. Effect of seed treatment on seedling disease of cotton.

Treatment and rate (a.i.)[1]	Hypo. (1-5)[2] (22 May)	Root disease incid.[3] (22 May)	Root disease % sev.[4] (22 May)
***Split-plot analysis, P*(F)**			
Treatment	0.52	0.47	0.81
Inoculum	0.51	0.86	0.26
Treatment × inoculum	0.70	0.65	0.19
Treatment mean			
Cruiser 5FS 0.375 mg/seed (S)	2.2	0.7	8.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	2.4	0.9	8.7
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	2.0	0.8	8.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	2.2	0.8	9.5
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	2.5	0.8	9.6
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	2.0	0.7	9.2
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	2.3	0.8	8.4
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	2.3	0.8	7.1
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	2.1	0.8	11.1
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	2.3	0.7	7.6
Inoculum mean			
Non-inoculated	2.2	0.8	8.3
Inoculated	2.2	0.8	9.2

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.
[2] Hypocotyl rating scale: 1 = no disease, 2 = a few necrotic spots, 3 = distinct necrotic lesions, 4 = lesion girdling stem, 5 = seedling dead/dying.
[3] Root disease incidence: 0=no disease, 1=disease present (necrosis, root rot).
[4] Root disease severity: % root system necrotic (0-100%).

Table 26. Effect of seed treatment on growth and flowering of cotton.

Treatment and rate (a.i.)[1]	Plant ht. (in.)[2] (11 Jul)		No. flowers/12 ft[3] (15 Jul)	
	Non	Inoc	Non	Inoc
Cruiser 5FS 0.375 mg/seed (S)	27.4 ab	27.2 ab	31.0	28.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	27.1 bc	26.9 b-d	30.0	33.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	25.8 de	26.4 b-d	28.0	31.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	28.2 a	28.1 a	31.5	30.5
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	27.3 a-c	27.3 ab	27.8	30.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	26.0 d	27.0 b-d	36.5	30.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	25.7 de	27.1 bc	30.3	29.5
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	26.5 cd	26.1 d	34.3	33.0
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	26.4 cd	26.9 b-d	31.3	31.0
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	25.0 e	26.2 cd	31.5	26.3
***Split-plot analysis, P*(F)**				
Treatment	0.06		0.81	
Inoculum	**0.003**		0.57	
Treatment × inoculum	**0.008**		0.79	
Treatment mean				
Cruiser 5FS 0.375 mg/seed (S)	27.3		29.9	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	27.0		31.9	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	26.1		29.5	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	28.1		31.0	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	27.3		28.9	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	26.5		33.6	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	26.4		29.9	
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	26.3		33.6	
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	26.6		31.1	
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	25.6		28.9	
Inoculum mean				
Non-inoculated	26.5 b		31.2	
Inoculated	26.9 a		30.5	

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.

[2] Measurements of three, randomly selected plants in each row per plot.

[3] Determined from counts in two, 6-ft. sections of row per plot.

Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 27. Effect of seed treatment on earliness of cotton.

Treatment and rate (a.i.)[1]	**No. open bolls/12 ft**[2] **(16 Sep)**
***Split-plot analysis, P*(F)**	
Treatment	0.40
Inoculum	0.68
Treatment × inoculum	0.64
Treatment mean	
Cruiser 5FS 0.375 mg/seed (S)	91.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	95.5
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	83.4
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	91.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	89.1
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	88.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	87.9
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	103.9
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	93.5
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	82.1
Inoculum mean	
Non-inoculated	90.0
Inoculated	91.2

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.

[2] Determined from counts in two, 6-ft. sections of row per plot.

Table 28. Effect of seed treatment on yield of cotton.

Treatment and rate (a.i.)[1]	Yield[2]	
	lb/A	bales/A
***Split-plot analysis, P*(F)**		
Treatment	0.65	0.65
Inoculum	0.23	0.89
Treatment x inoculum	0.91	0.91
Treatment mean		
Cruiser 5FS 0.375 mg/seed (S)	4474	3.9
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	4299	3.7
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A13012 0.03 mg (S)+ Cruiser 5FS 0.375 mg/seed (O)	4359	3.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 6.52 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	4482	3.9
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A16148 9.13 g/100 kg seed + A13012 0.03 mg + Cruiser 5FS 0.375 mg/seed	4559	4.0
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21203 0.04 mg + Cruiser 5FS 0.375 mg/seed (O)	4436	3.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21204 0.042 mg + Cruiser 5FS 0.375 mg/seed (O)	4345	3.8
Apron XL 3LS 7.5 g + Maxim 4FS 2.5 g + Systhane 40WP 21 g/100 kg seed (S) + A21205 0.041 mg + Cruiser 5FS 0.375 mg/seed (O)	4221	3.7
STP15142 FS 15 g + STP15199 FS 10 g + STP17141 FS 40 g + A17823 FS 21 g/100 kg seed (S) + Cruiser 5FS 0.375 mg/seed (O)	4411	3.8
STP15101 FS 2.35 g + STP15142 FS 15.25 g + A17823 FS 28.25 g + A20451 FS 5 g + STP10182 9 g/100 kg seed (S)+ Cruiser 5FS 0.375 mg/seed	4327	3.8
Inoculum mean		
Non-inoculated	4350	3.8
Inoculated	4433	3.8

[1] S = seed treatment. O = overcoat treatment on top of base seed treatment.

[2] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 42.0% of weight for non-inoculated cotton, 41.3% of weight for inoculated cotton, and 480 lb/bale. Plots were harvested on 21 Oct.

X. EVALUATION OF IN-FURROW BIOLOGICAL APPLICATION IN COTTON FOR SEEDLING DISEASE CONTROL (COTBIO114, TAREC Research Farm, Field 9B)

A. PURPOSE: To evaluate in-furrow biological treatment for control of seedling disease in cotton.

B. EXPERIMENTAL DESIGN:
1. Main plots of four, 30-ft rows spaced 36 in. apart
2. Subplots of two rows with and without Rhizoctonia inoculum in seed furrow
3. Four randomized complete blocks separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: Granular in-furrow biological (F) applied to the seed furrow at planting using a Noble box.

D. INOCULUM: (Sub-plots) Inoculum was prepared in the Plant Pathology Lab at the Tidewater AREC using seed of white millet moistened with a 2:1 ratio of seed to distilled water and autoclaved twice. The seed was then inoculated with *Rhizoctonia solani* that was isolated from peanut and allowed to incubate at room temperature for 10 days. Subsequently, seed was dried at room temperature for 4 days and then screened to ensure uniform size. Inoculum was applied in an 8 inch band in front of rolling cultivator at 0.5 ml/ft.
1. Non-inoculated
2. Inoculated (Millet seed infested with *Rhizoctonia solani*)

E. TREATMENT AND RATE/A:
1. Untreated
2. Burkholderia 10 lb (F)

F. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Planting date and variety: 9 May, ST5458 B2RF
4. Soil fertility report (Jan 2014):

pH	6.3	K.....	89 ppm
Ca.....	594 ppm	Zn	0.4 ppm
Mg.....	48 ppm	Mn	1.5 ppm
P	59 ppm	Soil type	Kenansville loamy fine sand

5. Herbicide:
   Pre-emergence – Prowl H_20 1.0 pt + Cotoran 1.0 qt/A (8 May)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (27 May, 4 Jun)
6. Fertilization: Ele-max ENC 1.0 qt/A (27 May, 6 Jun)
7. Insecticide: Orthene 75S 6 oz/A (27 May, 4 Jun)
   Belt 2 fl oz + Baythroid XL 2 oz/A (14 Aug)
8. Growth regulator: Pentia 6 fl oz/A (26 Jun); 8 oz/A (14 Jul)
9. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (6 Oct)
10. Harvest date: 21 Oct

Table 29. Effect of treatments on seedling disease of cotton, 4 Jun.

Treatment and rate/A[1]	Hypocotyl rating[2]	Root disease % severity[3]	% roots with Fusarium[4]	% roots with Rhizoctonia[4]
Non-inoculated				
Untreated	2.8	6.0	12.5	59.4 b
Burkholderia 10 lb/A (F)	2.7	5.8	3.1	81.3 a
Inoculated				
Untreated	2.6	6.0	9.4	62.5 a
Burkholderia 10 lb/A (F)	2.7	5.5	15.6	46.9 b
***Split-plot analysis, P*(F)**				
Treatment	0.50	0.77	0.81	0.66
Inoculum	0.27	0.77	0.52	**0.02**
Treatment x inoculum	0.37	0.83	0.30	**0.009**
Inoculum mean				
Non-inoculated	2.8	5.9	7.8	70.3 a
Inoculated	2.6	5.7	12.5	54.7 b
Treatment mean				
Untreated	2.7	6.0	10.9	60.9
Burkholderia 10 lb/A (F)	2.7	5.7	9.4	64.1

[1] F = in-furrow.
[2] Hypocotyl rating scale: 1=no disease, 2=a few necrotic spots, 3=distinct necrotic lesions, 4=lesion girdling stem, 5=seedling dead/dying.
[3] Root disease severity: % root system necrotic (0-100%).
[4] Roots from 8 plants per treatment were plated on 1.5% water agar.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 30. Effect of treatments on emergence and plant health of cotton.

Treatment and rate/A[1]	Plants/ft[2]			% vigor[3]		
	23 May	4 Jun	20 Jun	23 May	4 Jun	20 Jun
Non-inoculated						
Untreated	2.9 a	2.9 a	2.8 a	93.3	95.0	96.3
Burkholderia 10 lb/A (F)	2.7 a	2.6 b	2.7 a	97.0	95.0	100.0
Inoculated						
Untreated	2.6 b	2.5 b	2.5 b	96.3	95.0	100.0
Burkholderia 10 lb/A (F)	2.9 a	2.7 a	2.8 a	94.5	92.5	97.3
***Split-plot analysis, P*(F)**						
Treatment	0.33	.16	.57	.83	.60	.64
Inoculum	0.36	.34	.35	.82	.67	.57
Treatment x inoculum	**0.02**	**0.03**	**0.02**	**0.04**	0.67	**0.008**
Inoculum mean						
Non-inoculated	2.8	2.7	2.7	95.1	95.0	98.1
Inoculated	2.7	2.6	2.7	95.4	93.8	98.6
Treatment mean						
Untreated	2.7	2.7	2.6	94.8	95.0	98.1
Burkholderia 10 lb/A (F)	2.8	2.7	2.7	95.8	93.8	98.6

[1] F = in-furrow.
[2] Determined from counts in two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 31. Effect of seed treatments on growth, flowering, and earliness of cotton.

Treatment and rate/A[1]	**Plant height (in.)[2] (11 Jul)**	**Flowers/12 ft[3] (14 Jul)**	**Open bolls/12 ft[3] (16 Sep)**
Non-inoculated			
Untreated	22.5 b	19.5	38.5
Burkholderia 10 lb/A (F)	23.2 a	20.5	36.0
Inoculated			
Untreated	23.5 a	25.0	36.0
Burkholderia 10 lb/A (F)	22.1 b	22.3	37.0
***Split-plot analysis, P*(F)**			
Treatment	0.55	0.84	0.93
Inoculum	0.71	0.07	0.85
Treatment x inoculum	**0.0001**	0.29	0.67
Inoculum mean			
Non-inoculated	22.9	20.0	37.3
Inoculated	22.8	23.6	36.5
Treatment mean			
Untreated	23.0	22.3	37.3
Burkholderia 10 lb/A (F)	22.7	21.4	36.5

[1] F = in-furrow.
[2] Measurements of three, randomly selected plants in each plot.
[3] Determined from counts in a 6-ft section of each row per plot.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 32. Effect of treatments on yield of cotton.

Treatment and rate/A[1]	Yield[2]	
	lb/A	bales/A
***Split-plot analysis, P*(F)**		
Treatment	0.82	0.82
Inoculum	0.57	0.57
Treatment x inoculum	0.34	0.34
Inoculum mean		
Non-inoculated	4477	3.9
Inoculated	4368	3.8
Treatment mean		
Untreated	4404	3.8
Burkholderia 10 lb/A (F)	4441	3.9

[1] F = in-furrow.

[2] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 41.8% of weight and 480 lb/bale. Plots were harvested on 21 Oct.

XI. EVALUATION OF ROOT KNOT NEMATODE RESISTANCE IN COTTON VARIETIES (COTVARNEMA114, Morgan Farm, Suffolk)

A. PURPOSE: To evaluate cotton varieties for resistance/tolerance to southern root-knot nematode.

B. EXPERIMENTAL DESIGN:
1. Split-plot design with four randomized complete blocks separated by 8-ft alleyways
2. Main plots of varieties and treatments in subplots
3. Two, 30-ft rows per subplot at 36-in. row spacing and seeding rate of three seed/ft of row

C. APPLICATION OF TREATMENTS: (F) Granular treatments were applied to the seed furrow with a Noble Box at planting.

D. VARIETY
1. DG2285 B2RF
2. DP1028 B2RF
3. FM1944 GLB2
4. NG1511 B2RF
5. DP1454 B2RF
6. PHY333 WRF
7. PHY339 WRF
8. PHY427 WRF
9. PHY499 WRF
10. ST4946 GLB2
11. ST5458 B2RF

E. TREATMENT:
1. Untreated
2. Temik 15G 5 lb/A (F)

F. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: Continuous cotton since 2000
3. Land preparation: disk in early spring followed by rip and strip till rows
4. Planting date: 12 May
5. Soil fertility report (Jan 2014):

pH	6.3	Mn	1.5 ppm
Ca.....	594 ppm	Cu	0.3 ppm
Mg.....	48 ppm	Fe.....	14.7 ppm
P	59 ppm	B	0.1 ppm
K	89 ppm		
Zn.....	0.4 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide: Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun)
7. Fertilization: 7-0-40 300 lb/A (14 Apr)
ENC 1.0 qt/A (6 Jun, 2 Jul)
24% Nitrogen 81.6 units (23 Jun)
8. Insecticide: Orthene 97S 6 oz/A (6 Jun)
Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
9. Growth regulator: Pentia 16 fl oz/A (14 Jul)

10. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz + Dropp 2 fl oz/A (17 Oct)
11. Harvest date: 4 Nov

Table 33. Nematode populations at planting in cotton.

	Nematodes/500 cc soil (13 May)[1]						
Variety	**Root knot juvenile**	**Cyst**	**Lesion**	**Stunt**	**Spiral**	**Lance**	**Stubby root**
DG2285 B2RF	70	0	10	80	260	10	90
DP1028 B2RF	45	0	55	135	125	20	100
FM1944 GLB2	95	5	20	115	110	5	190
NG1511 B2RF	100	5	15	165	170	45	225
DP1454 B2RF	125	0	20	110	170	30	90
PHY333 WRF	85	0	10	140	160	20	360
PHY339 WRF	180	0	10	95	960	170	100
PHY427 WRF	55	0	35	90	505	35	120
PHY499 WRF	85	5	35	110	200	0	150
ST4946 GLB2	50	25	40	90	215	35	160
ST5458 B2RF	70	0	30	160	305	15	145
P(F)	.62	.59	.67	.96	.85	.73	.07

[1] Soil was sampled on 13 May. Data are counts of nematodes in a composite sample taken each main plot prior to planting. Square root transformation of population data was made in analysis to determine statistical significance.

Table 34. Effect of variety selection and fungicide treatment on emergence, plant health, growth, and flowering of cotton.

Variety, treatment and rate/A[1]	Plants/ft[2] (11 Jun)	% vigor[3] (11 Jun)	Plant height (in.)[4] (22 Jul)	Flowers/12 ft[5] (22 Jul)
DG2285 B2RF				
Untreated	2.1	91.3 b	31.0 b	24.8
Temik 15G 5 lb/A (F)	2.2	100.0 a	34.5 a	31.5
P(F)	0.52	**0.04**	**0.0001**	0.08
DP1028				
Untreated	1.7 b	62.5 b	27.3 b	4.5
Temik 15G 5 lb/A (F)	2.3 a	100.0 a	33.3 a	14.3
P(F)	**0.03**	**0.04**	**0.0001**	0.09
FM1944 GLB2				
Untreated	2.4	91.3	28.6 b	16.0
Temik 15G 5 lb/A (F)	2.7	100.0	31.8 a	22.5
P(F)	0.08	0.13	**0.0001**	0.12
NG1511 B2RF				
Untreated	2.2	93.8 b	31.4 b	24.5 b
Temik 15G 5 lb/A (F)	2.3	100.0 a	35.2 a	34.8 a
P(F)	0.43	**0.02**	**0.0001**	0.05
DP1454 B2RF				
Untreated	2.2	94.0	32.9 b	5.5
Temik 15G 5 lb/A (F)	2.1	98.8	34.0 a	9.0
P(F)	0.58	0.34	**0.01**	0.38
PHY333 WRF				
Untreated	2.7	95.8	32.8 b	28.0
Temik 15G 5 lb/A (F)	2.9	100.0	35.9 a	40.5
P(F)	0.26	0.32	**0.0001**	0.08
PHY339 WRF				
Untreated	2.6	88.8 b	32.5 b	20.3
Temik 15G 5 lb/A (F)	2.6	100.0 a	35.8 a	25.5
P(F)	0.86	**0.003**	**0.0001**	0.22
PHY427 WRF				
Untreated	3.0	98.3	34.3	15.5
Temik 15G 5 lb/A (F)	3.0	99.5	34.8	25.0
P(F)	0.84	0.46	0.20	0.07
PHY499 WRF				
Untreated	2.7	93.8	32.5 b	8.5 b
Temik 15G 5 lb/A (F)	2.9	100.0	34.9 a	18.8 a
P(F)	0.43	0.14	**0.0001**	**0.02**
ST4946 GLB2				
Untreated	2.0	88.8	30.8 b	19.0
Temik 15G 5 lb/A (F)	2.2	100.0	32.3 a	19.8
P(F)	0.20	0.06	**0.0001**	0.65
ST5458 BRF				
Untreated	2.0	98.3	29.4 b	16.5 b
Temik 15G 5 lb/A (F)	2.0	100.0	31.5 a	21.3 a
P(F)	0.73	0.24	**0.0001**	**0.05**

[1]F = in-furrow (12 May). [2]Determined from counts of two, 30-ft rows per plot. [3]Percent vigor relative to the treatment in each replicate with the greatest vigor level. [4]Measurements of three, randomly selected plants in each plot. [5]Determined from counts in a 6-ft section of each row per plot. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 34 (cont.). Effect of variety selection and fungicide treatment on emergence, plant health, growth, and flowering of cotton.

Variety, treatment and rate/A[1]	Plants/ft[2] (11 Jun)	% vigor[3] (11 Jun)	Plant height (in.)[4] (22 Jul)	Flowers/12 ft[5] (22 Jul)
***Split-plot analysis, P*(F)**				
Variety	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Treatment	**0.004**	**0.0001**	**0.0001**	**0.0001**
Variety x treatment	0.06	**0.0001**	**0.0001**	0.29
Variety mean				
DG2285 B2RF	2.2 de	95.6	32.8	28.1 b
DP1028 B2RF	2.0 e	81.3	30.3	9.4 de
FM1944 GLB2	2.6 c	95.6	30.2	19.3 c
NG1511 B2RF	2.3 d	96.9	33.3	29.6 b
DP1454 B2RF	2.1 de	96.4	33.4	7.3 e
PHY333 WRF	2.8 b	97.9	34.4	34.3 a
PHY339 WRF	2.6 bc	94.4	34.2	22.9 c
PHY427 WRF	3.0 a	98.9	34.6	20.3 c
PHY499 WRF	2.8 ab	96.9	33.7	13.6 d
ST4946 GLB2	2.1 de	94.4	31.6	19.4 c
ST5458 B2RF	2.0 e	99.1	30.5	18.9 c
Treatment mean				
Untreated	2.3 b	90.6	31.2	16.6 b
Temik 15G 5 lb/A (F)	2.5 a	99.8	34.0	23.9 a

[1] F = in-furrow (12 May).
[2] Determined from counts of two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
[4] Measurements of three, randomly selected plants in each plot.
[5] Determined from counts in a 6-ft section of each row per plot.
Means within in a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 35. Effect of variety selection and fungicide treatment on nematode populations in cotton.

Variety, treatment and rate/A[1]	Nematodes/500 cc soil (12 Aug)[2]						
	Root knot juvenile	Cyst	Lesion	Stunt	Spiral	Lance	Stubby root
DG2285 B2RF							
Untreated	460	5	5	195	575	5	175
Temik 15G 5 lb/A (F)	725	0	5	150	895	25	150
P(F)	0.46	0.39	1.0	0.40	0.44	0.28	0.90
DP1028							
Untreated	390	0	15	50	395	55	270
Temik 15G 5 lb/A (F)	215	5	10	100	1340	0	330
P(F)	0.13	0.39	0.91	0.05	0.44	0.20	0.19
FM1944 GLB2							
Untreated	840	30	25	120	580	15	445
Temik 15G 5 lb/A (F)	790	0	40	125	620	5	445
P(F)	0.93	0.19	0.83	0.47	0.98	0.39	0.56
NG1511 B2RF							
Untreated	425	0	20	155	785	10	355
Temik 15G 5 lb/A (F)	365	120	35	180	515	20	265
P(F)	0.93	0.16	0.39	0.24	0.41	0.39	0.14
DP1454 B2RF							
Untreated	270	0	35	160	475	5	395
Temik 15G 5 lb/A (F)	185	5	35	135	585	60	165
P(F)	0.49	0.39	0.92	0.37	0.63	0.39	0.39
PHY333 WRF							
Untreated	220	25	15	105	530	20	290
Temik 15G 5 lb/A (F)	528	20	5	70	595	0	270
P(F)	0.17	0.85	0.77	0.97	0.60	0.39	0.77
PHY339 WRF							
Untreated	1160	55	30	475	1170	65	160
Temik 15G 5 lb/A (F)	760	35	5	60	795	30	115
P(F)	0.95	0.93	0.19	0.54	0.90	0.96	0.43
PHY427 WRF							
Untreated	185	10	35	155	1375	15	240
Temik 15G 5 lb/A (F)	155	5	35	55	1460	100	265
P(F)	0.21	0.85	0.73	0.07	0.84	0.20	0.95
PHY499 WRF							
Untreated	710	35	30	30	1180	0	290
Temik 15G 5 lb/A (F)	1135	40	55	115	1572	10	380
P(F)	0.17	0.39	0.78	0.19	0.08	0.39	0.36
ST4946 GLB2							
Untreated	690	40	80	65	245	25	285
Temik 15G 5 lb/A (F)	380	15	35	130	525	0	225
P(F)	0.53	0.85	0.39	0.23	0.25	0.22	0.85
ST5458 BRF							
Untreated	365	5	10	80	560	5	475
Temik 15G 5 lb/A (F)	160	20	35	70	805	0	310
P(F)	0.69	0.72	0.79	0.75	0.77	0.39	0.08

[1] (F) = in-furrow (12 May). [2]Soil was sampled on 12 Aug. Data are the mean counts of nematodes in a sample from four reps of each treatment/variety combination. Square root transformation of population data was made in analysis to determine statistical significance. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 35 (cont.). Effect of variety selection and fungicide treatment on nematode populations in cotton.

Variety, treatment and rate/A[1]	Nematodes/500 cc soil (12 Aug)[2]						
	Root knot juvenile	Cyst	Lesion	Stunt	Spiral	Lance	Stubby root
***Split-plot analysis, P*(F)**							
Variety	0.05	0.84	0.60	0.96	0.17	0.87	0.60
Treatment	0.09	0.42	0.70	0.97	0.13	0.79	0.22
Variety x treatment	0.64	0.25	0.98	0.54	0.97	0.15	0.84
Variety mean							
DG2285 B2RF	598	3	5	173	735	15	163
DP1028 B2RF	303	3	13	75	868	28	300
FM1944 GLB2	815	15	33	123	600	10	445
NG1511 B2RF	395	60	28	168	650	15	310
DP1454 B2RF	228	3	35	148	530	33	280
PHY333 WRF	374	23	10	88	563	10	280
PHY339 WRF	960	45	18	268	983	48	138
PHY427 WRF	170	8	35	105	1418	58	253
PHY499 WRF	923	38	43	73	1376	5	335
ST4946 GLB2	535	28	58	98	385	13	255
ST5458 B2RF	263	13	23	75	683	3	393
Treatment mean							
Untreated	520	19	27	145	716	20	307
Temik 15G 5 lb/A (F)	492	24	27	108	883	23	265

[1] (F) = in-furrow (12 May).

[2] Soil was sampled on 12 Aug. Data are the mean counts of nematodes in a sample from four reps of each treatment/variety combination. Square root transformation of population data was made in analysis to determine statistical significance.

Table 36. Effect of variety selection and fungicide treatment on earliness, root gall and yield of cotton.

Variety, treatment and rate/A[1]	Open bolls[2] (2 Oct)	Root galling[3] (24 Nov)	Yield[4]	
			lb/A	bales/A
DG2285 B2RF				
Untreated	48.0	2.1	3328 b	3.2 b
Temik 15G 5 lb/A (F)	61.5	2.1	4317 a	4.2 a
P(F)	0.21	0.83	**0.02**	**0.02**
DP1028				
Untreated	30.0	2.5a	2692 b	2.7 b
Temik 15G 5 lb/A (F)	43.8	1.5b	4023 a	4.0 a
P(F)	0.13	**0.0001**	**0.009**	**0.006**
FM1944 GLB2				
Untreated	49.5 b	1.8 a	3415 b	3.1 b
Temik 15G 5 lb/A (F)	69.3 a	1.1 b	4525 a	4.1 a
P(F)	**0.03**	**0.002**	**0.04**	**0.02**
NG1511 B2RF				
Untreated	56.3 b	2.7 a	3216	3.2 b
Temik 15G 5 lb/A (F)	70.3 a	1.3 b	4296	4.3 a
P(F)	**0.003**	**0.0001**	**0.06**	**0.05**
DP1454 B2RF				
Untreated	20.3	1.8 a	3328 b	3.0 b
Temik 15G 5 lb/A (F)	27.3	1.1 b	3736 a	3.5 a
P(F)	0.26	**0.0001**	**0.04**	**0.04**
PHY333 WRF				
Untreated	74.8	2.6	3836 b	3.9 b
Temik 15G 5 lb/A (F)	72.8	2.4	4592 a	4.4 a
P(F)	0.77	0.48	**0.007**	**0.05**
PHY339 WRF				
Untreated	56.0 b	3.5 a	3155 b	3.1
Temik 15G 5 lb/A (F)	70.0 a	2.7 b	3815 a	3.7
P(F)	**0.05**	**0.005**	**0.04**	0.08
PHY427 WRF				
Untreated	69.0	1.6 a	4017	3.6 b
Temik 15G 5 lb/A (F)	67.3	0.8 b	4271	4.1 a
P(F)	0.72	**0.0001**	0.13	**0.004**
PHY499 WRF				
Untreated	32.0	2.9 a	3470 b	3.4 b
Temik 15G 5 lb/A (F)	44.3	1.6 b	4259 a	4.2 a
P(F)	0.08	**0.0001**	**0.01**	**0.02**
ST4946 GLB2				
Untreated	45.0	2.0 a	3427 b	3.2 b
Temik 15G 5 lb/A (F)	44.8	1.3 b	4471 a	4.2 a
P(F)	0.96	**0.002**	**0.0002**	**0.002**
ST5458 BRF				
Untreated	37.3	1.8	3633 b	3.4
Temik 15G 5 lb/A (F)	45.8	1.3	4157 a	3.8
P(F)	0.35	0.08	**0.05**	0.10

[1](F) = in-furrow (12 May). [2]Determined from counts in a 6-ft section of each row per plot. [3]Rating scale: 0=none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of root system with galls. Ratings were made on four randomly selected plants per plot. [4]Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint weight (480 lb bale) was determined by ginning samples of seed cotton from each variety. Plots were harvested on 4 Nov. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 36 (cont.). Effect of variety selection and fungicide treatment on earliness, root gall and yield of cotton.

Variety, treatment and rate/A[1]	Open bolls[2] (2 Oct)	Root galling[3] (24 Nov)	Yield[4]	
			lb/A	bales/A
***Split-plot analysis, P*(F)**				
Variety	**0.0001**	**0.0001**	**0.0003**	**0.0003**
Treatment	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Variety x treatment	0.11	**0.002**	**0.03**	**0.04**
Variety mean				
DG2285 B2RF	54.8 d	2.1 c	3822 c	3.7 b
DP1028 B2RF	36.9 e	2.0 c	3358 e	3.4 cd
FM1944 GLB2	59.4 cd	1.4 de	3970 a-c	3.6 bc
NG1511 B2RF	63.3 bc	2.0 c	3756 cd	3.7 b
DP1454 B2RF	23.8 f	1.4 de	3482 de	3.3 d
PHY333 WRF	73.8 a	2.5 b	4214 a	4.2 a
PHY339 WRF	63.0 bc	3.1 a	3485 de	3.4 cd
PHY427 WRF	68.1 ab	1.2 e	4144 ab	3.8 b
PHY499 WRF	38.1 e	2.2 bc	3864 bc	3.8 b
ST4946 GLB2	44.9 e	1.7 d	3949 a-c	3.7 b
ST5458 B2RF	41.5 e	1.5 de	3895 bc	3.6 bc
Treatment mean				
Untreated	47.1 b	2.3 a	3401 b	3.3 b
Temik 15G 5 lb/A (F)	56.1 a	1.5 b	4224 a	4.0 a

[1] (F) = in-furrow (12 May).

[2] Determined from counts in a 6-ft section of each row per plot.

[3] Rating scale: 0=none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of root system with galls. Ratings were made on four randomly selected plants per plot.

[4] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint weight (480 lb bale) was determined by ginning samples of seed cotton from each variety. Plots were harvested on 4 Nov.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XII. YIELD AND GROWTH RESPONSE OF COTTON VARIETIES WITH SEED TREATMENT, FOLIAR, AND IN-FURROW NEMATICIDES (COTVARNEMA214, Morgan Farm, Suffolk)

A. PURPOSE: To compare the efficacy and benefits of nematicide treatments and variety selection for control of southern root-knot nematode in cotton production.

B. EXPERIMENTAL DESIGN:
1. Split-plot design with four randomized complete blocks separated by 8-ft alleyways
2. Main plots of varieties and treatments in subplots
3. Two, 30-ft rows per subplot at 36-in. row spacing and seeding rate of three seed/ft of row

C. APPLICATION OF TREATMENTS: (S) Seed treatments were applied by personnel with Bayer CropScience. Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g a.i./cwt as a base fungicide treatment was applied to all seed. (F) Granular treatments were applied to the seed furrow with a Noble Box, and liquid in-furrow treatments were mixed in water and applied at a volume of 5 gal/A through a microtube to the seed furrow at planting. (FS) Vydate L was applied as a foliar spray (FS) with a backpack sprayer having two, 8004E nozzles/row delivering 19.5 gal/A at the two-leaf stage (10 Jun), and pin head square (1 Jul) using 2 8002VS nozzles at 19.5 gal/A.

D. VARIETY (Main plots):
1. ST4946 GLB2
2. FM1944 (root-knot nematode susceptible standard)

E. TREATMENT, RATE AND APPLICATION METHOD (Sub-plots): F=in furrow, S=seed treatment, FS=foliar spray.
1. Gaucho 600FS 0.5 mg ai/seed (S)
2. Temik 15G 5 lb/A (F)
3. Velum Total 18 fl oz/A (F)
   + Aeris SAS 0.75 mg ai/seed (S)
4. Aeris SAS 0.75 mg ai/seed (S)
5. Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg ai/seed (S)
6. Aeris SAS 0.75 mg ai/seed (S)
   +Vydate CL-V 17 fl oz (FS, 2nd leaf, pin head square)

F. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: Continuous cotton since 2001
3. Land preparation: disk in early spring followed by rip and strip till rows
4. Planting date: 12 May
5. Soil fertility report (Jan 2014):

pH	6.1	Mn	2.9 ppm
Ca.....	680 ppm	Cu	0.6 ppm
Mg.....	65 ppm	Fe.....	12.5 ppm
P	95 ppm	B	0.1 ppm
K	182 ppm		
Zn.....	1.1 ppm	Soil type	Kenansville loamy fine sand

6. Nematode assay report (12 May):

Nematodes/500 cc soil	
Root knot	60
Lesion	80
Stunt.....	60
Spiral.....	440
Lance	20
Stubby root.....	60

7. Herbicide Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun)
8. Fertilization: 7-0-40 300 lb/A (14 Apr)
   ENC 1.0 qt/A (6 Jun, 2 Jul)
   24% Nitrogen 81.6 units (23 Jun)
9. Insecticide: Orthene 97S 6 oz/A (6 Jun)
   Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
10. Growth regulator: Pentia 16 fl oz/A (14 Jul)
11. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz + Dropp 2 fl oz/A (17 Oct)
12. Harvest date: 4 Nov

Table 37. Effect of treatments on emergence, plant health, growth and flowering of cotton.

Variety, treatment, rate and application method/timing[1]	Plants/ft[2] (10 Jun)	% vigor[3] (10 Jun)	Plant height (in.)[4] (17 Jul)	No. flowers/ 12 ft[5] (21 Jul)
ST4946 GLB2				
Gaucho 600FS 0.5 mg ai/seed (S)	1.8	95.3	30.6 cd	19.5
Temik 15G 5 lb/A (F)	1.7	96.3	32.0 a	25.5
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	2.0	96.5	31.0 bc	21.8
Aeris SAS 0.75 mg ai/seed (S)	1.7	94.5	30.0 d	16.3
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	1.8	96.3	31.5 ab	19.5
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	1.7	92.8	31.0 bc	17.3
FM1944 GLB2				
Gaucho 600FS 0.5 mg ai/seed (S)	1.6	90.5	29.6 c	15.3
Temik 15G 5 lb/A (F)	1.4	93.8	31.3 a	15.3
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	1.6	91.8	31.2 ab	18.0
Aeris SAS 0.75 mg ai/seed (S)	1.7	95.3	29.3 c	13.3
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	1.5	90.0	29.6 c	11.3
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	1.7	96.5	30.5 b	13.8
***Split-plot analysis, P*(F)**				
Variety	**0.01**	**0.05**	0.18	**0.02**
Treatment	0.11	0.91	0.0001	0.20
Variety x treatment	0.09	0.27	**0.002**	0.70
Variety mean				
ST4946 GLB2	1.8 a	95.3 a	31.0	20.0 a
FM1944 GLB2	1.6 b	93.0 b	30.2	14.5 b
Treatment mean				
Gaucho 600FS 0.5 mg ai/seed (S)	1.7	92.9	30.1	17.4
Temik 15G 5 lb/A (F)	1.5	95.0	31.6	20.4
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	1.8	94.1	31.1	19.9
Aeris SAS 0.75 mg ai/seed (S)	1.7	94.9	29.7	14.8
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	1.6	93.1	30.5	15.4
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	1.7	94.6	30.8	15.5

[1] S=seed treatment, F=in furrow; FS. = foliar spray. Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/cwt as a base fungicide treatment was applied to all seed. Seed treatments were applied by personnel with Bayer CropScience.

[2] Determined from counts of two, 30-ft rows per plot.

[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.

[4] Measurements of three, randomly selected plants in each row per plot.

[5] Determined from counts in two, 6-ft. sections of row per plot.

Means within a column and group followed by the same letter(s) are not significantly different at $P=0.05$ according to Fisher's Protected LSD.

Table 38. Mid-season nematode populations in cotton.

Variety, treatment, rate and application method/timing[1]	Nematodes/500 cc soil (10 Jul)[2]			
	Root knot	Stunt	Spiral	Stubby root
ST4946 GLB2				
Gaucho 600FS 0.5 mg ai/seed (S)	120	60	240	20
Temik 15G 5 lb/A (F)	0	30	100	0
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	20	40	940	0
Aeris SAS 0.75 mg ai/seed (S)	0	0	280	0
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	0	20	180	0
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	0	40	80	0
FM1944 GLB2				
Gaucho 600FS 0.5 mg ai/seed (S)	0	40	360	0
Temik 15G 5 lb/A (F)	40	20	280	20
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	60	20	160	0
Aeris SAS 0.75 mg ai/seed (S)	160	420	720	100
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	0	100	220	40
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	0	40	240	20

[1] S=seed treatment, F=in furrow; FS. = foliar spray. Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/cwt as a base fungicide treatment was applied to all seed. Seed treatments were applied by personnel with Bayer CropScience.

[2] Soil was sampled on 10 Jul and a composite of the four reps was made for each treatment.

Table 39. Effect of treatments on earliness and yield of cotton.

Variety, treatment, rate and application method/timing[1]	No. open bolls /12 ft[2] (1 Oct)	Yield[3]	
		lb/A	bales/A
ST4946 GLB2			
Gaucho 600FS 0.5 mg ai/seed (S)	39.0 a	3857 b	3.7 b
Temik 15G 5 lb/A (F)	32.0 ab	3887 b	3.7 b
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	36.5 ab	4247 a	4.1 a
Aeris SAS 0.75 mg ai/seed (S)	33.5 ab	3712 b	3.6 b
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	28.0 b	3999 ab	3.9 ab
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	35.0 ab	4005 ab	3.9 ab
FM1944 GLB2			
Gaucho 600FS 0.5 mg ai/seed (S)	34.0 e	3488 bc	3.1 bc
Temik 15G 5 lb/A (F)	64.0 a	3675 a-c	3.3 a-c
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	44.5 cd	3990 a	3.6 a
Aeris SAS 0.75 mg ai/seed (S)	49.5 bc	3621 a-c	3.2 a-c
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	54.5 b	3343 c	3.0 c
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	38.5 de	3836 ab	3.4 ab
***Split-plot analysis, P*(F)**			
Variety	**0.02**	0.06	**0.01**
Treatment	**0.01**	**0.003**	**0.004**
Variety x treatment	**0.0003**	0.26	0.28
Variety mean			
ST4946 GLB2	34.0	3951	3.8 a
FM1944 GLB2	47.5	3659	3.3 b
Treatment mean			
Gaucho 600FS 0.5 mg ai/seed (S)	36.5 b	3672 c	3.4 bc
Temik 15G 5 lb/A (F)	48.0 a	3781 bc	3.5 bc
Aeris .75 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	40.5 b	4119 a	3.8 a
Aeris SAS 0.75 mg ai/seed (S)	41.5 b	3666 c	3.4 c
Gaucho 600FS 0.5 mg ai/seed + Fluopyram 600FS 0.35 mg ai/seed(S)	41.3 b	3671 c	3.4 bc
Aeris SAS 0.75 mg ai/seed (S) Vydate CL-V 17 fl oz/A (FS, 2nd LF, PHS)	36.8 b	3920 ab	3.6 ab

[1] S=seed treatment, F=in furrow; FS. = foliar spray. Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/cwt as a base fungicide treatment was applied to all seed. Seed treatments were applied by personnel with Bayer CropScience.

[2] Determined from counts in two, 6-ft. sections of row per plot.

[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 46.2% of weight for ST4946 GLB2 and 42.9% of weight for FM1944 GLB2, and 480 lb/bale. Plots were harvested on 4 Nov.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XIII. COTTON SEED TREATMENT NEMATICIDE TEST (COTSEEDNEMA114, Morgan Farm, Suffolk)

A. PURPOSE: To compare seed treatments for control of nematodes in cotton.

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 8 ft alleys.
2. Two, 30-ft rows with 36-in. row spacing
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: All treatments received Spera FS 54.8 ml + Allegiance FL 48.9 ml + Vortex FL 5.5 ml + Evergol Prime 5 g a.i./100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.

D. TREATMENT AND RATE AI/SEED (unless otherwise indicated):
1. Gaucho 600FS 0.375 mg
2. Gaucho 600FS 0.375 mg
   + Serenade ASO 1 MIU/seed
3. Gaucho 600FS 0.375 mg
   + Test Compound 1 MIU/seed
4. Gaucho 600FS 0.375 mg
   + GB132 1 MIU/seed
5. Gaucho 600FS 0.375 mg
   + GB133 1 MIU/seed
6. Gaucho 600FS 0.375 mg
   + Agriplier Seed Treatment (1)
7. Gaucho 600FS 0.375 mg
   + Agriplier Seed Treatment (2)

E. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: continuous cotton since 2001
3. Land preparation: disk in early spring followed by rip and strip till
4. Planting date and variety: 12 May, ST 4946 GLB2
5. Soil fertility report (Mar 2014):

pH	6.2	Mn	2.4 ppm
Ca.....	662 ppm	Cu	0.6 ppm
Mg.....	59 ppm	Fe.....	13.5 ppm
P	98 ppm	B	0.1 ppm
K	172 ppm		
Zn.....	1.1 ppm	Soil type	Rumford loamy fine sand

6. Nematode assay report (12 May):

Nematodes/500 cc soil	
Root knot	40
Stunt.....	80
Spiral.....	1820
Stubby root.....	280

7. Herbicide Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun, 2 Jul)
8. Fertilization: 7-0-40 300 lb/A (14 Apr)
   ENC 1.0 qt/A (6 Jun, 2 Jul)
   81.6 units 24% Nitrogen (23 Jun)
9. Insecticide: Orthene 97S 6 oz/A (6 Jun)
   Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
10. Growth regulator: Pentia 16 fl oz/A (14 Jul)
11. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz + Dropp 2 fl oz/A (17 Oct)
12. Harvest date: 4 Nov

Table 40. Effect of treatments on emergence, plant health, growth, and flowering of cotton.

	Plants/ft[2]		**% vigor[3]**			**Plant height (in.)[4] (16 Jul)**	**Flowers/ 12 ft[5] (21 Jul)**
Treatment, rate ai/seed (unless otherwise indicated) [1]	**28 May**	**10 Jun**	**28 May**	**10 Jun**	**24 Jun**		
Gaucho 600FS 0.375 mg	1.5	1.4	95.8 ab	97.0	94.5	30.8 ab	24.5
Gaucho 600FS 0.375 mg + Serenade ASO 1 MIU/seed	1.4	1.3	90.0 c	93.8	91.3	31.1 ab	22.8
Gaucho 600FS 0.375 mg + Test Compound 1 MIU/seed	1.4	1.3	91.3 bc	92.3	92.8	30.6 a-c	25.5
Gaucho 600FS 0.375 mg + GB132 1 MIU/seed	1.5	1.4	95.3 ab	97.0	93.8	31.3 a	20.8
Gaucho 600FS 0.375 mg + GB133 1 MIU/seed	1.4	1.3	95.8 ab	94.3	90.0	29.7 c	22.0
Gaucho 600FS 0.375 mg + Agriplier Seed Treatment (1)	1.5	1.3	95.3 ab	95.0	94.3	30.3 bc	18.0
Gaucho 600FS 0.375 mg + Agriplier Seed Treatment (2)	1.5	1.4	98.5 a	96.5	96.3	30.9 ab	24.5
P(F)	0.81	0.93	**0.02**	0.46	0.56	**0.02**	0.08

[1] All treatments received Spera FS 54.8 ml + Allegiance FL 48.9 ml + Vortex FL 5.5 ml + Evergol Prime 5 g a.i./100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.
[2] Determined from counts of two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
[4] Measurements of three, randomly selected plants in each row per plot.
[5] Determined from counts in a 6-ft section of each row per plot.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 41. Effect of treatments on earliness and yield of cotton.

Treatment, rate ai/seed, (unless otherwise indicated) [1]	**Open bolls**[2] **(29 Sep)**	**Yield**[3]	
		lb/A	**bales/A**
Gaucho 600FS 0.375 mg	41.0 bc	4208	4.0
Gaucho 600FS 0.375 mg + Serenade ASO 1 MIU/seed	39.5 bc	4250	4.1
Gaucho 600FS 0.375 mg + Test Compound 1 MIU/seed	35.0 c	4120	3.9
Gaucho 600FS 0.375 mg + GB132 1 MIU/seed	56.8 a	4250	4.1
Gaucho 600FS 0.375 mg + GB133 1 MIU/seed	47.0 ab	4156	4.0
Gaucho 600FS 0.375 mg + Agriplier Seed Treatment (1)	46.8 ab	4057	3.9
Gaucho 600FS 0.375 mg + Agriplier Seed Treatment (2)	46.5 a-c	4165	4.0
P(F)	**0.02**	0.98	0.98

[1] All treatments received Spera FS 54.8 ml + Allegiance FL 48.9 ml + Vortex FL 5.5 ml + Evergol Prime 5 g a.i./100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.

[2] Determined from counts in a 6-ft section of each row per plot.

[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 45.8% of weight and 480 lb/bale. Plots were harvested on 4 Nov.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XIV. COTTON SEED TREATMENT NEMATICIDE TEST (COTSEEDNEMA214, Morgan Farm, Suffolk)

A. PURPOSE: To compare efficacy of in-furrow treatments for control or suppression of nematodes in cotton.

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 8-ft alleys
2. Two, 30-ft rows per plot with 36-in. row spacing
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: (S) All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g a.i./100 kg seed. Seed was treated by personnel at Bayer CropScience. (F) Granular treatments were applied to the seed furrow with a Noble Box, and liquid in-furrow treatments were mixed in water and applied at a volume of 5 gal/A through a microtube to the seed furrow at planting on 13 May. Foliar sprays were at pin head square (PHS, 1 Jul) and 14 days after pin head square (PHS+14d, 15 Jul). Sprays were applied over each row at 16.0 gal/A with two 8002 nozzles/row.

D. TREATMENT, RATE, AND APPLICATION METHOD/TIMING:
1. Gaucho 600FS 0.13 mg ai/seed (S)
2. Gaucho 600FS 0.13 mg ai/seed (S)
   + Temik 15G 5 lb/A (F)
3. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 10 fl oz/A (F)
4. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 14 fl oz/A (F)
5. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 18 fl oz/A (F)
6. Aeris Seed Applied System 0.75 mg ai/seed
   + Trilex Advanced FS300 (S)
7. Aeris Seed Applied System 0.75 mg ai/seed
   + Trilex Advanced FS300 (S)
   + Velum Total 14 fl oz/A (F)
8. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 18 fl oz/A (F)
   Movento MPC 8 fl oz/A (PHS, PHS + 14d)

E. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: continuous cotton since 2001
3. Land preparation: disk in early spring followed by rip and strip till
4. Planting date and variety: 13 May, ST5458 B2RF

5. Soil fertility report (Jan 2014):

pH	6.1	Mn	2.9 ppm
Ca.....	680 ppm	Cu	0.6 ppm
Mg.....	65 ppm	Fe.....	12.5 ppm
P	95 ppm	B	0.1 ppm
K	182 ppm		
Zn.....	1.1 ppm	Soil type	Kenansville loamy fine sand

6. Nematode assay report (13 May):

Nematodes/500 cc soil	
Root knot	180
Stunt.....	180
Spiral.....	120
Stubby root.....	120

7. Herbicide Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun)
8. Fertilization: 7-0-40 300 lb/A (14 Apr)
   ENC 1.0 qt/A (6 Jun, 2 Jul)
   24% Nitrogen 81.6 units (23 Jun)
9. Insecticide: Orthene 97S 6 oz/A (6 Jun)
   Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
10. Growth regulator: Pentia 16 fl oz/A (14 Jul)
11. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz
    + Dropp 2 fl oz/A (17 Oct)
12. Harvest date: 4 Nov

Table 42. Effect of treatments on emergence, vigor, thrips injury, growth and flowering in cotton.

Treatment, rate, and application method/timing[1]	Plants/ft[2] (10 Jun)	% vigor[3] (10 Jun)	Thrips injury[4]		Plant height (in.)[5] (16 Jul)	Flowers/ 12 ft[6] (21 Jul)
			30 May	6 Jun		
Gaucho 600FS 0.13 mg ai/seed (S)	1.9 c	95.0	1.9 a	2.5 a	27.6 d	18.5
Gaucho 600FS 0.13 mg ai/seed (S) + Temik 15G 5 lb/A (F)	2.1 a-c	97.0	0.8 c	0.7 c	29.9 a	23.5
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 10 fl oz/A (F)	1.9 c	95.3	0.8 c	0.8 c	30.0 a	23.3
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 14 fl oz/A (F)	1.9 c	97.0	0.8 c	0.7 c	28.0 cd	17.3
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	1.9 c	96.3	0.5 d	0.5 d	29.2 ab	19.0
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S)	2.3 a	99.3	1.3 b	1.5 b	28.7 bc	18.5
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	2.2 ab	98.5	0.5 d	0.4 d	28.9 b	21.3
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	2.0 bc	96.5	0.5 d	0.5 d	28.7 bc	15.3
P(F)	**0.01**	0.13	**0.0001**	**0.0001**	**0.0001**	0.10

[1] F=in furrow (13 May), S=seed treatment, PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 day (15 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Determined from counts of two, 30-ft rows per plot.

[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.

[4] Thrips injury rating scale: 0= no damage, 5=dead plants.

[5] Measurements of three, randomly selected plants in each row per plot.

[6] Determined from counts in a 6-ft section of each row per plot.

Means within a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 43. Effect of treatments on nematode populations in cotton.

Treatment, rate, and application method/timing[1]	Nematodes/500 cc soil (12 Aug)[2]				
	Root knot juvenile	Lesion	Stunt	Spiral	Stubby root
Gaucho 600FS 0.13 mg ai/seed (S)	100	0	60	120	40
Gaucho 600FS 0.13 mg ai/seed (S) + Temik 15G 5 lb/A (F)	200	0	140	240	60
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 10 fl oz/A (F)	460	20	60	440	200
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 14 fl oz/A (F)	400	0	240	60	180
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	880	0	160	460	460
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S)	540	0	180	320	160
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	260	0	180	260	160
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	160	20	340	180	200

[1] F=in furrow (13 May), S=seed treatment, PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 day (15 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Soil was sampled on 12 Aug. Data are counts of nematodes in a composite sample from four reps of each treatment.

Table 44. Effect of treatments on earliness and yield of cotton.

Treatment, rate, and application method/timing[1]	Open bolls[2] (1 Oct)	Yield[3]	
		lb/A	bales/A
Gaucho 600FS 0.13 mg ai/seed (S)	33.5	4005	3.7
Gaucho 600FS 0.13 mg ai/seed (S) + Temik 15G 5 lb/A (F)	43.8	4060	3.8
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 10 fl oz/A (F)	42.5	3942	3.7
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 14 fl oz/A (F)	41.0	3939	3.7
Gaucho 600FS 0.13 mg ai/seed (S) + Velum Total 18 fl oz/A (F)	29.3	4005	3.7
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S)	44.5	4093	3.8
Aeris SAS 0.75 mg ai/seed + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	40.8	3957	3.7
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	33.8	4229	4.0
P(F)	0.18	0.87	0.87

[1] F=in furrow (13 May), S=seed treatment, PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 day (15 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Determined from counts in a 6-ft section of each row per plot.

[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 44.8% of weight and 480 lb/bale. Plots were harvested on 4 Nov.

XV. COTTON SEED TREATMENT NEMATICIDE TEST (COTSEEDNEMA314, Morgan Farm, Suffolk)

A. PURPOSE: To compare seed treatments for control of nematodes in cotton.

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 8 ft alleys.
2. Two, 30-ft rows with 36-in. row spacing
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: All treatments received Spera FS 27 g + Allegiance FL 15.6 g + Evergol Prime 5 g ai/100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.

D. TREATMENT AND RATE AI/SEED:
1. Untreated
2. Gaucho 600FS 0.375 mg
3. Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.20 mg
4. Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.25 mg
5. Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.30 mg
6. Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg
7. Aeris Seed Applied System 0.75 mg
8. Aeris Seed Applied System 0.75 mg + Fluopyram 600FS 0.20 mg

E. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: continuous cotton since 2001
3. Land preparation: disk in early spring followed by rip and strip till
4. Planting date: 12 May, ST5458 B2RF
5. Soil fertility report (Mar 2014):

pH	6.2	Mn	2.4 ppm
Ca.....	662 ppm	Cu	0.6 ppm
Mg.....	59 ppm	Fe.....	13.5 ppm
P	98 ppm	B	0.1 ppm
K	172 ppm		
Zn.....	1.1 ppm	Soil type	Rumford loamy fine sand

6. Nematode assay report (13 May):

Nematodes/500 cc soil	
Root knot	40
Lesion	40
Stunt.....	40
Spiral.....	460
Stubby root.....	160

7. Herbicide Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun)
8. Fertilization: 7-0-40 300 lb/A (14 Apr)
   ENC 1.0 qt/A (6 Jun, 2 Jul)
   24% Nitrogen 81.6 units (23 Jun)
9. Insecticide: Orthene 97S 6 oz/A (6 Jun)
   Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
10. Growth regulator: Pentia 16 fl oz/A (14 Jul)
11. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz + Dropp 2 fl oz/A (17 Oct)
12. Harvest date: 4 Nov

Table 45. Effect of treatments on emergence, plant health, and phytotoxicity of cotton.

Treatment and rate ai/seed[1]	Plants/ft[2]		% vigor[3]		% phytotoxicity[4]
	28 May	17 Jun	28 May	17 Jun	(28 May)
Untreated	1.9	2.0	96.5	86.3	1.5
Gaucho 600FS 0.375 mg	1.8	2.2	97.3	95.8	2.5
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.20 mg	1.9	2.0	95.8	97.0	0.5
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.25 mg	1.9	2.1	97.0	92.0	0.5
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.30 mg	1.9	2.2	95.8	96.3	0.8
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg	1.8	2.0	95.5	92.0	1.0
Aeris Seed Applied System 0.75 mg	1.8	2.0	96.0	94.8	1.3
Aeris Seed Applied System 0.75 mg + Fluopyram 600FS 0.20 mg	1.8	2.0	98.3	95.8	2.0
P(F)	0.94	0.74	0.92	0.13	0.46

[1] All treatments received Spera FS 27 g + Allegiance FL 15.6 g + Evergol Prime 5 g ai/100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.
[2] Determined from counts of two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
[4] Percent total plants with phytotoxicity symptoms.

Table 46. Effect of treatments on thrips injury, growth, and flowering of cotton.

Treatment and rate ai/seed [1]	Thrips injury[2] 30 May	Thrips injury[2] 6 Jun	Plant height (in.)[3] (16 Jul)	Flowers/ 12 ft[4] (21 Jul)
Untreated	4.1 a	4.6 a	25.1 e	11.3 c
Gaucho 600FS 0.375 mg	1.8 b	2.0 c	26.9 d	15.3 bc
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.20 mg	1.8 b	2.0 c	28.5 ab	22.8 a
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.25 mg	1.5 d	1.9 c	27.8 bc	18.0 ab
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.30 mg	1.7 bc	1.7 d	27.9 bc	16.8 a-c
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg	1.1 e	1.6 d	27.4 cd	14.3 bc
Aeris Seed Applied System 0.75 mg	1.7 bc	2.7 b	28.8 a	19.3 ab
Aeris Seed Applied System 0.75 mg + Fluopyram 600FS 0.20 mg	1.6 cd	2.0 c	27.2 cd	17.8 ab
P(F)	**0.0001**	**0.0001**	**0.0001**	**0.05**

[1] All treatments received Spera FS 27 g + Allegiance FL 15.6 g + Evergol Prime 5 g ai/100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.

[2] Thrips injury rating scale: 0=no damage, 5=dead plants.

[3] Measurements of three, randomly selected plants in each row per plot.

[4] Determined from counts in a 6-ft section of each row per plot.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 47. Effect of treatments on nematode populations in cotton.

Treatment and rate ai/seed[1]	Nematodes/500 cc soil (12 Aug)[2]			
	Root knot juvenile	Stunt	Spiral	Stubby root
Untreated	0	240	1380	220
Gaucho 600FS 0.375 mg	80	260	540	240
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.20 mg	120	100	360	260
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.25 mg	0	120	1560	260
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.30 mg	180	200	760	540
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg	0	120	460	500
Aeris Seed Applied System 0.75 mg	170	140	480	980
Aeris Seed Applied System 0.75 mg + Fluopyram 600FS 0.20 mg	0	160	740	340

[1] All treatments received Spera FS 27 g + Allegiance FL 15.6 g + Evergol Prime 5 g ai/100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.
[2] Soil was sampled on 12 Aug. Data are counts of nematodes in a composite sample from four reps of each treatment.

Table 48. Effect of treatments on earliness and yield of cotton.

Treatment and rate/ai seed[1]	Open bolls[2] (29 Sep)	Yield[3]	
		lb/A	bales/A
Untreated	28.3 c	3545	3.3
Gaucho 600FS 0.375 mg	49.0 ab	3421	3.2
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.20 mg	38.5 bc	4008	3.7
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.25 mg	44.8 ab	3923	3.7
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.30 mg	40.5 ab	3775	3.5
Gaucho 600FS 0.375 mg + Fluopyram 600FS 0.35 mg	39.0 bc	3615	3.4
Aeris Seed Applied System 0.75 mg	50.8 a	3954	3.7
Aeris Seed Applied System 0.75 mg + Fluopyram 600FS 0.20 mg	49.0 ab	3827	3.6
P(F)	**0.01**	0.27	0.27

[1] All treatments received Spera FS 27 g + Allegiance FL 15.6 g + Evergol Prime 5 g ai/100 kg seed as a base seed treatment. All seed treatments were applied by personnel with Bayer CropScience.
[2] Determined from counts in a 6-ft section of each row per plot.
[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 44.6% of weight and 480 lb/bale. Plots were harvested on 4 Nov.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XVI. COTTON SEED TREATMENT NEMATICIDE TEST (COTSEEDNEMA414, TAREC Research Farm, Field 9B)

A. PURPOSE: To compare efficacy of in-furrow treatments for control or suppression of nematodes in cotton.

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 8-ft alleys
2. Two, 30-ft rows per plot with 36-in. row spacing
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: (S) All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience. (F) Granular treatments were applied to the seed furrow with a Noble Box, and liquid in-furrow treatments were mixed in water and applied at a volume of 5 gal/A through a microtube to the seed furrow at planting on 9 May. Foliar sprays were applied at pin head square (PHS, 30 Jun) and 14 days after pin head square (PHS+14d, 12 Jul). Sprays were applied over each row at 16 gal/A with two 8002 nozzles/row spaced 18 inches apart.

D. TREATMENT AND RATE:
1. Gaucho 600FS 0.13 mg ai/seed (S)
2. Gaucho 600FS 0.13 mg ai/seed (S)
   + Temik 15G 5 lb/A (F)
3. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 10 fl oz/A (F)
4. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 14 fl oz/A (F)
5. Gaucho 600FS 0.13 mg a.i./seed (S)
   + Velum Total 18 fl oz/A (F)
6. Aeris Seed Applied System 0.75 mg a.i./seed
   + Trilex Advanced FS300 (S)
7. Aeris Seed Applied System 0.75 mg a.i./seed
   + Trilex Advanced FS300 (S)
   + Velum Total 14 fl oz/A (F)
8. Gaucho 600FS 0.13 mg ai/seed (S)
   + Velum Total 18 fl oz/A (F)
   Movento MPC 8 fl oz/A (PHS, PHS + 14d)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Peanut 2013; corn 2012, cotton 2011
3. Land preparation: rip and strip till rows
4. Planting date and variety: 9 May, ST5458 B2RF
5. Soil fertility report (Jan 2014):

pH	6.3	Mn	1.5 ppm
Ca.....	594 ppm	Cu	0.3 ppm
Mg.....	48 ppm	Fe.....	14.7 ppm
P	59 ppm	B	0.1 ppm
K	89 ppm		
Zn.....	0.4 ppm	Soil type	Kenansville loamy fine sand

6. Nematode assay report (12 May):

Nematodes/500 cc soil	
Root knot	500
Stunt.....	140
Lance	40
Ring	280
Stubby root.....	20

7. Herbicide Pre-emergence – Cotoran 4L 1.0 qt + Prowl 1.0/A (8 May)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (27 May, 4 Jun)
8. Fertilization: ENC 1.0 qt/A (27 May, 6 Jun)
9. Insecticide: Orthene 75S 6 oz/A (27 May, 4 Jun)
   Belt 2 fl oz + Baythroid XL 2 oz/A (14 Aug)
10. Growth regulator: Pentia 6 fl oz/A (26 Jun); 8 oz/A (14 Jul)
11. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (6 Oct)
12. Harvest date: 21 Oct

Table 49. Effect of treatments on emergence, plant health, and thrips injury in cotton.

Treatment and rate ai/seed (unless otherwise indicated), application method/timing[1]	**Plants/ft[2]**		**% vigor[3]**		**Thrips injury[4]**	
	23 May	**4 Jun**	**23 May**	**4 Jun**	**30 May**	**6 Jun**
Gaucho 600FS 0.13 mg(S)	2.2	2.2	92.5	94.0 c	1.8 a	1.6 a
Gaucho 600FS 0.13 mg (S) + Temik 15G 5 lb/A (F)	2.0	2.0	93.3	93.3 c	0.8 c	0.5 d
Gaucho 600FS 0.13 mg (S) + Velum Total 10 fl oz/A (F)	2.2	2.2	92.5	94.5 bc	0.8 c	0.8 c
Gaucho 600FS 0.13 mg (S) + Velum Total 14 fl oz/A (F)	2.2	2.2	94.5	94.5 bc	0.8 c	0.3 e
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F)	2.1	2.1	93.8	92.5 c	0.5 d	0.3 e
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S)	2.4	2.4	98.8	99.5 a	1.3 b	1.1 b
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	2.3	2.4	97.5	98.5 ab	0.6 d	0.5 d
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	2.1	2.2	93.8	93.3 c	0.5 d	0.4 d
P(F)	0.07	0.09	0.37	**0.02**	**0.0001**	**0.0001**

[1] F=in furrow (May), S=seed treatment, PHS=pin head square (30 Jun), PHS=14d=pin head square + 14 days (12 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Determined from counts of two, 30-ft rows per plot.

[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.

[4] Thrips injury rating scale: 0= no damage, 5=dead plants.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 50. Effect of treatments on nematode populations in cotton.

	Nematodes/500 cc soil (13 Aug)[2]				
Treatment and rate ai/seed (unless otherwise indicated), application method/timing[1]	**Root knot juvenile**	**Stunt**	**Spiral**	**Ring**	**Stubby root**
Gaucho 600FS 0.13 mg(S)	100	60	160	300	320
Gaucho 600FS 0.13 mg (S) + Temik 15G 5 lb/A (F)	100	20	0	100	120
Gaucho 600FS 0.13 mg (S) + Velum Total 10 fl oz/A (F)	180	20	60	340	60
Gaucho 600FS 0.13 mg (S) + Velum Total 14 fl oz/A (F)	0	100	0	200	140
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F)	60	140	20	380	120
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S)	0	200	0	180	120
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	20	100	0	160	40
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	100	20	40	200	100

[1] F=in furrow (May), S=seed treatment, PHS=pin head square (30 Jun), PHS=14d=pin head square + 14 days (12 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Soil was sampled on 13 Aug. Data are counts of nematodes in a composite sample from four reps of each treatment.

Table 51. Effect of treatments on growth, flowering, earliness, and yield of cotton.

Treatment and rate ai/seed (unless otherwise indicated), application method/timing[1]	Plant height (in.)[2] (11 Jul)	Flowers/ 12 ft[3] (15 Jul)	Open bolls[3] (17 Sep)	Yield[4]	
				lb/A	bales/A
Gaucho 600FS 0.13 mg(S)	24.3 b-d	13.5 bc	33.0	4438	3.9
Gaucho 600FS 0.13 mg (S) + Temik 15G 5 lb/A (F)	24.2 b-d	11.5 c	39.8	4507	4.0
Gaucho 600FS 0.13 mg (S) + Velum Total 10 fl oz/A (F)	23.5 d	17.8 a	35.8	4553	4.0
Gaucho 600FS 0.13 mg (S) + Velum Total 14 fl oz/A (F)	24.0 cd	16.3 ab	48.5	4220	3.7
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F)	24.7 bc	16.3 ab	56.8	4220	3.7
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S)	25.7 a	17.8 a	41.0	4701	4.1
Aeris Seed Applied System 0.75 mg + Trilex Advanced FS300 (S) + Velum Total 14 fl oz/A (F)	24.9 ab	17.8 a-c	46.0	4390	3.8
Gaucho 600FS 0.13 mg (S) + Velum Total 18 fl oz/A (F) Movento MPC 8 fl oz/A (PHS, PHS + 14d)	23.9 cd	11.3 c	44.8	3890	3.4
P(F)	**0.0001**	**0.02**	0.33	0.71	0.71

[1] F=in furrow (May), S=seed treatment, PHS=pin head square (30 Jun), PHS=14d=pin head square + 14 days (12 Jul). All seed received base seed treatment of Vortex FL 2.5 g + Allegiance FL 15.6 g + Spera 27 g + Evergol Prime 5 g ai/100 kg seed. Seed was treated by personnel at Bayer CropScience.

[2] Measurements of three, randomly selected plants in each plot.

[3] Determined from counts in a 6-ft section of each row per plot.

[4] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 42.1% of weight and 480 lb/bale. Plots were harvested on 21 Oct.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XVII. COTTON NEMATICIDE TEST (COTNEMA114, Morgan Farm, Suffolk)

A. PURPOSE: To compare combinations of Aeris Seed Applied System (SAS), Gaucho and experimental biologicals for control of nematodes in cotton

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 8-ft alleys
2. Two, 30-ft rows per plot with 36-in. row spacing
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: Granular in-furrow fungicides (F) applied to the seed furrow at planting using a Noble box (12 May). All seed treatments (S) received Baytan 30 10.0 g + Allegiance FL 15.6 g + Vortex FL 2.5 g a.i./100 kg seed as a base seed treatment; seed treatments were applied by personnel with Bayer CropScience. Foliar sprays were initiated at 21 days after emergence (21 DAE, 10 Jun), pin head square (PHS, 1 Jul) and 14 days after pin head square (PHS+14d, 15 Jul). Sprays were applied over each row at 8 gal/A on 10 Jun with one 8004E nozzle/row, and at 16.0 gal/A on 1 Jul and 15 Jul with two 8002 nozzles/row. Foliar sprays were mixed with Dyne-amic SL 0.25% v/v + UAN 28% 2.5 v/v.

D. TREATMENT, RATE AI/SEED (unless otherwise indicated) AND APPLICATION TIMING:
1. Gaucho 600FS 0.375 mg (S)
2. Gaucho 600FS 0.375 mg (S)
   Movento SC 8 fl oz/A (21 DAE, PHS)
3. Gaucho 600FS 0.375 mg (S)
   Movento SC 8 fl oz/A (PHS, PHS+14d)
4. Aeris Seed Applied System 0.75 mg (S)
5. Aeris Seed Applied System 0.75 mg (S)
   Movento SC 8 fl oz/A (21 DAE, PHS)
6. Aeris Seed Applied System 0.75 mg (S)
   Movento SC 8 fl oz/A (PHS, PHS+14d)
7. Gaucho 600FS 0.375 mg (S)
   + Burkholderia 10 lb/A (F)

E. ADDITIONAL INFORMATION:
1. Location: Rick Morgan Farm, Deer Forest Rd., Suffolk, VA
2. Crop history: continuous cotton since 2001
3. Land preparation: disk in early spring followed by rip and strip till
4. Planting date and variety: 12 May, FM 1944 GLB2
5. Soil fertility report (Jan 2014):

pH	6.3	Mn	1.5 ppm
Ca.....	594 ppm	Cu	0.3 ppm
Mg.....	48 ppm	Fe.....	14.7 ppm
P	59 ppm	B	0.1 ppm
K	89 ppm		
Zn.....	0.4 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide Pre-plant – Roundup WeatherMax 1 qt (3 Apr)
   Post-emergence – Roundup WeatherMax 22 fl oz/A (6 Jun)
7. Fertilization: 7-0-40 300 lb/A (14 Apr)
   ENC 1.0 qt/A (6 Jun, 2 Jul)
   24% Nitrogen 81.6 units (23 Jun)

8. Insecticide: Orthene 97S 6 oz/A (6 Jun)
   Belt 2 oz + Baythroid XL 2 oz/A (21 Aug)
9. Growth regulator: Pentia 16 fl oz/A (14 Jul)
10. Defoliant/boll opener: Finish 1.0 qt + Super Boll 1.0 pt + Folex 10 fl oz + Dropp 2 fl oz/A (17 Oct)
11. Harvest date: 4 Nov

Table 52. Nematode populations at planting in cotton.

Treatment, rate a.i./seed (unless otherwise indicated) and application method/timing[1]	Nematodes/500 cc soil (13 May)[2]					
	Root knot juvenile	Lesion	Stunt	Spiral	Lance	Stubby root
Gaucho 600FS 0.375 mg (S)	280	40	0	420	0	240
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	80	0	0	200	20	300
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	160	20	0	460	20	160
Aeris Seed Applied System 0.75 mg (S)	760	160	0	680	0	440
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	360	180	0	80	40	220
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	280	0	0	280	0	300
Gaucho 600FS 0.375 mg (S) + Burkholderia 10 lb/A (F)	200	60	40	360	0	200

[1] F=in furrow (12 May), S=seed treatment, DAE=days after emergence (10 Jun), PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 days (15 Jul) . All seed treatments received Baytan 30 10.0 g + Allegiance FL 15.6 g + Vortex FL 2.5 g ai/100 kg seed as a base seed treatment. Seed was treated by personnel at Bayer CropScience.

[2] Soil was sampled on 13 May. Data are counts of nematodes in a composite sample taken 4 reps of each treatment prior to planting.

Table 53. Effect of treatments on emergence, plant health, growth, and flowering of cotton.

Treatment, rate a.i./seed (unless otherwise indicated) and application method/timing[1]	**Plants/ft[2] (10 Jun)**	**% vigor[3] (10 Jun)**	**Plant height (in.)[4] (16 Jul)**	**Flowers/ 12 ft[5] (21 Jul)**
Gaucho 600FS 0.375 mg (S)	2.4 ab	97.0	29.3 c	16.0
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	2.4 a	95.0	29.4 c	14.8
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	2.5 a	97.5	29.5 bc	14.8
Aeris Seed Applied System 0.75 mg (S)	2.0 c	93.3	29.8 ab	16.0
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	2.1 bc	93.5	29.9 a	17.0
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	2.2 bc	93.3	29.9 a	17.5
Gaucho 600FS 0.375 mg (S) + Burkholderia 10 lb/A (F)	2.4 ab	97.8	29.8 ab	12.3
P(F)	**0.01**	0.30	**0.004**	0.75

[1] F=in furrow (12 May), S=seed treatment, DAE=days after emergence (10 Jun), PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 days (15 Jul) . All seed treatments received Baytan 30 10.0 g + Allegiance FL 15.6 g + Vortex FL 2.5 g ai/100 kg seed as a base seed treatment. Seed was treated by personnel at Bayer CropScience.

[2] Determined from counts of two, 30-ft rows per plot.

[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.

[4] Measurements of three, randomly selected plants in each row per plot.

[5] Determined from counts in a 6-ft section of each row per plot.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 54. Mid-season nematode populations in cotton.

Treatment, rate a.i./seed (unless otherwise indicated) and application method/timing[1]	Nematodes/500 cc soil (12 Aug)[2]					
	Root knot juvenile	Lesion	Stunt	Spiral	Lance	Stubby root
Gaucho 600FS 0.375 mg (S)	260	0	200	1300	0	280
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	0	0	0	940	20	540
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	180	0	0	1040	20	960
Aeris Seed Applied System 0.75 mg (S)	240	0	0	1280	0	780
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	180	0	0	260	0	460
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	340	0	0	540	0	560
Gaucho 600FS 0.375 mg (S) + Burkholderia 10 lb/A (F)	100	0	0	660	0	780

[1] F=in furrow (12 May), S=seed treatment, DAE=days after emergence (10 Jun), PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 days (15 Jul). All seed treatments received Baytan 30 10.0 g + Allegiance FL 15.6 g + Vortex FL 2.5 g ai/100 kg seed as a base seed treatment. Seed was treated by personnel at Bayer CropScience.

[2] Soil was sampled on 12 Aug. Data are counts of nematodes in a composite sample taken 4 reps of each treatment prior to planting.

Table 55. Effect of treatments on root galling, earliness, and yield of cotton.

Treatment, rate a.i./seed (unless otherwise indicated) and application method/timing[1]	Root gall index[2] (19 Sep)	Open bolls[3] (29 Sep)	Yield[4]	
			lb/A	bales/A
Gaucho 600FS 0.375 mg (S)	1.6	41.0 bc	3669	3.3
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	1.8	39.5 bc	3282	3.0
Gaucho 600FS 0.375 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	1.8	35.0 c	3273	2.9
Aeris Seed Applied System 0.75 mg (S)	1.7	56.8 a	3373	3.0
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (21 DAE, PHS)	1.6	47.0 ab	3648	3.3
Aeris Seed Applied System 0.75 mg (S) Movento SC 8 fl oz/A (PHS, PHS+14d)	1.6	46.8 ab	3694	3.3
Gaucho 600FS 0.375 mg (S) + Burkholderia 10 lb/A (F)	1.6	46.5 a-c	3491	3.1
P(F)	0.94	**0.03**	0.83	0.83

[1]F=in furrow (12 May), S=seed treatment, DAE=days after emergence (10 Jun), PHS=pin head square (1 Jul), PHS+14d=pin head square + 14 days (15 Jul) . All seed treatments received Baytan 30 10.0 g + Allegiance FL 15.6 g + Vortex FL 2.5 g ai/100 kg seed as a base seed treatment. Seed was treated by personnel at Bayer CropScience. [2]Rating scale: 0=none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of root system with galls. Ratings were made on four randomly selected plants per plot. [3]Determined from counts in a 6-ft section of each row per plot. [4]Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 43.2% of weight and 480 lb/bale. Plots were harvested on 4 Nov. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XVIII. COTTON INCORPORATED REGIONAL TARGET SPOT FUNGICIDE EVALUATION TEST (COTFOLFUN114, Tidewater Research Farm, Field 16B)

A. PURPOSE: To evaluate the effectiveness of single and two application programs of selected registered and candidate fungicides on two cotton varieties for the control of target spot and yield response.

B. EXPERIMENTAL DESIGN:
1. Five randomized complete blocks separated by 10 ft alleyways
2. Full-factorial design with treatments in four, 30-ft rows per plot; data collected from the two, center rows
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: Foliar treatments were applied at 1st bloom (22 Jul) and 1st bloom + 14 d (6 Aug) with a Lee Spider Sprayer having 8002VS nozzles spaced 18 inches apart and delivering 19.88 gal/A.

D. VARIETY, TREATMENT, RATE/A AND APPLICATION TIMING:
PHY499
1. Untreated check (no single application)
2. Headline SC 6 fl oz (1st bloom)
3. Topguard 7 fl oz (1st bloom)
4. Priaxor SC 4 fl oz (1st bloom)
5. Quadris 2.08SC 6 fl oz (1st bloom)
6. Untreated check (no two applications)
7. Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)
8. Topguard 7 fl oz (1st bloom, 1st bloom + 14d)
9. Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)
10. Quadris 2.08SC 6 fl oz (1st bloom, 1st bloom + 14d)

DP1137
11. Untreated check (no single application)
12. Headline SC 6 fl oz (1st bloom)
13. Topguard 7 fl oz (1st bloom)
14. Priaxor SC 4 fl oz (1st bloom)
15. Quadris 2.08SC 6 fl oz (1st bloom)
16. Untreated check (no two applications)
17. Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)
18. Topguard 7 fl oz (1st bloom, 1st bloom + 14d)
19. Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)
20. Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)

E. ADDITIONAL INFORMATION:
1. Location: Tidewater Research Farm, Suffolk
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Land preparation: rip and strip till
4. Planting date and cultivar: 12 May

5. Soil fertility report (Jan 2014) :

pH.....	6.4	K	183 ppm
Ca	959 ppm	Zn.....	0.6 ppm
Mg	84 ppm	Mn.....	1.8 ppm
P.....	34 ppm	Soil type.....	Nansemond fine sandy loam

6. Herbicide:
   Pre-plant – Touchdown 1.0 qt/A (4 Apr)
   Pre-emergence – Touchdown 22 fl oz + Acumen 1.5 pt
   + Cotoran 4L 1.0 qt/A (12 May)
   Post-emergence – Touchdown 22 fl oz/A (28 May, 3 Jun)
   Roundup WeatherMax 22 fl oz/A (24 May)
   Buccaneer 22 fl oz (26 Jun)
7. Insecticide: Orthene 97S 6 oz/A (28 May); 8 oz/A (3 Jun)
   Baythroid XL 2 fl oz/A (31 Jul); 3 fl oz/A (8 Aug)
8. Fertilization: 6-16-39 330 lb/A (4 Apr)
   Liquid nitrogen (24%) 24-0-0-3 40 lb + Boron 1.0 qt/A (20 Jun)
9. Growth regulator: Pentia 6 fl oz/A (26 Jun); 12 fl oz/A (14 Jul)
10. Harvest date: 12 Nov

Table 56. Area under the disease progress curve (AUDPC) for target spot incidence, severity, and defoliation.

Variety, fungicide, rate/A and timing[1]	AUDPC incidence[2]	AUDPC severity[3]	AUDPC defoliation[4]
PHY499			
Untreated check (no single application)	620	124	707
Headline SC 6 fl oz (1st bloom)	863	152	659
Topguard 7 fl oz (1st bloom)	801	145	536
Priaxor SC 4 fl oz (1st bloom)	850	161	573
Quadris 2.08SC 6 fl oz (1st bloom)	819	161	583
Untreated check (no two applications)	516	111	773
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	709	124	641
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	918	193	589
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	608	102	740
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	766	174	689
DP1137			
Untreated check (no single application)	628	127	711
Headline SC 6 fl oz (1st bloom)	409	80	706
Topguard 7 fl oz (1st bloom)	577	119	520
Priaxor SC 4 fl oz (1st bloom)	355	68	907
Quadris 2.08SC 6 fl oz (1st bloom)	322	55	662
Untreated check (no two applications)	528	98	546
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	643	111	586
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	552	118	679
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	457	95	583
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	313	60	756
Factorial analysis, *P*(F)			
Fungicide (F)	0.30	0.28	0.46
Timing (T)	0.67	0.96	0.97
F*T	0.88	0.72	0.47
Variety (V)	**<.0001**	**<0.0001**	0.71
F*V	0.09	0.09	0.62
T*V	0.25	0.54	0.10
F*T*V	0.48	0.33	0.25
Variety Means			
PHY499	747 a	145 a	649 a
DP1137	478 b	93 b	665 a

[1] The first foliar application was made at first bloom on 22 Jul; the second application was made on 6 Aug.
[2] Incidence was evaluated as the percentage of total leaves with at least one target spot lesion.
[3] Severity was evaluated as the percentage of total leaf area with target spot lesions.
[4] Defoliation was evaluated as the percentage of the total canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 57. Final target spot incidence, severity, and defoliation evaluated on 2 Oct.

Variety, fungicide, rate/A and timing[1]	% incidence[2]	% severity[3]	% defoliation[4]
PHY499			
Untreated check (no single application)	21.9	1.5	35.0
Headline SC 6 fl oz (1st bloom)	38.8	2.6	38.8
Topguard 7 fl oz (1st bloom)	25.0	1.8	32.5
Priaxor SC 4 fl oz (1st bloom)	23.8	1.5	37.5
Quadris 2.08SC 6 fl oz (1st bloom)	26.3	2.5	32.5
Untreated check (no two applications)	8.8	0.9	45.0
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	18.1	1.5	40.0
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	20.6	1.6	36.3
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	26.3	1.9	41.3
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	21.3	1.5	45.0
DP1137			
Untreated check (no single application)	26.9	2.0	40.0
Headline SC 6 fl oz (1st bloom)	16.9	1.4	36.3
Topguard 7 fl oz (1st bloom)	13.1	1.3	31.3
Priaxor SC 4 fl oz (1st bloom)	13.8	1.3	51.3
Quadris 2.08SC 6 fl oz (1st bloom)	13.8	0.5	36.3
Untreated check (no two applications)	16.3	1.5	28.8
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	21.3	2.0	36.3
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	13.8	0.9	43.8
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	15.0	1.3	33.8
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	8.8	0.8	42.5
Factorial analysis, *P*(F)			
Fungicide (F)	0.64	0.71	0.78
Timing (T)	0.08	0.36	0.42
F*T	0.58	0.93	0.27
Variety (V)	**0.01**	0.10	0.89
F*V	0.23	0.27	0.77
T*V	0.28	0.36	0.12
F*T*V	0.59	0.65	0.29
Variety Means			
PHY499	23.1 a	1.7 a	38.4 a
DP1137	15.9 b	1.3 a	38.0 a

[1] The first foliar application was made at first bloom on 22 Jul; the second application was made on 6 Aug.
[2] Incidence was evaluated as the percentage of total leaves with at least one target spot lesion.
[3] Severity was evaluated as the percentage of total leaf area with target spot lesions.
[4] Defoliation was evaluated as the percentage of the total canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 58. Effect of treatments on yield of cotton.

Variety, fungicide, rate/A and timing[1]	Seed yield (lbs/A)[2]	Gin turn out[3]	Lint yield (lbs/A)[4]
PHY499			
Untreated check (no single application)	3863	48.8	1888
Headline SC 6 fl oz (1st bloom)	3751	47.4	1778
Topguard 7 fl oz (1st bloom)	4423	48.4	2141
Priaxor SC 4 fl oz (1st bloom)	4060	48.8	1982
Quadris 2.08SC 6 fl oz (1st bloom)	3818	47.7	1822
Untreated check (no two applications)	3802	48.0	1824
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	4066	49.6	2015
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	3896	50.8	1979
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	3893	48.7	1893
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	3863	48.8	1888
DP1137			
Untreated check (no single application)	3675	48.0	1765
Headline SC 6 fl oz (1st bloom)	3258	46.6	1517
Topguard 7 fl oz (1st bloom)	3545	47.1	1674
Priaxor SC 4 fl oz (1st bloom)	3521	46.8	1640
Quadris 2.08SC 6 fl oz (1st bloom)	3382	46.7	1582
Untreated check (no two applications)	3391	47.2	1600
Headline SC 6 fl oz (1st bloom, 1st bloom + 14d)	3748	46.5	1745
Topguard 7 fl oz (1st bloom, 1st bloom + 14d)	3470	47.9	1664
Priaxor SC 4 fl oz (1st bloom, 1st bloom + 14d)	3397	46.5	1578
Quadris 208SC 6 fl oz (1st bloom, 1st bloom + 14d)	3367	47.1	1580
Factorial analysis, *P*(F)			
Fungicide (F)	0.21	0.58	0.13
Timing (T)	0.99	0.15	0.69
F*T	0.36	0.15	0.50
Variety (V)	**<0.0001**	**<0.0001**	**<0.0001**
F*V	0.82	0.37	0.62
T*V	0.27	0.26	0.47
F*T*V	0.30	0.32	0.16
Variety Means			
PHY499	3925 a	48.6 a	1909 a
DP1137	3471 b	46.9 b	1628 b

[1] The first foliar application was made at first bloom on 22 Jul; the second application was made on 6 Aug.
[2] Lint + seed.
[3] Percent lint turn out from ginning.
[4] Weight of lint only. Plots were harvested on 12 Nov.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XIX. EVALUATION OF FUNGICIDES AND TIMINGS FOR CONTROL OF FOLIAR DISEASE IN COTTON (COTFOLFUN214, Tidewater AREC, Field 46C)

A. PURPOSE: To evaluate fungicide chemistries and application timings for disease control and yield response in cotton.

B. EXPERIMENTAL DESIGN:
1. Five randomized complete blocks separated by 10 ft alleyways
2. Six, 30-ft rows per plot; data collected from the two, center rows
3. Seeding rate of 3.5 seed/ft of row

C. APPLICATION OF TREATMENTS: The first foliar fungicide application was made 21 days after first bloom (DAB) on 6 Aug; the second application was made 15 days later (36 DAB) on 21 Aug. All treatments were applied with a Lee Spider Sprayer having 8002VS nozzles spaced 18 inches apart and delivering 19.88 gal/A.

D. TREATMENT AND RATE/A:
1. Untreated check
2. Headline 2.08SC 6 fl oz (21 DAB)
3. Twinline EC 8.5 fl oz (21 DAB)
4. Priaxor SC 4 fl oz (21 DAB)
5. Headline 2.08SC 6 fl oz (21 DAB)
   Headline 2.08SC 6 fl oz (36 DAB)
6. Twinline EC 8.5 fl oz (21 DAB)
   Twinline EC 8.5 fl oz (36 DAB)
7. Priaxor SC 4 fl oz (21 DAB)
   Priaxor SC 4 fl oz (36 DAB)
8. Headline 2.08SC 6 fl oz (36 DAB)
9. Twinline EC 8.5 fl oz (36 DAB)
10. Priaxor SC 4 fl oz (36 DAB)

E. ADDITIONAL INFORMATION:
1. Location: Tidewater Agricultural Research and Extension Center, Holland Rd., Suffolk, VA
2. Crop history: Peanut 2013, corn 2012, cotton 2011
3. Land preparation: rip and strip till
4. Planting date and cultivar: 12 May, PHY499 WRF
5. Soil fertility report (Jan 2014) :

pH.....	6.4	K	183 ppm
Ca	959 ppm	Zn.....	0.6 ppm
Mg	84 ppm	Mn.....	1.8 ppm
P.....	34 ppm	Soil type.....	Nansemond fine sandy loam

6. Herbicide:
   Pre-plant – Touchdown 1.0 qt/A (4 Apr)
   Pre-emergence – Touchdown 22 fl oz + Acumen 1.5 pt + Cotoran 4L 1.0 qt/A (12 May)
   Post-emergence – Touchdown 22 fl oz/A (28 May, 3 Jun)
   Roundup WeatherMax 22 fl oz/A (24 May)
   Buccaneer 22 fl oz (26 Jun)
7. Insecticide: Orthene 97S 6 oz/A (28 May); 8 oz/A (3 Jun)
   Belt 2 fl oz + Baythroid XL 2 fl oz/A (14 Aug)

8. Fertilization: 6-16-39 330 lb/A (22 Apr)
   Liquid nitrogen (24%) 24-0-0-3 40 lb + Boron 1.0 qt/A (20 Jun)
9. Growth regulator: Pentia 6 fl oz/A (26 Jun); 12 oz/A (14 Jul); 1.0 pt (22 Jul)
10. Defoliant/boll opener: Finish Pro 6 1.0 qt + Dropp SC 3 fl oz + Folex 10 fl oz + Super Boll 1.0 pt/A (17 Oct)
11. Harvest date: 5 Nov

Table 59. Effect of treatments on disease severity of cotton, 6 Sep.

Treatment, rate/A and application date[1]	% foliar disease[2] (6 Sep)		% Target spot[3] (6 Sep)		% defoliation[4] (6 Sep)
	Upper canopy	Mid-canopy	Mid-canopy	Lower canopy	
Untreated check	6.0 a	4.0	9.4 a	25.0 a	16.4 a
Headline 2.08SC 6 fl oz (8/6)	4.8 ab	4.6	1.4 c	3.2 c	4.6 c
Twinline EC 8.5 fl oz (8/6)	4.2 a-c	3.8	5.2 b	15.0 b	8.4 bc
Priaxor SC 4 fl oz (8/6)	4.0 bc	4.2	4.0 bc	7.8 bc	6.8 bc
Headline 2.08SC 6 fl oz (8/6) Headline 2.08SC 6 fl oz (8/21)	2.8 c	2.8	4.2 bc	9.0 bc	6.0 bc
Twinline EC 8.5 fl oz (8/6) Twinline EC 8.5 fl oz (8/21)	2.4 c	3.8	3.0 bc	5.4 c	5.8 c
Priaxor SC 4 fl oz (8/6) Priaxor SC 4 fl oz (8/21)	3.2 bc	3.4	4.0 bc	6.6 bc	5.8 c
Headline 2.08SC 6 fl oz (8/21)	3.2 bc	3.6	6.4 ab	14.4 b	10.0 b
Twinline EC 8.5 fl oz (8/21)	2.4 c	3.4	4.0 bc	8.0 bc	7.0 bc
Priaxor SC 4 fl oz (8/21)	3.0 bc	4.4	5.8 b	11.4 bc	6.6 bc
P(F)	**0.01**	0.94	**0.005**	**0.0006**	**0.0001**

[1] The first fungicide application was made 21 days after first bloom on 6 Aug; the second application was made 15 days later on 21 Aug.
[2] Percent leaf area with leaf spot complex (Cercospora, Stemphylium, Alternaria, etc.).
[3] Percent leaf area with Corynespora target spot. Target spot was not observed in the upper canopy on 6 Sep.
[4] Percent canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 60. Effect of treatment on disease severity of cotton, 22 Sep.

Treatment, rate/A and application date[1]	% foliar disease[2] (22 Sep)		% Target spot[3] (22 Sep)		% defoliation[4] (22 Sep)
	Upper canopy	Mid-canopy	Upper canopy	Mid-canopy	
Untreated check	8.8	2.0 a	7.0 a	36.0	44.0 a
Headline 2.08SC 6 fl oz (8/6)	8.4	1.6 ab	1.6 b	17.0	22.0 bc
Twinline EC 8.5 fl oz (8/6)	10.4	2.0 a	4.0 b	27.0	27.0 bc
Priaxor SC 4 fl oz (8/6)	8.2	1.6 ab	2.0 b	26.0	30.0 b
Headline 2.08SC 6 fl oz (8/6) Headline 2.08SC 6 fl oz (8/21)	6.4	1.2 b	2.8 b	22.0	27.0 bc
Twinline EC 8.5 fl oz (8/6) Twinline EC 8.5 fl oz (8/21)	6.8	1.2 b	1.4 b	22.0	30.0 b
Priaxor SC 4 fl oz (8/6) Priaxor SC 4 fl oz (8/21)	7.4	1.8 ab	1.4 b	16.0	17.0 c
Headline 2.08SC 6 fl oz (8/21)	8.2	1.2 b	2.4 b	22.0	26.0 bc
Twinline EC 8.5 fl oz (8/21)	7.4	2.0 a	2.2 b	22.0	23.0 bc
Priaxor SC 4 fl oz (8/21)	8.8	1.4 ab	1.4 b	17.0	24.0 bc
P(F)	0.21	**0.02**	**0.01**	0.09	**0.01**

[1] The first fungicide application was made 21 days after first bloom on 6 Aug; the second application was made 15 days later on 21 Aug.

[2] Percent leaf area with leaf spot complex (Cercospora, Stemphylium, Alternaria, etc.).

[3] Percent leaf area with Corynespora target spot. Most of the lower canopy was defoliated on 22 Sep.

[4] Percent canopy defoliated.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 61. Effect of treatments on earliness and yield of cotton.

Treatment, rate and application date[1]	Open bolls[2] (26 Sep)	Yield[3]	
		lb/A	bales/A
Untreated check	46.0	5092 c	5.0 c
Headline 2.08SC 6 fl oz (8/6)	43.6	5215 bc	5.1 bc
Twinline EC 8.5 fl oz (8/6)	38.2	5261 bc	5.1 bc
Priaxor SC 4 fl oz (8/6)	49.4	5191 bc	5.1 bc
Headline 2.08SC 6 fl oz (8/6) Headline 2.08SC 6 fl oz (8/21)	41.0	5508 ab	5.4 ab
Twinline EC 8.5 fl oz (8/6) Twinline EC 8.5 fl oz (8/21)	47.6	5689 a	5.6 a
Priaxor SC 4 fl oz (8/6) Priaxor SC 4 fl oz (8/21)	36.8	5213 bc	5.1 bc
Headline 2.08SC 6 fl oz (8/21)	40.6	5280 bc	5.2 bc
Twinline EC 8.5 fl oz (8/21)	42.4	5205 bc	5.1 bc
Priaxor SC 4 fl oz (8/21)	44.6	5280 bc	5.2 bc
P(F)	0.52	**0.05**	**0.05**

[1] The first fungicide application was made 21 days after first bloom on 6 Aug; the second application was made 15 days later on 21 Aug.

[2] Determined from counts in a 6-ft section of each row per plot.

[3] Weight (lb/A) includes lint + seed; bales/A are weight of lint only. Lint was 47.0% of weight and 480 lb/bale. Plots were harvested on 5 Nov.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XX. EVALUATION OF CULTIVAR RESISTANCE AND FUNGICIDES FOR DISEASE MANAGEMENT IN PEANUT (PVAR114, TAREC Research Farm, Field 9A)

A. PURPOSE: To assess the value of cultivar resistance and different fungicide chemistries in the management of foliar and soilborne diseases of peanut.

B. EXPERIMENTAL DESIGN:
1. Four randomized complete blocks separated by 10-ft alleys between blocks
2. Seeding rate of ca. 4 seed/ft of row
3. Split-plot design with treatments in sixteen-row, main plots and varieties in four-row, subplots.

C. APPLICATION OF TREATMENTS: In-furrow treatments (F) were applied to the two center rows of plots in a volume of 5 gal/A with a microtube to each seed furrow at planting on 5 May. Foliar sprays for leaf spot control were applied with three, $D_3$23 nozzles/row delivering 14.85 gal/A. The initial application was at beginning pod (R_3, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until beginning maturity (R_7). Whenever the Sclerotinia blight advisory (http://webipm.ento.vt.edu/cgi-bin/infonet1.cgi) called for a fungicide application, the fungicides in treatment list were applied according to the last effective spray date.

D. TREATMENT AND RATE/A:
1. Untreated
2. Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
3. Proline 480SC 5.7 fl oz (F)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
4. Omega 500F 1.0 pt (advisory spray)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)

E. CULTIVAR:
1. Bailey
2. CHAMPS
3. Wynne
4. Sullivan

F. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Corn 2013, cotton 2012, peanut 2010
3. Land preparation: rip and strip till
4. Planting date: 7 May
5. Soil fertility report: (Jan 2014)

pH.....	6.5	K	86 ppm
Ca	432 ppm	Zn.....	0.3 ppm
Mg	50 ppm	Mn.....	1.4 ppm
P.....	52 ppm	Soil type.....	Kenansville loamy fine sand

6. Herbicide:
   Pre-plant – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt
   + Prowl 1.0 pt (22 Apr)
   Pre-emergence – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt
   + Gramaxone Inteon 1.0 pt/A (8 May)
   Post-emergence – Select Max 2EC 1.0 pt with Induce 2 fl oz/A (11 Jun, 7 Jul)
7. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (7 May in-furrow)
   Orthene 97S 12 oz/A (27 May, 6 Jun)
   Belt 2 fl oz + Baythroid XL 2 fl oz/A (5 Sep)
8. Acaricide: Danitol 2.4EC 6 fl oz/A (29 Jul)
9. Additional crop management:
   a. Liquid boron 1.0 qt/A (22 Apr)
   b. ENC 1.0 qt/A (27 May, 6 Jun, 20 Jun)
   c. Manganese 1 qt/A (2 Jul, 29 Jul)
   d. Landplaster: Peanut Maker 1200 lbs/A (16 Jun)
10. Harvest date: 14 Oct

Table 62. Effect of treatment and cultivar on emergence and disease incidence of peanut.

Cultivar, treatment, rate/A and application date[1]	Plants/ft[2] (23 May)	Sclerotinia blight[3]		CBR[3]	
		29 Jul	2 Sep	29 Jul	2 Sep
Bailey					
Untreated	2.2	0.0	1.8	0.3	1.5
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.2	0.0	0.3	0.0	1.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.4	0.0	1.0	0.0	0.0
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.2	0.0	0.0	0.0	1.8
CHAMPS					
Untreated	3.1	0.5	2.3	0.0	10.3
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.2	0.0	0.5	0.5	9.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.4	0.3	1.8	0.3	7.8
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.1	0.0	0.5	0.0	3.5
Wynne					
Untreated	2.3	0.0	1.5	0.0	2.5
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.6	0.0	1.0	0.0	0.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.5	0.0	2.0	0.0	0.3
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.4	0.3	1.8	0.0	0.5
Sullivan					
Untreated	3.0	0.0	1.3	0.0	0.3
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.2	0.0	0.0	0.0	0.8
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.3	0.0	0.5	0.0	1.0
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.0	0.0	0.0	0.0	1.3
Split-plot analysis, P(F)					
Treatment	0.055	0.77	0.28	0.69	**0.02**
Cultivar	**0.0001**	0.28	0.26	0.28	**0.0001**
Treatment x cultivar	0.80	0.54	0.99	0.54	0.08
Cultivar means					
Bailey	2.2 c	0.0	0.8	0.1	1.1 b
CHAMPS	3.2 a	0.2	1.3	0.2	7.6 a
Wynne	2.4 b	0.1	1.6	0.0	0.9 b
Sullivan	3.1 a	0.0	0.4	0.0	0.8 b

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Determined from counts of two, 35-ft rows per plot. [3]Counts of infection centers in the two center rows of each plot or a total of 70 ft row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 63. Effect of treatment and cultivar on disease incidence and severity of peanut.

Cultivar, treatment, rate/A and application date[1]	% leaf spot[2]		% defoliation[3]	
	7 Sep	1 Oct	7 Sep	1 Oct
Bailey				
Untreated	92.0 a	92.5 a	15.0 a	88.8 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	25.0 b	80.0 a	5.0 b	20.0 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	26.3 b	77.5 ab	4.5 b	18.8 bc
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	28.8 b	60.0 b	5.0 b	7.5 c
CHAMPS				
Untreated	20.5 a	92.3 a	3.5 a	91.3 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.8 b	37.5 b	0.8 b	6.3 c
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	5.0 b	50.0 b	1.0 b	12.5 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.5 b	27.5 b	1.0 b	3.5 c
Wynne				
Untreated	26.8 a	93.8 a	3.5 a	50.0 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	10.0 a	46.3 b	2.0 a	6.8 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	10.8 a	37.5 b	2.0 a	5.5 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	8.5 a	25.0 b	2.0 a	2.0 b
Sullivan				
Untreated	10.3 a	95.0 a	1.5 a	17.5 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	5.3 b	25.0 b	0.6 a	2.0 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.8 b	32.5 b	0.6 a	2.0 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.3 b	21.3 b	0.8 a	2.5 b
Split-plot analysis, P(F)				
Treatment	**0.0006**	**0.0002**	**0.0002**	**0.0001**
Cultivar	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Treatment x cultivar	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Cultivar means				
Bailey	43.0 a	77.5 a	7.4 a	33.8 a
CHAMPS	8.4 c	51.8 b	1.6 bc	28.4 a
Wynne	14.0 b	50.6 b	2.4 b	16.1 b
Sullivan	5.6 c	43.4 c	0.8 c	6.0 c

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Percentage of total leaflets with early or late leaf spot lesions. [3] Percentage of total canopy defoliated. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 64. Effect of treatment and cultivar on disease severity and yield of peanut.

Cultivar, treatment, rate/A and application date[1]	Root disease[2] (6 Oct)	Pod rot[3] (6 Oct)	Yield[4] (lb/A)
Bailey			
Untreated	3.3	2.3	3085 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.5	2.3	5839 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.0	2.3	5847 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	1.8	1.3	5981 a
CHAMPS			
Untreated	5.3	4.0	2328 c
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.8	3.3	4117 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.5	3.0	3766 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.3	2.3	5805 a
Wynne			
Untreated	4.3	2.3	4943 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.5	1.8	6520 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.8	1.8	6462 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.0	1.8	6088 a
Sullivan			
Untreated	3.0	2.0	5659 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.3	1.3	6369 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	1.8	1.3	6648 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.8	1.8	6324 a
Split-plot analysis, P(F)			
Treatment	0.09	0.14	**0.0001**
Cultivar	**0.0001**	**0.0001**	**0.0001**
Treatment x cultivar	0.21	0.19	**0.0001**
Cultivar means			
Bailey	2.9 b	2.0 b	5188 b
CHAMPS	4.4 a	3.1 a	4004 c
Wynne	3.1 b	1.9 b	6003 a
Sullivan	2.4 b	1.6 b	6250 a

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Root disease includes Cylindrocladium black rot. Rating scale: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of roots decayed. [3]Pod rot index: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of pods decayed. [4]Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 6 Oct and harvested 14 Oct. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 65. Effect of treatment and cultivar on grade characteristics of peanut.

Cultivar, treatment, rate/A and application date[1]	%[2]								Value (¢/lb)[3]	
	FM	LSK	FAN	ELK	SS	OK	DK	SMK	100%	comm -ercial
Bailey										
Untreated	3.5	4.0	70.1	44.6	1.7	0.8	1.5 a	64.1	17.0	16.9
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	6.6	7.0	75.4	58.3	2.2	1.2	0.6 a	71.0	19.1	18.9
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.5	4.5	75.0	50.5	2.6	1.0	0.9 a	63.3	17.1	17.0
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	7.9	2.8	79.7	54.0	2.1	1.0	0.7 a	65.1	17.5	17.3
CHAMPS										
Untreated	6.2	2.6	79.9	52.2	1.5	0.9	1.0 a	69.0	18.3	18.1
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.9	2.8	82.1	55.2	1.3	1.2	0.5 a	64.1	17.1	17.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	12.2	8.6	81.5	51.1	2.0	1.1	1.7 a	63.0	16.9	16.1
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	15.2	7.2	85.0	53.6	1.3	1.3	0.8 a	63.9	17.1	16.1
Wynne										
Untreated	3.0	3.1	93.7	53.7	0.8	0.8	0.3b	61.1	16.2	16.2
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	5.9	3.1	93.9	62.1	1.2	0.7	1.6a	70.4	18.7	18.5
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	3.9	3.6	93.2	60.8	1.2	0.8	0.4b	67.5	18.0	18.0
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	5.8	3.1	90.0	53.4	1.0	1.3	0.6b	62.7	16.7	16.5
Sullivan										
Untreated	4.9	2.2	87.4	57.3	1.5	0.6	0.2 a	65.7	17.5	17.5
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	9.2	2.2	90.0	61.0	1.4	0.6	0.8 a	67.9	18.1	17.8
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	7.1	1.9	89.7	60.5	1.0	1.1	0.3 a	67.7	18.0	17.9
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	9.1	4.9	83.7	58.9	1.3	1.5	0.7 a	66.8	17.9	17.6
Split-plot analysis, P(F)										
Treatment	0.20	0.84	0.52	0.48	0.80	0.18	0.91	0.80	0.80	0.78
Cultivar	0.13	0.30	**0.0001**	**0.003**	**0.0009**	0.47	0.13	0.85	0.81	0.62
Treatment x cultivar	0.81	0.51	0.23	0.51	0.80	0.32	**0.01**	0.62	0.66	0.67
Cultivar means										
Bailey	5.6	4.6	75.1d	51.8b	2.1a	1.0	0.9	65.9	17.7	17.5
CHAMPS	9.6	5.3	82.1c	53.0b	1.5b	1.1	1.0	65.0	17.4	16.9
Wynne	4.6	3.2	92.7a	57.5a	1.0b	0.9	0.7	65.4	17.4	17.3
Sullivan	7.6	2.8	87.7b	59.4a	1.3b	1.0	0.5	67.0	17.9	17.7

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).
[2]FM=foreign material, LSK=loose shelled kernels, FAN=large pods, ELK=extra-large kernels, SS=sound splits, OK=other kernels, DK=damaged kernels, SMK=sound mature kernels.
[3]Value (¢/lb) represents the market value of peanuts based on the loan rate. The 100% column reports value without any deduction for segregation 2 peanuts. Commercial value includes the deduction for segregation 2 due to damaged kernels ≥ 2.5%; producers receive 35% of value for these peanuts. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

XXI. EVALUATION OF CULTIVAR RESISTANCE AND FUNGICIDES FOR DISEASE MANAGEMENT IN PEANUT (PVAR214, Tidewater AREC, Field 46A)

A. PURPOSE: To assess the value of cultivar resistance and different fungicide chemistries in the management of foliar and soilborne diseases of peanut.

B. EXPERIMENTAL DESIGN:
1. Four randomized complete blocks separated by 10-ft alleys between blocks
2. Seeding rate of ca. 4 seed/ft of row
3. Split-plot design with treatments in sixteen-row, main plots and varieties in four-row, subplots.

C. APPLICATION OF TREATMENTS: In-furrow treatments (F) were applied to the two center rows of plots in a volume of 5 gal/A with a microtube to each seed furrow at planting on 7 May. Foliar sprays for leaf spot control were applied with three, $D_3$23 nozzles/row delivering 14.85 gal/A. The initial application was at beginning pod (R_3, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until beginning maturity (R_7). Whenever the Sclerotinia blight advisory (http://webipm.ento.vt.edu/cgi-bin/infonet1.cgi) called for a fungicide application, the fungicides in treatment list were applied according to the last effective spray date.

D. TREATMENT AND RATE/A:
1. Untreated
2. Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
3. Proline 480SC 5.7 fl oz (F)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
4. Omega 500F 1.0 pt (advisory spray)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)

E. CULTIVAR:
1. Bailey
2. CHAMPS
3. Wynne
4. Sullivan

F. ADDITIONAL INFORMATION:
1. Location: Tidewater Agricultural Research and Extension Center, Holland Rd., Suffolk, VA
2. Crop history: Corn 2013, cotton 2012, peanut 2010
3. Land preparation: rip and strip till
4. Planting date: 7 May
5. Soil fertility report: (Jan 2014)

pH	6.4	K	184 ppm
Ca	749 ppm	Zn	0.4 ppm
Mg	61 ppm	Mn	1.7 ppm
P	62 ppm	Soil type	Nansemond fine sandy loam

6. Herbicide:
   Pre-plant – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt
   + Prowl 1.0 pt (27 Apr)
   Pre-emergence – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt
   + Gramaxone Inteon 1.0 pt/A (8 May)
   Post-emergence – Select 2EC 1.0 pt with Induce 2 fl oz/A (2 Jul)
7. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (7 May in-furrow)
   Orthene 97S 12 oz/A (27 May, 6 Jun)
8. Acaricide: Danitol 2.4EC 6 fl oz/A (29 Jul)
9. Additional crop management:
   a. Liquid boron 1.0 qt/A (22 Apr)
   b. ENC 1.0 qt/A (27 May, 6 Jun, 20 Jun)
   c. Manganese 1 qt/A (2 Jul, 29 Jul)
   d. Landplaster: Peanut Maker 1200 lbs/A (16 Jun)
10. Harvest date: 14 Oct

Table 66. Effect of treatments on emergence and disease incidence of peanut.

Cultivar, treatment, rate/A and application date[1]	Plants/ft[2] (27 May)	Sclerotinia blight[3]		CBR[3]	
		25 Jul	4 Sep	25 Jul	4 Sep
Bailey					
Untreated	2.3	0.5	4.8	0.0	4.5
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.3	0.0	5.8	0.0	2.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.3	1.3	10.8	0.0	2.5
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.4	1.8	5.0	0.0	4.3
CHAMPS					
Untreated	3.0	3.3	8.0	6.5	23.0
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.2	4.8	15.5	4.5	15.8
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.9	3.5	11.8	6.8	21.5
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.8	6.8	10.8	4.5	22.0
Wynne					
Untreated	2.4	0.8	13.8	0.0	2.3
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.4	4.5	14.8	0.0	4.8
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.4	0.8	9.5	0.0	2.8
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.3	0.8	6.3	0.0	3.0
Sullivan					
Untreated	3.0	0.3	9.3	0.3	3.0
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.9	1.8	6.5	0.0	2.5
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.9	1.5	6.3	0.0	1.5
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.0	1.5	3.8	0.3	3.3
Split-plot analysis, P(F)					
Treatment	0.94	0.54	0.52	0.85	0.50
Cultivar	**0.0001**	**0.0001**	**0.008**	**0.0001**	**0.0001**
Treatment x cultivar	0.49	**0.04**	0.28	1.0	0.90
Cultivar means					
Bailey	2.3 b	0.9 b	6.6 b	0.0 b	3.4 b
CHAMPS	3.0 a	4.6 a	11.5 a	5.6 a	20.6 a
Wynne	2.4 b	1.7 b	11.1 a	0.0 b	3.2 b
Sullivan	2.9 a	1.3 b	6.4 b	0.1 b	2.6 b

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Determined from counts of two, 35-ft rows per plot. [3]Counts of infection centers in the two center rows of each plot or a total of 70 ft row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point. Means in a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 67. Effect of treatments on disease incidence and severity of peanut.

Cultivar, treatment, rate/A and application date[1]	% leaf spot[2]		% defoliation[3]	
	30 Aug	20 Sep	30 Aug	20 Sep
Bailey				
Untreated	3.5	51.8 a	0.0	4.8 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.8	6.5 b	0.0	1.0 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.8	6.0 b	0.0	1.3 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.0	6.0 b	0.0	0.5 b
CHAMPS				
Untreated	2.0	18.8 a	0.0	2.5 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.0	2.8 a	0.0	1.0 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.5	4.3 a	0.0	1.3 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.5	5.8 a	0.0	1.3 a
Wynne				
Untreated	3.8	18.0 a	0.0	2.3 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	4.0	5.8 b	0.0	1.3 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	4.0	6.5 ab	0.0	1.3 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.0	7.8 ab	0.0	1.3 a
Sullivan				
Untreated	1.8	21.5 a	0.0	1.8 a
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.5	4.0 a	0.0	0.8 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.8	2.5 a	0.0	0.5 a
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.3	3.0 a	0.0	1.0 a
Split-plot analysis, P(F)				
Treatment	0.13	**0.04**	- -	0.05
Cultivar	**0.0001**	**0.0007**	- -	0.08
Treatment x cultivar	0.28	**0.0002**	- -	**0.03**
Cultivar means				
Bailey	2.5 b	17.6 a	0.0	1.9
CHAMPS	1.8 c	7.9 b	0.0	1.5
Wynne	3.7 a	9.5 b	0.0	1.5
Sullivan	1.6 c	7.8 b	0.0	1.0

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Percentage of total leaflets with early or late leaf spot lesions. [3] Percentage of total canopy defoliated. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 68. Effect of treatments on disease severity and yield of peanut.

Cultivar, treatment, rate/A and application date[1]	Root disease[2] (6 Oct)	Pod rot[3] (6 Oct)	Yield[4] (lb/A)
Bailey			
Untreated	3.8 a	1.3	5527 ab
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.5 a	1.8	5605 ab
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.8 a	1.8	5285 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.0 a	1.3	6325 a
CHAMPS			
Untreated	5.8 a	3.0	2216 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	5.5 a	2.8	2058 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	5.8 a	2.8	1898 b
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	4.8 a	2.5	3177 a
Wynne			
Untreated	4.3 a	2.0	4915 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	4.3 a	1.8	4434 b
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.8 a	2.0	5582 ab
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.5 b	1.0	6222 a
Sullivan			
Untreated	3.3 a	1.5	5326 b
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	2.3 ab	1.0	5836 ab
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	3.5 a	1.5	6126 ab
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	1.3 b	1.0	7093 a
Split-plot analysis, P(F)			
Treatment	**0.01**	0.07	**0.004**
Cultivar	**0.0001**	**0.0001**	**0.0001**
Treatment x cultivar	0.59	0.65	0.41
Cultivar means			
Bailey	3.5 b	1.5 bc	5685 ab
CHAMPS	5.4 a	2.8 a	2337 c
Wynne	3.7 b	1.7 b	5288 b
Sullivan	2.6 c	1.3 c	6095 a

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Root disease includes Cylindrocladium black. Rating scale: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of roots decayed. [3]Pod rot index: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of pods decayed. [4]Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 6 Oct and harvested 14 Oct. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 69. Effect of treatment and cultivar on grade characteristics of peanut.

Cultivar, treatment, rate/A and application date[1]	%[2]								Value (¢/lb)[3]	
	FM	LSK	FAN	ELK	SS	OK	DK	SMK	100%	comm -ercial
Bailey										
Untreated	8.3	2.2	78.4	52.4	2.1	0.9	2.4	65.5	17.6 a	17.1
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	8.5	3.7	83.1	51.3	2.2	0.8	1.8	60.6	16.4 a	16.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	6.4	2.9	80.7	43.8	1.0	0.7	1.9	54.5	14.4 a	14.1
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	7.5	3.1	77.5	48.8	2.4	0.9	1.5	59.4	16.1 a	15.7
CHAMPS										
Untreated	8.4	6.3	74.9	52.8	1.1	1.0	2.3	70.6	18.6 a	18.1
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	8.8	4.7	78.5	48.5	0.7	1.1	2.9	65.5	17.2 a	16.6
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	7.8	5.4	79.4	50.1	1.0	1.1	3.2	65.7	17.4 a	16.6
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	12.1	4.9	76.4	55.2	1.5	1.3	1.5	70.6	18.8 a	18.1
Wynne										
Untreated	7.4	3.7	93.2	55.3	0.9	0.6	1.2	63.2	16.8b	16.4
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	5.8	3.1	93.7	50.4	1.2	0.6	2.9	57.2	15.3b	14.8
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	8.5	4.2	89.6	63.8	1.3	0.7	1.5	73.8	19.6a	19.2
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	6.5	2.5	93.4	52.8	0.9	0.6	0.8	59.2	15.7b	15.6
Sullivan										
Untreated	7.5	2.2	84.8	48.1	1.0	0.6	1.5	56.0	14.9 a	14.6
Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	9.2	3.3	86.4	54.3	1.7	0.6	1.8	62.2	16.7 a	16.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	9.6	2.3	85.6	55.1	1.4	0.7	1.4	63.3	16.9 a	16.5
Omega 500F 1 pt (7/28, 9/5) Provost 433SC 10.7 fl oz 7/14, 8/5, 8/28) Bravo 720 1.5 pt (9/15)	10.3	2.4	83.5	55.3	1.5	0.8	1.2	63.5	17.0 a	16.6
Split-plot analysis, P(F)										
Treatment	0.23	0.40	0.25	0.79	0.45	0.81	0.22	0.70	0.78	0.76
Cultivar	**0.01**	**0.0001**	**0.0001**	**0.04**	**0.004**	**0.0001**	0.14	**0.02**	0.07	0.14
Treatment x cultivar	0.11	0.06	0.73	**0.047**	0.18	0.90	0.76	0.05	**0.046**	0.06
Cultivar means										
Bailey	7.7bc	3.0bc	79.9c	49.1b	1.9a	0.8b	1.9	60.0b	16.1	15.8
CHAMPS	9.2a	5.3a	77.3c	51.6ab	1.1b	1.1a	2.5	68.1a	18.0	17.4
Wynne	7.0c	3.4b	92.4a	55.6a	1.1b	0.6b	1.6	63.3ab	16.8	16.5
Sullivan	9.1ab	2.5c	85.1b	53.2ab	1.4b	0.7b	1.5	61.2b	16.4	16.0

[1]F=in-furrow (7 May). Foliar fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).
[2]FM=foreign material, LSK=loose shelled kernels, FAN=large pods, ELK=extra-large kernels, SS=sound splits, OK=other kernels, DK=damaged kernels, SMK=sound mature kernels.
[3]Value (¢/lb) represents the market value of peanuts based on the loan rate. The 100% column reports value without any deduction for segregation 2 peanuts. Commercial value includes the deduction for segregation 2 due to damaged kernels ≥ 2.5%; producers receive 35% of value for these peanuts. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

XXII. EVALUATION OF CULTIVAR RESISTANCE AND FUNGICIDES FOR DISEASE MANAGEMENT IN PEANUT (PVAR314, Orton Farm, Dinwiddie Co.)

A. PURPOSE: To assess the value of cultivar resistance and different fungicide chemistries in the management of foliar and soilborne diseases of peanut.

B. EXPERIMENTAL DESIGN:
1. Four randomized complete blocks separated by 10-ft alleys between blocks
2. Seeding rate of ca. 4 seed/ft of row
3. Split-plot design with treatments in sixteen-row, main plots and varieties in four-row, subplots.

C. APPLICATION OF TREATMENTS: In-furrow treatments (F) were applied to the two center rows of plots in a volume of 5 gal/A with a microtube to each seed furrow at planting on 15 May. Foliar sprays for leaf spot control were applied with three, $D_3$23 nozzles/row delivering 14.85 gal/A. The initial application was at beginning pod (R_3, 23 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until beginning maturity (R_7). Whenever the Sclerotinia blight advisory (http://webipm.ento.vt.edu/cgi-bin/infonet1.cgi) called for a fungicide application, the fungicides in treatment list were applied according to the last effective spray date (8 Aug, 16 Sep).

D. TREATMENT AND RATE/A:
1. Untreated
2. Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
3. Proline 480SC 5.7 fl oz (F)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
4. Omega 500F 1.0 pt (advisory spray)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)

E. CULTIVAR:
1. Bailey
2. CHAMPS
3. Wynne
4. Sullivan

F. ADDITIONAL INFORMATION:
1. Location: Johnny Orton Farm, 17408 Pelican Park, Carson, VA
2. Crop history: Corn 2013, wheat/soybean 2012
3. Planting date: 15 May
4. Soil fertility report: (15 May 2014)

pH	7.09	K	69 ppm
Ca	497 ppm	Zn	0.7 ppm
Mg	86 ppm	Mn	4.5 ppm
P	19 ppm	Soil type	Nansemond fine sandy loam

5. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (9 May in-furrow)
6. Harvest date: 28 Oct

Table 70. Effect of treatment and cultivar on emergence and disease incidence of peanut.

Cultivar, treatment, rate/A and application date[1]	Plants/ft[2] (6 Jun)	Sclerotinia blight[3]			CBR[3]	
		28 Aug	16 Sep	4 Oct	16 Sep	4 Oct
Bailey						
Untreated	2.0	1.0	1.8	4.3	0.0	0.0
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.3	0.5	0.8	3.3	0.0	0.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.1	0.0	0.8	2.5	0.0	0.0
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (6/16)	2.2	0.0	0.3	1.0	0.0	0.3
CHAMPS						
Untreated	2.6	1.8	2.5	6.8	0.0	0.0
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.3	2.3	2.3	8.0	0.3	0.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.4	2.8	3.8	6.5	0.0	0.3
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.8	0.8	1.0	6.5	0.0	0.5
Wynne						
Untreated	2.0	1.5	2.0	5.3	0.0	0.3
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.1	0.3	1.5	3.8	0.0	0.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.2	1.0	1.8	5.3	0.0	0.0
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.1	0.5	1.0	2.0	0.0	0.0
Sullivan						
Untreated	2.7	0.8	1.5	4.0	0.0	0.0
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.6	0.8	1.3	4.3	0.5	0.3
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.7	0.5	1.3	3.0	0.0	0.0
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.6	2.0	2.3	3.3	0.0	0.0
Split-plot analysis,* P*(F)						
Treatment	0.93	0.75	0.50	0.35	0.13	0.72
Cultivar	**0.0001**	**0.002**	**0.02**	**0.0001**	0.14	0.77
Treatment x cultivar	0.19	0.07	0.34	0.67	0.08	0.59
Cultivar means						
Bailey	2.2 b	0.4 b	0.9 b	2.8 b	0.0	0.1
CHAMPS	2.5 a	1.9 a	2.4 a	6.9 a	0.1	0.2
Wynne	2.1 b	0.8 b	1.6 ab	4.1 b	0.0	0.1
Sullivan	2.6 a	1.0 b	1.6 ab	3.6 b	0.1	0.1

[1] F=in-furrow (15 May). Foliar fungicides were applied at R_3 (beginning pod, 23 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Determined from counts of two, 35-ft rows per plot. [3]Counts of infection centers in the two center rows of each plot or a total of 70 ft of row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point. Means in a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 71. Effect of treatment and cultivar on disease incidence/severity and yield of peanut.

Cultivar, treatment, rate/A and application date[1]	% leaf spot[2]		% defoliation[3]	Yield[4]
	10 Sep	4 Oct	(4 Oct)	lb/A
Bailey				
Untreated	3.0	2.8 a	1.3	4987
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.5	2.0 a	1.3	4841
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.5	1.8 a	1.0	5085
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (6/16)	2.5	1.0 a	1.0	5093
CHAMPS				
Untreated	2.0	1.5 a	1.0	5434
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.5	1.3 a	1.0	5278
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.3	1.5 a	1.0	5563
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.3	1.3 a	1.0	5034
Wynne				
Untreated	2.8	1.5 ab	1.0	5553
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	3.3	2.0 ab	1.0	4979
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	3.8	1.3 b	1.0	5763
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	3.3	2.8 a	1.0	5307
Sullivan				
Untreated	2.3	1.5 a	1.0	5842
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	1.8	1.3 a	1.0	5895
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	1.5	1.0 a	1.0	5105
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	2.3	1.3 a	1.0	5590
Split-plot analysis,* P*(F)				
Treatment	0.99	0.76	0.44	0.58
Cultivar	**0.0001**	**0.02**	0.13	**0.03**
Treatment x cultivar	0.48	**0.02**	0.73	0.30
Cultivar means				
Bailey	2.6 b	1.9 a	1.1	5001 b
CHAMPS	2.3 bc	1.4 b	1.0	5328 ab
Wynne	3.3 a	1.9 a	1.0	5400 a
Sullivan	1.9 c	1.3 b	1.0	5608 a

[1] F=in-furrow (15 May). Foliar fungicides were applied at R_3 (beginning pod, 23 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]Percentage of total leaflets with early or late leaf spot lesions. [3] Percentage of total canopy defoliated. [4]Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 10 Oct and harvested 28 Oct. Means in a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

Table 72. Effect of treatment and cultivar on grade characteristics of peanut.

Cultivar, treatment, rate/A and application date[1]	%[2]								Value (¢/lb)[3]	
	FM	LSK	FAN	ELK	SS	OK	DK	SMK	100%	comm -ercial
Bailey										
Untreated	6.6	1.6	71.7	41.5	5.7	1.1	0.6	51.8	14.9	14.8
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	7.4	1.3	72.9	43.3	5.7	1.0	0.3	52.7	15.2	15.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	6.1	1.5	74.0	43.6	4.5	1.6	0.6	52.5	14.9	14.7
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (6/16)	6.2	1.6	73.4	43.7	5.2	1.1	0.5	52.8	15.1	14.9
CHAMPS										
Untreated	7.2	2.2	80.6	45.7	3.1	0.8	0.7	54.3	15.0	14.8
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	5.8	1.5	83.6	45.6	3.3	1.1	0.8	54.6	15.1	15.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	7.1	1.7	80.0	44.0	3.7	0.9	1.4	53.3	14.8	14.6
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	5.3	1.4	85.5	45.8	3.1	0.8	1.0	54.6	15.0	14.9
Wynne										
Untreated	6.2	2.1	89.1	47.1	4.2	0.9	0.7	53.5	15.1	14.9
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	5.7	2.2	87.4	46.4	3.9	0.9	0.9	54.0	15.1	15.0
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	5.7	1.3	89.9	47.0	3.8	0.8	0.5	53.6	15.0	14.9
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	5.3	1.6	88.2	45.0	3.9	0.9	0.6	53.4	14.9	14.8
Sullivan										
Untreated	7.5	0.9	77.4	45.9	4.6	1.0	0.2	53.8	15.2	15.0
Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	7.4	0.9	76.5	44.6	4.9	0.9	0.6	53.2	15.1	14.9
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	6.4	1.5	77.2	45.3	4.6	0.9	0.6	52.8	15.0	14.8
Omega 500F 1 pt (8/8, 9/16) Provost 433SC 10.7 fl oz (7/23, 8/8, 8/28) Bravo 720 1.5 pt (9/16)	7.0	0.9	75.0	44.4	5.7	0.8	0.4	52.8	15.2	15.0
Split-plot analysis,* P*(F)										
Treatment	0.46	0.74	0.96	0.98	0.81	0.75	0.10	0.59	0.36	0.36
Cultivar	**0.04**	**0.003**	**0.0001**	**0.0001**	**0.0001**	0.08	**0.02**	**0.006**	0.46	0.56
Treatment x cultivar	0.58	0.20	0.39	0.10	0.72	0.57	0.49	0.90	0.96	0.93
Cultivar means										
Bailey	6.6ab	1.5a	73.0d	43.0c	5.3a	1.2	0.5b	52.4c	15.0	14.8
CHAMPS	6.3ab	1.7a	82.4b	45.3ab	3.3b	0.9	1.0a	54.2a	15.0	14.8
Wynne	5.7b	1.8a	88.7a	46.4a	3.9b	0.9	0.7ab	53.6ab	15.0	14.9
Sullivan	7.1a	1.0b	76.5c	45.0b	5.0a	0.9	0.5b	53.1bc	15.1	14.9

[1]F=in-furrow (15 May). Foliar fungicides were applied at R_3 (beginning pod, 23 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity). [2]FM=foreign material, LSK=loose shelled kernels, FAN=large pods, ELK=extra-large kernels, SS=sound splits, OK=other kernels, DK=damaged kernels, SMK=sound mature kernels. [3]Value (¢/lb) represents the market value of peanuts based on the loan rate. The 100% column reports value without any deduction for segregation 2 peanuts. Commercial value includes the deduction for segregation 2 due to damaged kernels ≥ 2.5%; producers receive 35% of value for these peanuts. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05).

XXIII. COMPARISON OF IN-FURROW APPLICATIONS OF TEMIK 15G AND NEW CHEMISTRIES FOR CONTROL OF NEMATODES AND SOILBORNE DISEASES OF PEANUT (PNEMA114, TAREC Research Farm, Field 29)

A. PURPOSE: To compare new chemistries for improved control of nematodes and diseases in peanut.

B. EXPERIMENTAL DESIGN:
1. Four, randomized complete blocks separated by 10-ft alleyways
2. Two, 35-ft rows per plot with 36 in. row spacing and 3 to 4 seed/ft of row
3. Split-plot design with main plots (varieties) of eight rows and subplots (treatments) of two rows spaced 36 in. apart

C. APPLICATION OF TREATMENTS: F = in seed furrow at planting either as granules delivered by a Noble Box or liquid mixed with water to make a volume of 5 gal/A and delivered through microtubes (9 May).

D. TREATMENT, RATE/A (F):
1. Untreated
2. Temik 15G 7 lb
3. Velum Total 440SC 14 fl oz
4. Velum Total 440SC 18 fl oz
5. Burkholderia 10 lb

E. CULTIVAR:
1. CHAMPS
2. Bailey

F. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: 2013 wheat/soybean, 2012 peanut, 2011 wheat/soybean
3. Land preparation: strip tillage
4. Planting date: 9 May
5. Soil fertility report (Jan 2014):

pH	6.93	K.....	47 ppm
Ca.....	319 ppm	Zn	0.3 ppm
Mg.....	40 ppm	Mn	2.0 ppm
P	19 ppm	Soil type	Kenansville loamy fine sand

6. Nematode assay report: (12 May)

Nematodes/500 cc soil	
Root knot	160
Stunt.....	80
Ring	20
Stubby root.....	20

7. Herbicide:
   Pre-plant – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Prowl 1.0 pt (25 Apr)
   Pre-emergence – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Gramaxone Inteon 1.0 pt/A (8 May)
8. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (9 May, in-furrow)
   Orthene 75S 12 oz/A (27 May, 6 Jun)
9. Acaricide: Danitol 2.4EC 6 fl oz/A (29 Jul)
10. Leaf spot control: Provost 9 fl oz/A (12 Jul, 8 Aug)
    Provost 9 fl oz + Omega 1.0 pt/A (25 Aug)
    Bravo 1.5 pt/A (15 Sep)
11. Additional crop management:
    a. Liquid boron 1.0 qt/A (23 Apr)
    b. ENC 1.0 qt/A (27 May, 6 Jun, 20 Jun)
    c. Liquid manganese 1.0 qt/A (2 Jul)
    d. Landplaster: Peanut Maker 1200 lb/A (16 Jun)
    e. Irrigation: ca. 1" (31 Jul)
12. Harvest date: 14 Oct

Table 73. Effect of treatments on emergence, plant health, thrips injury, and disease of peanut.

Cultivar, treatment, and rate/A (F)[1]	Plants/ft[2] (30 May)	% vigor[3] (2 Jun)	Thrips injury[4]		% leaf spot[5] (7 Sep)
			30 May	6 Jun	
CHAMPS					
Untreated	3.3	97.5	0.5 a	0.8 a	2.8
Temik 15G 7 lb	3.3	97.0	0.5 a	0.5 b	3.3
Velum Total 440SC 14 fl oz	3.3	97.0	0.5 a	0.3 c	2.0
Velum Total 440SC 18 fl oz	3.1	96.8	0.3 b	0.3 c	3.0
Burkholderia 10 lb	3.1	98.3	0.6 a	0.6 ab	3.0
Bailey					
Untreated	3.0	97.0	0.6 a	0.8 a	2.8
Temik 15G 7 lb	3.1	96.5	0.5 a	0.4 b	3.0
Velum Total 440SC 14 fl oz	2.9	94.5	0.5 a	0.3 c	3.3
Velum Total 440SC 18 fl oz	3.0	95.8	0.3 b	0.3 c	3.0
Burkholderia 10 lb	3.2	97.0	0.5 a	0.6 b	2.8
***Split-plot analysis, P*(F)**					
Variety	0.13	0.43	1.0	0.70	0.52
Treatment	0.57	0.87	**0.0001**	**0.0001**	0.59
Variety × treatment	0.12	0.98	0.32	0.93	0.16
Variety mean					
CHAMPS	3.2	97.3	0.5	0.5	2.8
Bailey	3.0	96.2	0.5	0.5	3.0
Treatment mean					
Untreated	3.2	97.3	0.5 a	0.8 a	2.8
Temik 15G 7 lb	3.2	96.8	0.5 a	0.5 c	3.1
Velum Total 440SC 14 fl oz	3.1	95.8	0.5 a	0.3 d	2.6
Velum Total 440SC 18 fl oz	3.0	96.3	0.3 b	0.3 d	3.0
Burkholderia 10 lb	3.1	97.6	0.5 a	0.6 b	2.9

[1] F=in furrow (9 May)
[2] Determined from counts of two, 35-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
[4] Thrips injury rating scale: 0=no damage, 10=dead plants.
[5] Percentage of total leaflets with early or late leaf spot lesions.
Means within a column and group followed by the same letter(s) are not significantly different at *P*=0.05 according to Fisher's Protected LSD.

Table 74. Effect of treatments on disease incidence, root galling, disease severity, and yield of peanut.

Variety, treatment, and rate/A (F)[1]	CBR[2] (2 Oct)	Sclero-tinia[2] (2 Oct)	Root knot gall index[3] (3 Oct)	Root disease[4] (3 Oct)	Pod rot[5] (3 Oct)	Yield[6] (lb/A)
CHAMPS						
Untreated	4.0	20.8	2.5	3.3 b	3.5	4322
Temik 15G 7 lb	5.0	17.5	2.3	3.8 ab	3.3	3439
Velum Total 440SC 14 fl oz	4.8	18.5	2.0	4.0 ab	3.3	3956
Velum Total 440SC 18 fl oz	4.8	22.0	2.5	4.8 a	3.3	4375
Burkholderia 10 lb	6.0	15.8	1.8	3.3 b	2.3	3764
Bailey						
Untreated	2.3	9.8	1.8	2.5 a	1.3	5333
Temik 15G 7 lb	1.0	13.3	1.8	2.5 a	1.5	5039
Velum Total 440SC 14 fl oz	1.5	9.0	1.5	1.8 ab	1.3	5609
Velum Total 440SC 18 fl oz	1.0	9.5	1.8	1.3 b	1.0	4566
Burkholderia 10 lb	1.0	8.3	1.5	1.8 ab	1.5	5009
***Split-plot analysis, P*(F)**						
Variety	0.07	0.24	0.12	0.07	**0.01**	**0.04**
Treatment	0.89	0.50	0.51	0.52	0.47	0.12
Variety x treatment	0.16	0.47	0.95	**0.01**	0.12	0.05
Variety mean						
CHAMPS	4.9	18.9	2.2	3.8	3.1 a	3971 b
Bailey	1.4	10.0	1.7	2.0	1.3 b	5111 a
Treatment mean						
Untreated	3.1	15.3	2.1	2.9	2.4	4828
Temik 15G 7 lb	3.0	15.4	2.0	3.1	2.4	4239
Velum Total 440SC 14 fl oz	3.1	13.8	1.8	2.9	2.3	4782
Velum Total 440SC 18 fl oz	2.9	15.8	2.1	3.0	2.1	4471
Burkholderia 10 lb	3.5	12.0	1.6	2.5	1.9	4387

[1] F=in furrow (9 May).

[2] Counts of infection centers in the two centers rows of each plot or a total of 70 ft row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point.

[3] Root knot nematode galling scale: 0=none, 6=100% of roots with galls.

[4] Root disease includes Cylindrocladium black rot and Southern stem rot. Rating scale: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of roots decayed.

[5] Pod rot index: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of pods decayed.

[6] Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 2 Oct and harvested 13 Oct. Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XXIV. EVALUATION OF IN-FURROW, EMERGENCE, AND FOLIAR FUNGICIDE SPRAYS FOR CONTROL OF LEAF SPOT AND SOILBORNE DISEASES OF PEANUT (CBRLFSPOT114, TAREC Research Farm, Suffolk, Field 29)

A. PURPOSE: To compare efficacy of in-furrow, emergence, and foliar applications of fungicides for control of leaf spots, Cylindrocladium black rot (CBR) and other soilborne diseases

B. EXPERIMENTAL DESIGN:
1. Four randomized complete blocks separated by 10-ft alleys between blocks
2. Seeding rate of ca. 4 seed/ft of row
3. Four, 35-ft rows per plot with treatments applied to the two center rows.

C. APPLICATION OF TREATMENTS: In-furrow treatments (F) were applied to the two center rows of plots in a volume of 5 gal/A with a microtube to each seed furrow at planting on 7 May. Treatments at 100% emergence (E) were applied on 28 May with two, 8004E nozzles per row at 19.5 gal/A in an 8-in. band over rows. Foliar sprays for leaf spot control were applied with three, $D_3$23 nozzles/row delivering 14.85 gal/A. The initial application was at beginning pod (R_3, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until beginning maturity (R_7).

D. TREATMENT AND RATE/A:
1. Untreated
2. Proline 480SC 5.7 fl oz (F)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
3. Proline 480SC 5.7 fl oz (E)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
4. Propulse 400SC 13.69 fl oz (F)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
5. Velum Total 18 fl oz (F)
   Propulse 400SC 13.69 fl oz (E)
   Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)
6. Provost 433SC 10.7 fl oz (R_3, 2nd, 3rd spray)
   Bravo 720 1.5 pt (4th spray)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history:
3. Land preparation: rip and strip till
4. Planting date and variety: 7 May, Sugg
5. Soil fertility report (Jan 2014):

pH	6.93	K.....	47 ppm
Ca.....	319 ppm	Zn	0.3 ppm
Mg.....	40 ppm	Mn	2.0 ppm
P	19 ppm	Soil type	Kenansville loamy fine sand

6. Herbicide:
   Pre-plant – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Prowl 1.0 pt (25 Apr)
   Pre-emergence – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Gramaxone Inteon 1.0 pt/A (8 May)
7. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (9 May, in-furrow)
   Orthene 75S 12 oz/A (27 May, 6 Jun)
8. Acaricide: Danitol 2.4EC 6 fl oz/A (29 Jul)
9. Additional crop management:
   a. Liquid boron 1.0 qt/A (23 Apr)
   b. ENC 1.0 qt/A (27 May, 6 Jun, 20 Jun)
   c. Landplaster: Peanut Maker 1200 lb/A (16 Jun)
   d. Irrigation: ca. 1" (31 Jul)
10. Harvest date: 13 Oct

Table 75. Effect of treatments on phytotoxicity and disease of peanut.

Treatment, rate/A and application method/date[1]	**% phyto-toxicity[2] (23 May)**	**% leaf spot[3]**		**% defoliation[4]**	
		7 Sep	**1 Oct**	**7 Sep**	**1 Oct**
Untreated	0.5	32.5 a	86.3 a	4.0 a	20.0 a
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.8	5.5 b	9.3 b	0.6 b	1.5 b
Proline 480SC 5.7 fl oz (E) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	0.5	4.5 b	8.0 b	0.3 b	1.5 b
Propulse 400SC 13.69 fl oz (F) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	1.5	4.5 b	7.5 b	0.1 b	1.0 b
Velum Total 18 fl oz (F) Propulse 400SC 13.69 fl oz (E) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	2.3	5.5 b	8.0 b	0.1 b	1.5 b
Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	0.3	5.5 b	11.3 b	0.6 b	1.8 b
P(F)	0.25	**0.0001**	**0.0001**	**0.0001**	**0.0001**

[1] F = in-furrow; E = band application at full emergence (28 May); fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).
[2] Percent total plants with phytotoxicity symptoms.
[3] Percentage of total leaflets with early or late leaf spot lesions.
[4] Percentage of total canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 76. Effect of treatments on disease incidence, root galling, disease severity, and yield of peanut.

Treatment, rate/A and application method/date[1]	CBR[2] (2 Oct)	Sclero-tinia[2] (2 Oct)	Root knot gall index[3] (3 Oct)	Root disease[4] (3 Oct)	Pod rot[5] (3 Oct)	Yield[6] (lb/A)
Untreated	6.8	5.3	1.3	2.5	2.0	4819
Proline 480SC 5.7 fl oz (F) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.3	6.8	1.8	2.5	2.0	5501
Proline 480SC 5.7 fl oz (E) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	6.3	6.0	2.3	2.5	1.8	4993
Propulse 400SC 13.69 fl oz (F) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	5.0	6.8	1.5	2.5	2.0	5397
Velum Total 18 fl oz (F) Propulse 400SC 13.69 fl oz (E) Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	6.3	9.8	1.0	2.3	1.8	5657
Provost 433SC 10.7 fl oz (R_3, 8/5, 8/25) Bravo 720 1.5 pt (9/15)	4.3	7.5	1.8	2.3	1.5	5561
P(F)	0.49	0.71	0.22	0.98	0.90	0.09

[1] F = in-furrow; E = band application at full emergence (28 May); fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).

[2] Counts of infection centers in the two centers rows of each plot or a total of 70 ft row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point.

[3] Root knot nematode galling index: 0=none, 6=100% of roots with galls.

[4] Root disease includes Cylindrocladium black rot and Southern stem rot. Rating scale: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of roots decayed.

[5] Pod rot index: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of pods decayed.

[6] Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 2 Oct and harvested 13 Oct.

XXV. EVALUATION OF FUNGICIDE TIMINGS FOR CONTROL OF LEAF SPOT AND SOILBORNE DISEASES OF PEANUT (LFSPOT114, TAREC Research Farm, Field 9A)

A. PURPOSE: To compare efficacy of registered and experimental fungicides for control of leaf spots and soilborne diseases in peanut.

B. EXPERIMENTAL DESIGN:
1. Four randomized complete blocks with 10-ft alleys between blocks
2. Four, 35-ft rows per plot with treatments applied to the two center rows
3. Seeding rate of ca. 4 seed/ft of row

C. APPLICATION OF TREATMENTS: Treatments at 100% emergence (E) were applied on 28 May with two, 8004E nozzles per row at 19.5 gal/A in an 8-in. band over rows. Foliar sprays were applied with three, $D_3$23 nozzles/row delivering 14.85 gal/A. The initial spray was at beginning pod (R_3, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until beginning maturity (R_7).

D. TREATMENT AND RATE/A:
1. Untreated check
2. Tilt/Bravo 4.3SC 1.5 pt (R_3)
   A18126WG 7.14 oz ($2^{nd,}$ 4^{th} spray)
   Bravo Weather Stik 1.5 pt (3^{rd} spray)
3. Tilt/Bravo 4.3SC 1.5 pt (R_3)
   A18126WG 9.5 oz ($2^{nd,}$ 4^{th} spray)
   Bravo Weather Stik 1.5 pt (3^{rd} spray)
4. Bravo Weather Stik 1.5 pt (R_3)
   A18126WG 7.14 oz (2^{nd}, 3^{rd}, 4^{th} spray)
5. Bravo Weather Stik 1.5 pt (R_3)
   Provost 3.6SC 8 fl oz (2^{nd}, 3^{rd}, 4^{th} spray)
6. Tilt/Bravo 4.3SC 1.5 pt (R_3)
   Fontelis 1.67SC 1 pt (2^{nd}, 3^{rd}, 4^{th} spray)
7. Tilt/Bravo 4.3SC 1.5 pt (R_3, 3^{rd})
   Abound 2.08SC 12 fl oz (2^{nd}, 4^{th})
8. A18126WG 0.66 fl oz/1000 row ft (E)
   Tilt/Bravo 4.3SC 1.5 pt (R_3, 3^{rd})
   Abound 2.08SC 12 fl oz (2^{nd}, 4^{th})
9. Tilt/Bravo 4.3SC 1.5 pt (R_3)
   Headline 2.09SC 9 fl oz (2^{nd}, 4^{th})
   Bravo Weather Stik 1.5 pt (3^{rd} spray)
10. Tilt/Bravo 4.3SC 1.5 pt (R_3)
    Priaxor 8 fl oz (2^{nd}, 4^{th})
    Bravo Weather Stik 1.5 pt (3^{rd} spray)

E. ADDITIONAL INFORMATION:
1. Location: TAREC Research Farm, Hare Rd., Suffolk, VA
2. Crop history: Corn 2013, cotton 2012, peanut 2011
3. Land preparation: rip and strip till
4. Planting date and cultivar: 4 May, Sugg

5. Soil fertility report: (Jan 2014)

pH.....	6.3	K	95 ppm
Ca	426 ppm	Zn.....	0.4 ppm
Mg	39 ppm	Mn.....	1.3 ppm
P.....	29 ppm	Soil type.....	Kenansville loamy fine sand

6. Cylindrocladium black rot control: Metam (42%) 7.5 gal/A (21 Apr)
7. Herbicide:
   Pre-plant – Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Prowl 1.0 pt (22 Apr)
   Strongarm 84WDG 0.22 oz + Dual II Magnum 1.0 pt + Gramaxone Inteon 1.0 pt/A (8 May)
   Post-emergence – Select Max 1.0 pt w/Induce 2.0 oz/A (11 Jun)
8. Insecticide: Admire Pro Systemic 550SC 9 fl oz/A (4 May, in-furrow)
   Orthene 75S 12 oz/A (27 May, 6 Jun)
9. Acaricide: Danitol 2.4EC 6.0 fl oz/A (29 Jul)
10. Sclerotinia control: Omega 500F 1.0 pt/A (29 Jul, 25 Aug)
11. Additional crop management:
    a. Liquid boron 1.0 qt/A (22 Apr)
    b. Liquid manganese (2 Jul, 29 Jul)
    c. ENC 1.0 qt/A (27 May, 6 Jun, 20 Jun)
    d. Landplaster: Peanut Maker 1200 lb/A (16 Jun)
    e. Irrigation: ca. 1" (30 Jul)
12. Harvest date: 13 Oct

Table 77. Effect of treatments on disease severity of peanut.

Treatment, rate/A and application date[1]	% leaf spot[2]		% defoliation[3]	
	30 Aug	7 Sep	30 Aug	7 Sep
Untreated	22.5 a	91.3 a	2.9 a	11.3 a
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.3 b	33.8 b	0.0 b	3.0 b
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 9.5 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	4.8 b	31.3 bc	0.3 b	3.0 b
Bravo Weather Stik 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 8/25, 9/15)	4.0 b	28.8 b-d	0.0 b	1.8 bc
Bravo Weather Stik 1.5 pt (7/14) Provost 3.6SC 8 fl oz (8/5, 8/25, 9/15)	2.8 b	18.0 de	0.0 b	1.5 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14) Fontelis 1.67SC 1 pt (8/5, 8/25, 9/15)	2.0 b	23.8 b-d	0.0 b	2.0 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	3.0 b	25.0 b-d	0.0 b	2.5 bc
A18126WG 0.66 fl oz/1000 row ft (5/28) Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	2.0 b	20.0 cd	0.0 b	1.5 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Headline 2.09SC 9 fl oz (8/5, 9/15)	3.0 b	6.8 e	0.0 b	0.8 c
Tilt/Bravo 4.3SC 1.5 pt (7/14) Priaxor 8 fl oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.8 b	6.8 e	0.0 b	1.3 bc
P(F)	**0.0001**	**0.0001**	**0.0001**	**0.0001**

[1] Band application at full emergence (28 May); fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).

[2] Percentage of total leaflets with early or late leaf spot lesions.

[3] Percentage of total canopy defoliated.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05). Arcsine transformation of percentage data was made in analysis to determine statistical significance.

Table 78. Effect of treatments on disease incidence of peanut.

Treatment, rate/A and application date[1]	Sclero-tinia[2] (17 Sep)	CBR[2] (17 Sep)	% leaf spot[3]		% defoliation[4]	
			23 Sep	3 Oct	23 Sep	3 Oct
Untreated	0.8	10.0 cd	95.0 a	99.0 a	25.0 a	47.5 a
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	1.8	8.5 d	77.5 b	85.0 ab	4.3 b-d	5.8 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 9.5 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.3	13.3 ab	72.5 bc	82.5 ab	6.5 b	8.3 bc
Bravo Weather Stik 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 8/25, 9/15)	3.3	14.0 a	76.3 b	85.0ab	4.3 b-d	5.3 bc
Bravo Weather Stik 1.5 pt (7/14) Provost 3.6SC 8 fl oz (8/5, 8/25, 9/15)	1.3	8.0 d	41.3 d	70.0 b	2.0 d	5.3 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14) Fontelis 1.67SC 1 pt (8/5, 8/25, 9/15)	2.8	12.0 a-c	58.8 c	67.5 b	2.5 cd	6.3 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	5.0	10.3 b-d	75.0 b	88.8 a	5.5 bc	11.3 b
A18126WG 0.66 fl oz/1000 row ft (5/28) Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	5.8	10.3 b-d	68.8 bc	83.8 ab	3.5 b-d	7.5 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Headline 2.09SC 9 fl oz (8/5, 9/15)	3.5	12.0 a-c	23.8 e	42.5 c	1.5 d	3.8 c
Tilt/Bravo 4.3SC 1.5 pt (7/14) Priaxor 8 fl oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	1.0	12.5 a-c	21.3 e	32.5 c	1.5 d	2.5 c
P(F)	0.27	**0.006**	**0.0001**	**0.0001**	**0.0001**	**0.0001**

[1] Band application at full emergence (28 May); fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).

[2] Counts of infection centers in the two centers rows of each plot or a total of 70 ft row. An infection center was a point with symptoms and signs of a disease and included 6 in. on either side of that point.

[3] Percentage of total leaflets with early or late leaf spot lesions.

[4] Percentage of total canopy defoliated.

Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05). Arcsine transformation of percentage data was made in analysis to determine statistical significance.

Table 79. Effect of treatments on disease severity and yield in peanut.

Treatment, rate/A and application date[1]	**Root disease[2] (6 Oct)**	**Pod rot[3] (6 Oct)**	**Yield[4] (lb/A)**
Untreated	3.5	1.8	4754 c
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.0	1.0	5787 a
Tilt/Bravo 4.3SC 1.5 pt (7/14) A18126WG 9.5 oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.5	1.5	5341 ab
Bravo Weather Stik 1.5 pt (7/14) A18126WG 7.14 oz (8/5, 8/25, 9/15)	3.3	1.3	5578 ab
Bravo Weather Stik 1.5 pt (7/14) Provost 3.6SC 8 fl oz (8/5, 8/25, 9/15)	3.5	1.0	5704 a
Tilt/Bravo 4.3SC 1.5 pt (7/14) Fontelis 1.67SC 1 pt (8/5, 8/25, 9/15)	4.0	1.8	5041 bc
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	3.5	1.3	5643 a
A18126WG 0.66 fl oz/1000 row ft (5/28) Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Abound 2.08SC 12 fl oz (8/5, 9/15)	4.0	1.5	5563 ab
Tilt/Bravo 4.3SC 1.5 pt (7/14, 8/25) Headline 2.09SC 9 fl oz (8/5, 9/15)	3.3	1.3	5321 a-c
Tilt/Bravo 4.3SC 1.5 pt (7/14) Priaxor 8 fl oz (8/5, 9/15) Bravo Weather Stik 1.5 pt (8/25)	3.3	1.5	5407 ab
P(F)	0.88	0.07	**0.03**

[1] Band application at full emergence (28 May); fungicides were applied at R_3 (beginning pod, 14 Jul) and thereafter according to the Va. Peanut Leaf Spot Advisory Program until R_7 (beginning maturity).

[2] Root disease includes Cylindrocladium black rot and Southern stem rot. Rating scale: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of roots decayed.

[3] Pod rot index: 0 = none, 1=1-10%, 2=11-25%, 3=26-50%, 4=51-75%, 5=76-90%, 6=91-100% of pods decayed.

[4] Yields are weight of peanuts with moisture content adjusted to 7%. Peanuts were dug 6 Oct and harvested 13 Oct. Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XXVI. EVALUATION OF IN-FURROW FUNGICIDES ON SOYBEAN FOR DISEASE CONTROL (SOYSEEDFUN114, Tidewater AREC, Field 56)

A. PURPOSE: To evaluate the efficacy of in-furrow fungicides for disease control in soybean.

B. EXPERIMENTAL DESIGN:
1. Treatments in plots of four, 30-ft rows, spaced 36 in. apart
2. Five replications in randomized complete block design separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: In-furrow (F) fungicides were applied to the seed furrow at planting (2 Jun) as a liquid mixture with water in a volume of 5 gal/A applied through microtubes; Burkholderia treatments were applied using a Noble box. Seed treatments (S) were applied by personnel with BASF Corporation. Foliar sprays were applied at R_1 (beginning flower, 17 Jul) with a Lee Spider sprayer having two, 8002VS nozzles per row spaced 18 in. apart and delivering a volume of 19.5 gal/A.

D. TREATMENT, RATE AND APPLICATION METHOD/TIMING:
1. Untreated check
2. Vault HP + Integral 2.0 fl oz/cwt (S)
3. Priaxor SC 2.0 fl oz/A (F)
4. Priaxor SC 4 fl oz/A (F)
5. Headline 4 fl oz/A (F)
6. Vault HP + Integral 2.0 fl oz/cwt (S)
   + Priaxor SC 4 fl oz/A (F)
7. Vault NP 8.4 fl oz/A (F)
8. Vault NP 8.4 fl oz/A (F)
   + Priaxor SC 4 fl oz/A (F)
9. Burkholderia 10 lb/A (F)
10. Burkholderia 20 lb/A (F)
11. Nutriplant SD (S)
    + Nutriplant AG 16 oz/A (F)
    + Nutriplant AG 16 oz/A (R1)

E. ADDITIONAL INFORMATION:
1. Location: Tidewater Agricultural Research and Extension Center, Holland Rd., Suffolk, VA
2. Crop history: Cotton 2013, corn 2012, soybean 2011
3. Planting date and variety: 2 Jun, AG4730
4. Soil fertility report (Jan 2014):

pH	6.5	K	221 ppm
Ca.....	874 ppm	Zn.....	0.5 ppm
Mg.....	76 ppm	Mn	1.9 ppm
P	55 ppm	Soil type.....	Nansemond fine sandy loam

5. Herbicide:

Post-emergence – Roundup WeatherMax 22 fl oz + First Rate 84WG
0.3 oz/A (20 Jun)
Buccaneer 22 fl oz/A (15 Jul)

6. Fertilization: 3-9-30 250 lb/A (10 May)
   ENC 1.0 qt/A (20 May)
   Mandate CNI 1.0 qt/A (25 Jun)
7. Harvest date: 19 Oct

Table 80. Effect of treatments on disease of soybeans.

Treatment, rate/A and application method/timing[1]	**No. seedlings damping off[2] (17 Jun)**	**% green stem area[3] (14 Oct)**	**% diseased stem area[4] (14 Oct)**
Untreated	0.8	10.0	14.0
Vault HP + Integral 2 fl oz/cwt (S)	1.4	16.0	13.0
Priaxor SC 2 fl oz/A (F)	0.0	10.6	12.0
Priaxor SC 4 fl oz/A (F)	0.6	10.6	12.0
Headline 4 fl oz/A (F)	0.2	9.6	13.0
Vault HP + Integral 2.0 fl oz/cwt (S) + Priaxor SC 4 fl oz/A (F)	0.0	14.0	14.0
Vault NP 8.4 fl oz/A (F)	0.4	13.0	12.0
Vault NP 8.4 fl oz/A (F) + Priaxor SC 4 fl oz/A (F)	0.2	10.0	13.0
Burkholderia 10 lb/A (F)	0.0	12.6	8.0
Burkholderia 20 lb/A (F)	0.2	9.2	12.0
Nutriplant SD (S) + Nutriplant AG 16 oz/A (F) Nutriplant AG 16 oz/A (R1)	0.2	9.6	13.0
P(F)	0.08	0.61	0.71

[1] S = seed treatment; F = in-furrow (2 Jun). Foliar treatment applied at R_1 (beginning flower, 17 Jul).
[2] Number of seedlings in two, 30-ft rows with symptoms of damping off.
[3] Percent of green stem area.
[4] Percent of stem area with symptoms of disease (*Cercospora*).

Table 81. Effect of treatments on yield and grade of soybeans.

Treatment, rate/A and application method/timing[1]	**Yield (bu/A)[2]**	**Wt./100 seed (oz)**	**% purple seed stain[3]**	**% anthracnose[3]**
Untreated	52.3	0.6	1.4	0.2
Vault HP + Integral 2 fl oz/cwt (S)	51.8	0.6	0.6	0.6
Priaxor SC 2 fl oz/A (F)	49.9	0.6	1.6	0.4
Priaxor SC 4 fl oz/A (F)	53.8	0.6	2.2	0.0
Headline 4 fl oz/A (F)	53.5	0.6	1.8	0.4
Vault HP + Integral 2.0 fl oz/cwt (S) + Priaxor SC 4 fl oz/A (F)	59.6	0.6	2.0	0.2
Vault NP 8.4 fl oz/A (F)	54.3	0.6	2.0	0.0
Vault NP 8.4 fl oz/A (F) + Priaxor SC 4 fl oz/A (F)	56.2	0.6	2.0	0.0
Burkholderia 10 lb/A (F)	51.9	0.6	2.6	0.2
Burkholderia 20 lb/A (F)	56.8	0.6	2.4	0.2
Nutriplant SD (S) + Nutriplant AG 16 oz/A (F) Nutriplant AG 16 oz/A (R1)	50.6	0.6	1.8	0.0
P(F)	0.08	0.60	0.26	0.59

[1] S = seed treatment; F = in-furrow (2 Jun). Foliar treatment applied at R_1 (beginning flower, 17 Jul).
[2] Yields are weight of soybeans adjusted to 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 19 Oct.
[3] Data are percent of 100 seed with symptoms of disease.

XXVII. EVALUATION OF IN-FURROW BIOLOGICAL APPLICATION IN SOYBEAN FOR SEEDLING DISEASE CONTROL (SOYBIO114, Tidewater AREC, Field 56)

A. PURPOSE: To evaluate in-furrow biological treatment for control of seedling disease in soybean.

B. EXPERIMENTAL DESIGN:
1. Main plots of eight, 30-ft rows spaced 36 in. apart
2. Subplots of two rows with and without Rhizoctonia inoculum in seed furrow
3. Five randomized complete blocks separated by 8-ft alleyways

C. APPLICATION OF TREATMENTS: In-furrow fungicides (F) applied to the seed furrow at planting (2 Jun) as a liquid mixture with water in a volume of 5 gal/A applied through microtubes.

D. INOCULUM: (Main-plots) Inoculum was prepared in the Plant Pathology Lab at the Tidewater AREC using seed of white millet moistened with a 2:1 ratio of seed to distilled water and autoclaved twice. The seed was then inoculated with *Rhizoctonia solani* that was isolated from peanut and allowed to incubate at room temperature for 10 days. Subsequently, seed was dried at room temperature for 4 days and then screened to ensure uniform size. Inoculum was applied to the seed furrow at 0.35 ml/ft of row.
1. Non-inoculated
2. Inoculated (Millet seed infested with *Rhizoctonia solani*)

E. TREATMENT AND RATE/A (sub-plots):
1. Untreated
2. Burkholderia 10 lb/A (F)

F. ADDITIONAL INFORMATION:
1. Location: Tidewater AREC, Holland Rd., Suffolk
2. Crop history: Corn 2013, soybean 2012, corn 2011
3. Planting date and variety: 2 Jun, AG 4730
4. Soil fertility report (Jan 2014):

pH	6.5	K	221 ppm
Ca.....	874 ppm	Zn.....	0.5 ppm
Mg.....	76 ppm	Mn	1.9 ppm
P	55 ppm	Soil type.....	Nansemond fine sandy loam

5. Herbicide:
Post-emergence – Roundup WeatherMax 22 fl oz + First Rate 84WG 0.3 oz/A (20 Jun)
Buccaneer 22 fl oz/A (15 Jul)
6. Fertilization: 3-9-30 250 lb/A (10 May)
ENC 1.0 qt/A (20 May)
Mandate CNI 1.0 qt/A (25 Jun)
7. Harvest date: 19 Oct

Table 82. Effects of treatments on emergence and plant health of soybean.

Treatment and rate/A[1]	Plants/ft[2]		% vigor[3]		
	16 Jun	24 Jun	16 Jun	24 Jun	11 Jul
***Split-plot analysis, P*(F)**					
Treatment	0.21	**0.04**	0.62	0.37	0.62
Inoculum	0.60	0.59	0.61	1.0	0.29
Treatment x inoculum	0.51	0.48	0.61	1.0	0.10
Inoculum mean					
Non-inoculated	8.2	8.6	99.8	99.8	99.8
Inoculated	8.0	8.4	99.6	99.8	99.5
Treatment mean					
Untreated	8.2	8.7a	99.8	99.8	99.7
Burkholderia 10 lb/A (F)	8.0	8.3b	99.6	99.8	99.6

[1] F = in-furrow (2 Jun).
[2] Determined from counts in two, 30-ft rows per plot.
[3] Percent vigor relative to the treatment in each replicate with the greatest vigor level.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

Table 83. Effects of treatments on growth and disease severity of soybean.

Treatment and rate/A[1]	No. seedlings damping off[2] (17 Jun)	% green stems[3] (14 Oct)	% diseased stems[4] (14 Oct)
Non-inoculated			
Untreated	0.0	6.4	12.0 a
Burkholderia 10 lb/A (F)	1.0	6.6	14.0 a
Inoculated			
Untreated	0.0	6.6	15.0 a
Burkholderia 10 lb/A (F)	0.4	7.4	9.0 b
***Split-plot analysis, P*(F)**			
Treatment	0.21	0.72	0.37
Inoculum	0.40	0.84	0.35
Treatment x inoculum	0.40	0.90	**0.004**
Inoculum mean			
Non-inoculated	0.5	6.5	3.0
Inoculated	0.2	7.0	12.0
Treatment mean			
Untreated	0.0	6.5	13.5
Burkholderia 10 lb/A (F)	0.7	7.0	11.5

[1] F = in-furrow (2 Jun).
[2] Number of seedlings in two, 30-ft rows with symptoms of damping off.
[3] Percent of green stem area.
[4] Percent of stem area with symptoms of disease, mostly Cercospora.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (P=0.05). Arcsine transformation of percentage data was made in analysis to determine statistical significance.

Table 84. Effect of seed treatments on yield and grade of soybeans.

Treatment and rate/A[1]	Yield (bu/A)[2]	Wt./100 seed (oz)	% purple seed stain[3]	% anthracnose[3]
***Split-plot analysis, P*(F)**				
Treatment	0.06	0.94	**0.03**	0.30
Inoculum	0.55	**0.04**	0.67	0.31
Treatment x inoculum	0.36	0.15	0.22	0.88
Inoculum mean				
Non-inoculated	59.2	0.6 b	1.1	1.7
Inoculated	58.1	0.6 a	0.9	1.0
Treatment mean				
Untreated	57.4	0.6	0.6 b	1.6
Burkholderia 10 lb/A (F)	59.9	0.6	1.4 a	1.1

[1] F = in-furrow (2 Jun).
[2] Yields are weight of soybeans adjusted to 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 19 Oct.
[3] Data are percent of 100 seed with symptoms of disease.
Means within a column and group followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XXVIII. EVALUATION OF FOLIAR FUNGICIDES FOR CONTROL OF SOYBEAN DISEASES (SOYFOLFUN114, Duke Farm, Field 45)

A. PURPOSE: To compare fungicides for foliar disease control and impact on soybean yield.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Four, 30-ft rows spaced 36" in. apart per plot
3. Data collected from two center rows of each plot

C. APPLICATION: Treatments were applied at V_3 (V_3 = 3 nodes on main stem, 25 Jun), V_5 (V_5 = 5 nodes on main stem, 2 Jul), R_1 (R_1 = 1 flower at any node, 17 Jul), and R_3 (beginning pod, 10 Aug) with a Lee Spider sprayer having eight, 8002VS nozzles spaced 18 in. apart and delivering a volume of 19.88 gal/A. All treatments were applied with Induce 6.4 fl oz/A (0.25% v/v).

D. TREATMENT AND RATE/A:
1. Untreated
2. Priaxor 4.17SC 4 fl oz (V_3)
3. Priaxor 4.17SC 6 fl oz (V_5)
4. Priaxor 4.17SC 6 fl oz (R_3)
5. Priaxor 4.17SC 4 fl oz (V_3)
   Priaxor 4.17SC 4 fl oz (R_3)
6. Priaxor 4.17SC 4 fl oz (V_5)
   Priaxor 4.17SC 4 fl oz (R_3)
7. Priaxor 4.17SC 4 fl oz (R_1)
8. Priaxor 4.17SC 4 fl oz (R_1)
   Priaxor 4.17SC 4 fl oz (R_3)

E. ADDITIONAL INFORMATION:
1. Location: Duke Farm/TAREC, Holland Rd., Suffolk, VA
2. Crop history: Corn 2013, soybean 2012, corn 2011
3. Land preparation: disk and level with board
4. Planting date and variety: 6 Jun, AG5332
5. Soil fertility report (Jan 2014):

pH	6.3	K.....	163 ppm
Ca.....	442 ppm	Zn	0.3 ppm
Mg.....	82 ppm	Mn	1.3 ppm
P	27 ppm	Soil type	Nansemond loamy fine sand

6. Herbicide:
   Post-emergence: Warrant 1.5 qt/A (6 Jun)
   First Rate 0.3 fl oz + Buccaneer 22 fl oz/A (25 Jun)
   Buccaneer 22 fl oz/A (15 Jul)
7. Fertilization: 3-9-30 250 lbs/A (10 May)
   Liquid manganese 1.0 qtA (25 Jun)
8. Harvest date: 19 Oct

Table 85. Effect of treatments on disease, defoliation, and senescence of soybeans.

Treatment, rate/A and application timing[1]	% foliar disease (15 Sep)		% defoliation[4]		% Cercospora blight[5] (6 Oct)	% yellow canopy[6] (6 Oct)
	Upper canopy[2]	Lower canopy[3]	(15 Sep)	(6 Oct)		
Untreated	7.0 a	12.2 a	5.0	84.0 a	15.0	56.0
Priaxor 4.17SC 4 fl oz (V_3)	5.8 ab	9.2 b	5.0	72.0 b	17.0	54.0
Priaxor 4.17SC 6 fl oz (V_5)	5.8 ab	8.8 b	4.4	70.0 b	15.0	54.0
Priaxor 4.17SC 6 fl oz (R_3)	4.2 c	6.6 c	4.6	48.0 c	13.0	58.0
Priaxor 4.17SC 4 fl oz (V_3) Priaxor 4.17SC 4 fl oz (R_3)	4.2 c	5.8 c	4.6	50.0 c	16.0	60.0
Priaxor 4.17SC 4 fl oz (V_5) Priaxor 4.17SC 4 fl oz (R_3)	4.0 c	6.4 c	5.0	47.0 c	15.0	60.0
Priaxor 4.17SC 4 fl oz (R_1)	4.8 bc	6.2 c	4.6	66.0 b	15.0	54.0
Priaxor 4.17SC 4 fl oz (R_1) Priaxor 4.17SC 4 fl oz (R_3)	4.0 c	5.4 c	3.8	42.0 c	13.0	56.0
P(F)	**0.004**	**0.0001**	0.39	**0.0001**	0.26	0.36

[1] Foliar treatments were applied at V_3 (V_3 = 3 nodes on main stem, 25 Jun), V_5 (V_5 = 5 nodes on main stem, 2 Jul), R_1 (R_1 = 1 flower at any node, 17 Jul), and R_3 (beginning pod, 10 Aug).
[2] Percent leaf area with brown spot and Cercospora.
[3] Percent leaf area with target spot and brown spot.
[4] Percent canopy defoliated.
[5] Percent leaf area with Cercospora blight.
[6] Overall yellowing as an indication of senescence.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 86. Effect of treatments on disease, defoliation, and senescence of soybeans, 14 Oct.

Treatment, rate/A and application timing[1]	% disease[2] (14 Oct)		% yellow canopy[3] (14 Oct)	% defoliation[4] (14 Oct)
	Leaf area	Stem area		
Untreated	17.0	16.0	2.8 d	95.2 a
Priaxor 4.17SC 4 fl oz (V_3)	17.0	18.0	5.0 cd	92.6 ab
Priaxor 4.17SC 6 fl oz (V_5)	16.0	15.0	6.2 b-d	93.0 ab
Priaxor 4.17SC 6 fl oz (R_3)	15.0	15.0	10.0 ab	89.0 cd
Priaxor 4.17SC 4 fl oz (V_3) Priaxor 4.17SC 4 fl oz (R_3)	16.0	15.0	8.0 a-c	92.0 a-c
Priaxor 4.17SC 4 fl oz (V_5) Priaxor 4.17SC 4 fl oz (R_3)	17.0	14.0	9.0 a-c	91.0 b-d
Priaxor 4.17SC 4 fl oz (R_1)	17.0	15.0	8.0 a-c	88.0 de
Priaxor 4.17SC 4 fl oz (R_1) Priaxor 4.17SC 4 fl oz (R_3)	15.0	12.0	12.0 a	85.0 e
P(F)	0.75	0.13	**0.009**	**0.0001**

[1] Foliar treatments were applied at V_3 (V_3 = 3 nodes on main stem, 25 Jun), V_5 (V_5 = 5 nodes on main stem, 2 Jul), R_1 (R_1 = 1 flower at any node, 17 Jul), and R_3 (beginning pod, 10 Aug).
[2] Percent area with symptoms of Cercospora blight.
[3] Overall yellowing as an indication of senescence.
[4] Percent canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 87. Effect of treatments on yield and grade of soybeans.

Treatment, rate/A and application timing[1]	Yield (bu/A)[2]	Wt./100 seed (oz)	% purple seed stain[3]	% anthracnose[3]
Untreated	68.0	.5764	2.6	0.2
Priaxor 4.17SC 4 fl oz (V_3)	67.9	.5785	2.6	0.6
Priaxor 4.17SC 6 fl oz (V_5)	70.2	.5813	2.2	0.0
Priaxor 4.17SC 6 fl oz (R_3)	71.4	.5891	3.0	0.8
Priaxor 4.17SC 4 fl oz (V_3) Priaxor 4.17SC 4 fl oz (R_3)	67.8	.5933	3.0	0.6
Priaxor 4.17SC 4 fl oz (V_5) Priaxor 4.17SC 4 fl oz (R_3)	70.6	.5778	2.8	0.4
Priaxor 4.17SC 4 fl oz (R_1)	67.9	.5997	1.6	0.0
Priaxor 4.17SC 4 fl oz (R_1) Priaxor 4.17SC 4 fl oz (R_3)	68.9	.6018	2.8	0.2
P(F)	0.83	0.12	0.80	0.60

[1] Foliar treatments were applied at V_3 (V_3 = 3 nodes on main stem, 25 Jun), V_5 (V_5 = 5 nodes on main stem, 2 Jul), R_1 (R_1 = 1 flower at any node, 17 Jul), and R_3 (beginning pod, 10 Aug).
[2] Yields are weight of soybeans with 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 19 Oct.
[3] Data are percent of 100 seed with symptoms of disease.

XXIX. EVALUATION OF FOLIAR FUNGICIDES FOR CONTROL OF SOYBEAN DISEASES (SOYFOLFUN214, Duke Farm, Field 45)

A. PURPOSE: To compare fungicides for foliar disease control and impact on soybean yield.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Four, 30-ft rows spaced 36 in. apart per plot
3. Data collected from two center rows of each plot

C. APPLICATION: Treatments were applied at R_3 (beginning pod, 10 Aug) with a Lee Spider sprayer having eight, 8002VS nozzles spaced 18 in. apart and delivering a volume of 19.88 gal/A. All treatments were applied with Induce 6.4 fl oz/A (0.25% v/v).

D. TREATMENT AND RATE/A:
1. Untreated
2. Aproach Prima 2.34SC 6.8 fl oz
3. Quadris Top 8 fl oz
4. Priaxor 4.17SC 4 fl oz
5. Domark 1.9ME 5 fl oz
6. Tilt 3.6SC 3 fl oz
7. Stratego YLD 4.18SC 4 fl oz

E. ADDITIONAL INFORMATION:
1. Location: Duke Farm/TAREC, Holland Rd., Suffolk, VA
2. Crop history: Corn 2013, soybean 2012, corn 2011
3. Land preparation: disk and level with board
4. Planting date and variety: 6 Jun, AG5332
5. Soil fertility report (Jan 2014):

pH	6.3	K.....	163 ppm
Ca.....	442 ppm	Zn	0.3 ppm
Mg.....	82 ppm	Mn	1.3 ppm
P	27 ppm	Soil type	Nansemond loamy fine sand

6. Herbicide:
   Post-emergence: Warrant 1.5 qt/A (6 Jun)
   First Rate 0.3 fl oz + Buccaneer 22 fl oz/A (25 Jun)
   Buccaneer 22 fl oz/A (15 Jul)
7. Fertilization: 3-9-30 250 lbs/A (10 May)
   Liquid manganese 1.0 qtA (25 Jun)
8. Harvest date: 19 Oct

Table 88. Effect of treatments on disease, defoliation and senescence of soybeans.

Treatment, rate/A[1]	% foliar disease (15 Sep)		% defoliation[4]		% Cercospora blight[5] (6 Oct)	% yellow canopy[6] (6 Oct)
	Upper canopy[2]	Lower canopy[3]	(15 Sep)	(6 Oct)		
Untreated	6.6 a	12.4 a	5.8	80.0 a	17.0 ab	62.0
Aproach Prima 2.34SC 6.8 fl oz	3.6 cd	6.2 c	4.6	60.0 bc	17.0 ab	60.0
Quadris Top 8 fl oz	5.0 b	7.4 bc	4.2	60.0 bc	8.0 c	58.0
Priaxor 4.17SC 4 fl oz	3.2 d	6.2 c	4.6	60.0 bc	19.0 a	60.0
Domark 1.9ME 5 fl oz	4.2 b-d	8.6 b	4.6	69.0 b	7.0 c	60.0
Tilt 3.6SC 3 fl oz	4.8 bc	7.0 bc	4.6	68.0 b	14.0 b	58.0
Stratego YLD 4.18SC 4 fl oz	4.8 bc	8.2 bc	5.0	50.0 c	15.0 ab	62.0
P(F)	**0.001**	**0.0002**	0.35	**0.0001**	**0.0001**	0.94

[1] Foliar treatment applied at R_3 (beginning pod, 10 Aug).
[2] Percent leaf area with brown spot and Cercospora.
[3] Percent leaf area with target spot and brown spot.
[4] Percent canopy defoliated.
[5] Percent leaf area with symptoms of Cercospora blight.
[6] Overall yellowing as an indication of senescence.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 89. Effect of treatments on disease, senescence, and defoliation of soybeans, 14 Oct.

Treatment, rate/A[1]	% disease[2] (14 Oct)		% yellow canopy[3] (14 Oct)	% defoliation[4] (14 Oct)
	Leaf area	Stem area		
Untreated	17.0 a	19.0 a	1.0 d	94.0
Aproach Prima 2.34SC 6.8 fl oz	15.0 ab	14.0 bc	3.4 cd	92.0
Quadris Top 8 fl oz	13.0 b	8.0 e	8.0 a	89.0
Priaxor 4.17SC 4 fl oz	15.0 ab	15.0 b	3.4 cd	91.0
Domark 1.9ME 5 fl oz	14.0 ab	15.0 b	3.4 cd	92.0
Tilt 3.6SC 3 fl oz	14.0 ab	10.0 de	4.2 bc	91.0
Stratego YLD 4.18SC 4 fl oz	14.0 ab	12.0 cd	7.0 ab	89.0
P(F)	0.51	**0.0001**	**0.0005**	0.07

[1] Foliar treatment applied at R_3 (beginning pod, 10 Aug).
[2] Percent area with symptoms of Cercospora blight.
[3] Overall yellowing as an indication of senescence.
[4] Percent canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 90. Effect of treatments on yield and grade of soybeans.

Treatment, rate/A[1]	**Yield (bu/A)**[2]	**Wt./100 seed (oz)**	**% purple seed stain**[3]	**% anthracnose**[3]
Untreated	71.0	.5834	0.6	1.6
Aproach Prima 2.34SC 6.8 fl oz	71.0	.5799	1.8	1.8
Quadris Top 8 fl oz	73.2	.5919	1.0	2.0
Priaxor 4.17SC 4 fl oz	71.0	.5947	1.6	1.4
Domark 1.9ME 5 fl oz	67.7	.5905	1.4	2.2
Tilt 3.6SC 3 fl oz	68.5	.5750	1.4	1.2
Stratego YLD 4.18SC 4 fl oz	69.3	.5856	2.6	1.4
P(F)	0.39	0.55	0.17	0.74

[1] Foliar treatment applied at R_3 (beginning pod, 10 Aug).
[2] Yields are weight of soybeans with 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 19 Oct.
[3] Data are percent of 100 seed with symptoms of disease.

XXX. EVALUATION OF WEATHER-BASED ADVISORIES FOR ASSESSING RISK FOR FOLIAR DISEASES OF SOYBEAN (SOYFUNADV114, Duke Farm, Field 45)

A. PURPOSE: To evaluate weather-based criteria in timing fungicide sprays for increased efficiency and profitability of foliar disease control in soybean.

B. EXPERIMENTAL DESIGN:
1. Five, randomized complete blocks with 8-ft alleys between blocks
2. Plots 12-ft wide planted to eight, 30-ft rows spaced 18-in. apart
3. Data collected from the four center rows of each plot

C. APPLICATION: Priaxor 4.17SC 4 fl oz/A was applied with Induce 6.4 fl oz/A with a Lee Spider sprayer having eight, 8002VS nozzles spaced 18 in. apart and delivering a volume of 19.88 gal/A.

D. ADVISORY SPRAY THRESHOLDS: Parameters for favorable conditions for leaf infection and disease were determined between R_3 (10 Aug) and R_6 (10 Sep) for timing of fungicide application. Air temperature criteria included daily averages ≥65°F and ≤78°F, and moisture provided by periods of relative humidity ≥95% for ≥10 hrs/day. Thresholds for fungicide application were 2 consecutive favorable days during the monitoring period. The protection interval (PI) after each fungicide spray was 21 days before re-starting each model. Advisory models were compared to sprays applied at different timings between R_3 and R_6 growth stages.

1. Untreated
2. R_3 (beginning pod)
3. R_3 (beginning pod)
   R_3 + 21 days
4. 1 advisory spray
5. Multiple advisory sprays
6. 1 spray 1 week after R_3
7. 1 spray 2 weeks after R_3
8. 1 spray 3 weeks after R_3
9. 1 spray 4 weeks after R_3
10. Weekly sprays between R_3 and R_5
11. Untreated

E. ADDITIONAL INFORMATION:
1. Location: Duke Farm/TAREC, Holland Rd, Suffolk
2. Crop history: corn 2013, soybean 2012, corn 2011
3. Land preparation: disk and level with board
4. Planting date and variety: 6 Jun, AG5332
5. Soil fertility report (17 Jan):

pH	6.47	Mn	42 ppm
Ca.....	269 ppm	K.....	63 ppm
Mg.....	42 ppm	Zn	0.6 ppm
P	20 ppm	Soil type	Nansemond loamy fine sand

6. Herbicide:
   Pre-plant: Roundup WeatherMax 22 fl oz/A (4 Apr)
   Post-emergence: Roundup WeatherMax 22 fl oz/A (20 Jun)
   Roundup Weather Max 22 fl oz + First Rate 0.3 oz/A (8 Jul)

7. Fertilization: 3-9-30 250 lbs/A (4 Apr)
   ENC 1.0 qt/A (20 Jun, 31 Jul, 8 Aug, 22 Aug)
   ENC 1.0 qt + Manganese 1.0 qt/A (8 Jul)
8. Insecticide: Brigade 2EC 6 fl oz + Belt SC 2 fl oz/A (22 Aug)
9. Harvest date: 19 Oct

Table 91. Effect of treatments on disease, senescence, and defoliation of soybeans.

Treatment application timing/dates[1]	% foliar disease (23 Sep)		% foliar disease[2] (6 Oct)	% yellow[4]		% defoliation[5]	
	Upper canopy[2]	Lower canopy[3]		23 Sep	6 Oct	23 Sep	6 Oct
Untreated	15.0 ab	18.0 ab	18.0 ab	15.4	64.0	12.0 a-c	77.0 a
1st spray @ R_3, beginning pod (8/10)	10.4 c	12.0 c	14.0 b-d	13.4	60.0	11.4 bc	57.0 b-d
1st spray @ R_3, beginning pod (8/10) 2nd spray @ R_3 + 21 days (9/2)	10.4 c	14.0 bc	12.0 cd	12.4	60.0	11.0 bc	42.0 e
1 advisory spray (8/10)	10.8 c	12.4 c	19.0 a	10.8	62.0	14.0 ab	49.0 c-e
Multiple advisory sprays (8/10, 8/28)	11.0 bc	12.8 c	13.0 cd	12.2	65.0	11.4 bc	40.0 e
1 spray 1 week after R_3 (8/21)	9.8 c	11.0 c	12.0 cd	10.2	58.0	9.4 c	47.0 c-e
1 spray 2 weeks after R_3 (8/26)	12.4 a-c	12.0 c	15.0 a-c	14.4	69.0	10.0 c	59.0 bc
1 spray 3 weeks after R_3 (9/2)	13.2 a-c	14.8 bc	14.0 b-d	15.4	65.0	14.0 ab	57.0 b-d
1 spray 4 weeks after R_3 (9/18)	16.0 a	20.0 a	12.0 cd	16.4	64.0	14.0 ab	70.0 ab
Weekly sprays between R_3 and R_5 (8/10, 8/26)	11.8 bc	11.8 c	10.0 d	13.4	64.0	12.0 a-c	44.0 de
Untreated	16.4 a	20.0 a	18.0 ab	14.4	58.0	15.0 a	81.0 a
P(F)	**0.01**	**0.0008**	**0.0008**	0.15	0.29	**0.01**	**0.0001**

[1] Priaxor 4.17SC 4 fl oz/A.
[2] Percent leaf area with foliar disease, primarily Cercospora blight.
[3] Percent leaf area with foliar disease, primarily Septoria brown spot.
[4] Overall yellowing as an indication of senescence.
[5] Percent canopy defoliated.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05). Percentage data were arcsine transformed prior to statistical analysis.

Table 92. Effect of treatments on yield and grade of soybeans.

Treatment application timing/dates[1]	Yield (bu/A)[2]	Wt./100 seed (oz)	% purple seed stain[3]	% anthracnose[3]
Untreated	62.3	0.6 c	0.0	2.0
1st spray @ R_3, beginning pod (8/10)	67.4	0.6 c	1.4	1.8
1st spray @ R_3, beginning pod (8/10) 2nd spray @ R_3 + 21 days (9/2)	63.6	0.6 a-c	1.6	1.4
1 advisory spray (8/10)	65.3	0.6 a	2.4	1.2
Multiple advisory sprays (8/10, 8/28)	64.9	0.6 ab	1.8	2.0
1 spray 1 week after R_3 (8/21)	64.0	0.6 ab	1.0	1.8
1 spray 2 weeks after R_3 (8/26)	66.0	0.6 ab	2.8	2.6
1 spray 3 weeks after R_3 (9/2)	67.0	0.6 a-c	2.6	2.6
1 spray 4 weeks after R_3 (9/18)	62.5	0.6 bc	1.8	2.4
Weekly sprays between R_3 and R_5 (8/10, 8/26)	69.3	0.6 a	1.2	1.6
Untreated	61.3	0.6 c	1.4	2.2
P(F)	0.15	0.01	0.20	0.91

[1] Priaxor 4.17SC 4 fl oz/A.
[2] Yields are weight of soybeans with 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 19 Oct.
[3] Data are percent of 100 seed with symptoms of disease.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XXXI. EVALUATION OF WEATHER-BASED ADVISORIES FOR ASSESSING RISK FOR FOLIAR DISEASES OF SOYBEAN (SOYFUNADV314, Eastern Virginia AREC, Warsaw, VA)

A. PURPOSE: To evaluate weather-based criteria in timing fungicide sprays for increased efficiency and profitability of foliar disease control

B. EXPERIMENTAL DESIGN:
   1. Five, randomized complete blocks with 6-ft alleys between blocks
   2. Plots planted to six, 30-ft rows spaced 8-in. apart
   3. Data collected from the four center rows of each plot

C. APPLICATION: All fungicides were applied with Induce 6.4 fl oz/A according to advisory spray thresholds with a backpack sprayer having four, 8004VS nozzles spaced 18 in. apart and delivering a volume of 19.5 gal/A.

D. ADVISORY SPRAY THRESHOLDS: Parameters for favorable conditions for leaf infection and disease were determined between R_3 (25 Jul) and R_6 (25 Aug) for timing of fungicide application. Air temperature criteria included daily averages ≥65°F and ≤78°F, and moisture provided by periods of relative humidity ≥95% for ≥10 hrs/day. Thresholds for fungicide application were 2 consecutive favorable days during the monitoring period. The protection interval (PI) after each fungicide spray was 21 days before re-starting each model. Advisory models were compared to sprays applied at R_3 and R_3 + 21 days.

   1. Untreated
   2. 1st spray (R_3, beginning pod)
   3. 1st spray (R_3, beginning pod)
      2nd spray (R_3 + 21 days)
   4. 1 advisory spray
   5. Multiple advisory sprays
   6. 1 spray 1 week after R_3
   7. 1 spray 2 weeks after R_3
   8. 1 spray 3 weeks after R_3
   9. 1 spray 4 weeks after R_3
   10. Weekly sprays between R_3 and R_5
   11. 1 spray 5 weeks after R_3

E. ADDITIONAL INFORMATION:
   1. Location: Eastern Virginia AREC, 2229 Menokin Rd., Warsaw, VA, 22572
   2. Planting date and variety: 27 May, AG5332
   3. Harvest date: 9 Oct

Table 93. Effect of treatments on yield and grade of soybeans, Warsaw, VA.

Treatment application timing/dates[1]	**Yield (bu/A)**[2]	**Wt./100 seed (oz)**	**% purple seed stain**[3]
Untreated	56.3 e	0.5 bc	3.4
1st spray @ R_3, beginning pod (7/25)	61.6 cd	0.5 ab	4.6
1st spray @ R_3, beginning pod (7/25) 2nd spray @ R_3 + 21 days (8/14)	68.2 a	0.6 a	4.6
1 advisory spray (7/25)	63.3 bc	0.5 a	5.0
Multiple advisory sprays (7/25, 8/14)	66.9 ab	0.6 a	3.2
1 spray 1 week after R_3 (8/6)	64.6 a-c	0.6 a	3.6
1 spray 2 weeks after R_3 (8/14)	61.0 cd	0.5 ab	3.6
1 spray 3 weeks after R_3 (8/20)	62.8 cd	0.5 ab	3.4
1 spray 4 weeks after R_3 (8/27)	59.0 de	0.5 a-c	3.8
Weekly sprays between R_3 and R_5 (7/25, 8/14, 8/27)	67.9 a	0.6 a	3.8
1 spray 5 weeks after R_3 (9/3)	56.5 e	0.5 c	3.2
P(F)	**0.0001**	**0.005**	0.23

[1] Priaxor 4.17SC 4 fl oz/A.
[2] Yields are weight of soybeans with 13.5% moisture. One bushel equals 60 lb. Soybeans were harvested 9 Oct.
[3] Data are percent of 100 seed with symptoms of disease.
Means in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).

XXXII. CLIMATOLOGICAL SUMMARY OF THE 2014 GROWING SEASON AT THE TIDEWATER AGRICULTURAL RESEARCH & EXTENSION CENTER, SUFFOLK, VA.

Table 94. Daily maximum and minimum temperatures (◦F) November 2013 - April 2014.

Day of month	NOV		DEC		JAN		FEB		MAR		APR	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	77	63	51	28	50	23	52	15	35	21	67	31
2	75	58	56	24	52	30	55	35	56	25	75	39
3	71	43	59	24	47	23	61	40	74	34	80	49
4	62	31	63	40	32	12	55	32	45	12	73	47
5	55	37	70	48	44	27	43	32	38	24	87	58
6	67	42	73	55	49	33	49	26	44	27	75	36
7	74	55	80	37	65	8	38	24	43	32	58	44
8	70	30	45	33	26	8	47	25	43	29	75	52
9	57	26	39	31	41	18	44	22	66	38	70	46
10	61	33	47	34	52	26	45	29	64	25	68	36
11	70	27	42	21	67	40	39	23	71	42	75	49
12	70	32	49	19	71	40	33	18	80	44	81	51
13	55	26	41	17	56	28	43	25	70	32	78	51
14	47	17	50	25	59	35	51	30	41	17	84	57
15	61	24	60	38	64	30	61	36	61	36	83	62
16	66	48	55	25	57	32	48	20	73	36	74	30
17	65	44	51	31	44	22	50	21	53	30	54	29
18	74	57	62	28	57	31	47	27	38	29	57	33
19	73	38	47	22	40	18	65	30	43	34	56	43
20	54	33	62	35	53	24	59	28	56	39	54	44
21	55	41	70	45	65	33	74	39	67	26	62	40
22	64	39	72	46	53	11	79	32	70	42	69	39
23	63	33	81	50	35	4	63	26	77	48	83	51
24	60	25	73	34	33	6	70	35	52	26	69	38
25	37	14	45	21	32	8	59	24	50	28	70	39
26	45	28	39	20	40	18	44	25	46	35	78	49
27	57	41	47	20	51	31	45	21	55	20	78	49
28	47	22	54	21	65	21	52	20	73	39	78	46
29	43	19	60	35	25	12			68	60	57	47
30	48	25	49	19	25	8			53	30	74	51
31			55	30	37	9			70	41		
Avg.	**61**	**35**	**56**	**31**	**48**	**22**	**53**	**27**	**57**	**31**	**71**	**45**
Normal	**62**	**42**	**52**	**34**	**49**	**31**	**52**	**33**	**60**	**40**	**69**	**48**
Deviation from normal	**-1**	**-7**	**+4**	**-3**	**-1**	**-7**	**+1**	**-4**	**-3**	**-9**	**+2**	**-3**

Table 95. Daily maximum and minimum temperatures (◦F) May 2014 – October 2014.												
Day of month	**MAY**		**JUN**		**JUL**		**AUG**		**SEP**		**OCT**	
	Max.	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**
1	82	55	75	49	90	64	86	68	91	69	78	53
2	83	54	75	40	91	69	76	62	94	70	79	58
3	70	50	81	51	96	70	75	62	96	69	79	52
4	78	47	89	51	93	68	78	64	93	65	78	62
5	70	49	92	67	85	55	84	68	92	65	76	34
6	74	53	87	58	84	52	86	64	92	68	67	37
7	80	55	85	53	86	56	90	62	91	69	74	48
8	90	64	84	54	92	68	84	58	89	70	77	58
9	90	61	87	59	94	70	84	62	78	65	82	44
10	88	67	89	62	95	67	78	64	82	69	76	50
11	87	60	93	69	84	65	84	58	83	62	75	57
12	90	59	93	67	84	63	85	58	87	69	64	54
13	94	68	82	65	88	64	90	62	77	65	67	57
14	88	65	88	64	92	68	86	55	87	60	75	60
15	85	65	85	65	88	64	84	59	74	56	76	68
16	80	57	86	61	89	65	85	58	76	59	72	50
17	72	50	90	63	81	58	86	59	83	62	76	52
18	72	50	96	66	86	56	87	60	77	51	65	52
19	77	45	98	69	86	58	88	62	80	55	62	59
20	80	48	97	66	84	59	85	65	77	51	60	31
21	88	62	87	66	86	58	90	64	81	63	64	46
22	92	64	85	67	91	69	91	65	84	60	69	54
23	84	62	81	58	87	67	81	65	80	52	70	49
24	78	53	84	58	92	71	79	62	68	53	65	42
25	87	53	87	56	85	64	80	55	70	61	65	39
26	88	58	91	69	86	60	80	56	69	59	55	45
27	92	69	91	66	90	68	83	56	77	52	60	31
28	94	67	88	65	81	70	86	59	79	49	75	55
29	77	62	85	54	88	59	90	65	79	51	70	55
30	74	59	82	63	82	55	85	65	79	58	68	54
31	81	57			83	56	83	62			70	50
Avg.	**83**	**58**	**87**	**61**	**88**	**63**	**84**	**61**	**82**	**61**	**71**	**50**
Normal	**76**	**57**	**84**	**66**	**87**	**70**	**86**	**69**	**80**	**63**	**71**	**52**
Deviation from normal	**+7**	**+1**	**+3**	**-5**	**+1**	**-7**	**-2**	**-8**	**+2**	**-2**	**0**	**-2**

Table 96. Daily precipitation (inches) November 2013– April 2014.						
Day of month	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**
1	0.00	0.00	0.00	0.00	0.00	0.00
2	0.63	0.00	0.00	0.80	0.00	0.00
3	0.00	0.00	0.00	0.09	0.00	0.00
4	0.00	0.07	0.00	0.13	0.00	0.00
5	0.00	0.00	0.00	0.39	0.32	0.00
6	0.00	0.00	0.00	0.05	0.00	0.00
7	0.65	0.77	0.00	0.00	0.59	0.50
8	0.00	0.11	0.00	0.00	0.15	0.48
9	0.00	0.38	0.00	0.00	0.00	0.00
10	0.00	1.00	0.17	0.00	0.00	0.00
11	0.00	0.20	0.08	0.00	0.00	0.00
12	0.00	0.00	1.20	0.00	0.00	0.00
13	0.00	0.00	0.00	0.71	0.31	0.00
14	0.00	0.00	0.00	0.11	0.00	0.00
15	0.00	0.81	0.37	0.00	0.00	0.00
16	0.00	0.00	0.00	0.50	0.00	2.05
17	0.00	0.00	0.00	0.00	0.48	0.00
18	0.12	0.00	0.04	0.00	0.30	0.00
19	0.00	0.00	0.00	0.00	0.05	0.05
20	0.00	0.00	0.00	0.00	0.10	0.09
21	0.00	0.00	0.00	0.00	0.00	0.08
22	0.00	0.00	0.00	0.40	0.00	0.00
23	0.00	0.61	0.00	0.00	0.00	0.00
24	0.00	0.96	0.00	0.00	0.11	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	1.44
27	1.86	0.00	0.00	0.00	0.00	0.00
28	0.34	0.00	0.00	0.00	0.00	0.00
29	0.00	0.40	0.00		0.00	0.70
30	0.00	0.00	0.00		0.48	0.07
31		0.00	0.00		0.00	
Total	**3.60**	**5.31**	**1.86**	**3.18**	**2.89**	**5.46**
Normal	**3.54**	**3.50**	**3.62**	**3.23**	**4.06**	**3.54**
Deviation from normal	**+0.06**	**+1.81**	**-1.76**	**-0.05**	**-1.17**	**+1.92**

Table 97. Daily precipitation (inches) May 2014 – October 2014.						
Day of month	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**
1	0.00	0.00	0.00	0.02	0.00	0.00
2	0.00	0.00	0.00	2.10	0.00	0.50
3	0.00	0.00	0.00	2.50	0.00	0.00
4	0.00	0.00	0.00	0.00	0.25	0.28
5	0.11	0.04	0.00	0.00	1.02	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	1.42	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.06	0.00	0.01	3.90	0.00
10	0.10	0.30	1.03	0.00	0.06	0.00
11	0.00	0.00	1.80	0.00	0.00	0.04
12	0.00	0.65	0.00	0.00	0.00	0.02
13	0.00	0.17	0.00	0.08	0.00	0.00
14	0.00	0.09	0.00	0.00	0.15	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00
16	1.70	0.00	0.00	0.05	0.00	0.62
17	0.00	0.00	0.00	0.00	0.00	0.00
18	1.50	0.16	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.30	0.00	0.00
20	0.00	0.23	0.00	0.02	0.00	0.00
21	0.00	0.22	0.00	0.00	0.05	0.00
22	0.05	0.50	0.00	0.00	0.00	0.00
23	0.14	0.00	0.00	0.00	0.00	0.00
24	0.03	0.00	0.00	0.11	0.20	0.00
25	0.00	0.00	1.05	0.00	1.75	0.00
26	0.00	0.12	0.00	0.00	0.50	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00
28	0.81	0.87	0.01	0.00	0.00	0.00
29	0.32	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	0.00		0.00
Total	**4.76**	**3.41**	**3.89**	**6.61**	**7.88**	**1.46**
Normal	**3.82**	**4.37**	**5.16**	**5.71**	**5.31**	**3.62**
Deviation from normal	**+0.94**	**-0.96**	**-1.27**	**+0.90**	**+2.57**	**-2.16**