Beaufort County Cooperative Extension
2010 Wheat On-Farm-Test Report

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To: Beaufort County Wheat Producers and Agribusinessmen

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The 2010 Beaufort County Cooperative Extension Wheat On-Farm-Test Report is made available because of the donations of land, materials and resources of many individuals, companies and organizations. I especially want to thank Steve Griffin Farms and 3B Farms for their cooperation with the on-farm-tests. In addition, the Beaufort County wheat on-farm-testing program would not be possible without the cooperation and support of Randy Weisz, Paul Murphy, Ron Heiniger, Daryl Bowman, Christina Cowger, Tim Smith, Barry Tarleton, Phil Johnson and Dwight Parrish of N.C. State University and the support of the N.C. Small Grain Growers Association.

I hope the information included in this report will be beneficial to wheat producers. Thanks for your support of the Cooperative Extension Service in Beaufort County.

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Wheat Variety Tests

In 2009-10 forty-five varieties were evaluated for disease resistance, Hessian fly resistance, lodging resistance, and yield. The variety tests were conducted on 3B Farms in the Vann Swamp community and on the Steve Griffin Farms in the Big Swamp community. The variety tests utilized a randomized complete block design with three or four replications. The plot size was seven feet wide and twenty-five feet long. The 3B Farm location was planted October 22 and the Griffin Farm location was planted November 5 and replanted on November 29. The wheat yield performances for one, two and three years in Beaufort County are on page 2. The top yielding varieties this year included DG Shirley, Pioneer 26R24, DG WX09612, DG Dominion, DG Baldwin, Coker 9436, Cape Fear, Pioneer 26R22, Pioneer 26R12, and SS 5205. Over the last three years the above average yielder included SS 8404, DG Dominion, Coker 9312, SS 8641, SS 8302, DG V9723, Pioneer 26R12, Coker 9700, Magnolia, Pioneer 26R31, and Neuse. Results from the Official Variety Test conducted on Griffin Farms are on page 3.

The 3B Farms site provides an opportunity to evaluate varieties resistance and/or tolerance to Hessian fly. Hessian fly resistance ranged from poor to good. The Hessian fly resistance ratings are reported on page 4. The ratings include percent of tillers infected by Hessian fly, the number of pupae found in ten plants, resistance rating, and yield.

Characteristics on North Carolina wheat varieties are reported on page 5.

There are four rules to keep in mind when choosing a wheat variety. First, has the variety been evaluated in the Official Variety Test and/or in a nearby county trial over the last two years. Second, select a variety that produces a yield above the average of the varieties tested. Third, does the variety offer a pest resistance to the most limiting pest in your region? Fourth, when planting early, select a variety with a late heading date.

Table 1. Wheat Variety Performance in Beaufort County, 2008-10.

Variety	Three Year 2009-10 Yield (bu/a)	Three Year 2009-10 Yield Rank	Two Year 2009-10 Yield (bu/a)	Two Year 2009-10 Yield Rank	One Year 2010 Yield (bu/a)	One Year 2010 Yield Rank
SS8404	65.6	1	64.5	4	44.1	16
DG Dominion	64.5	2	65.4	3	47.7	4
Coker 9312	63.5	3	63.8	6	44.4	15
SS 8641	62.2	4	59.2	15	44.5	12
SS 8302	62.0	5	60.6	11	37.0	39
DG V9723	61.1	6	56.7	21	39.5	32
Pioneer 26R12	61.0	7	63.5	7	45.7	9
SS 520	60.9	8	55.9	24	38.5	36
Coker 9700	60.6	9	59.5	14	42.2	21
Magnolia	59.8	10	60.2	13	39.7	28
Pioneer 26R31	59.5	11	58.3	19	43.9	17
Neuse	58.9	12	55.8	25	40.1	27
DG V9713	58.7	13	60.5	12	42.9	19
Coker 9184	58.5	14	58.7	16	43.6	18
SS 560	58.5	14	56.3	23	39.4	33
Coker 9436	58.3	15	58.4	18	46.6	6
USG 3209	57.3	16	53.0	27	39.5	29
Coker 9553	56.2	17	54.8	26	37.8	37
Pioneer 26R15	55.6	18	52.9	28	37.2	38
SS 8308	55.4	19	56.5	22	44.4	13
Pioneer 26R24	55.2	20	58.6	17	51.7	2
Coker 9804	53.5	21	49.8	31	41.4	23
Branson	53.2	22	50.8	29	34.3	45
Pioneer 26R61	51.1	23	49.7	32	35.2	44
DG Shirley			70.2	1	52.7	1
Oakes			67.5	2	44.4	14
Cape Fear			64.3	5	46.5	7
DG Baldwin			62.2	8	47.1	5
SS 5205			61.8	9	45.2	10
DG V9922			60.8	10	40.7	26
Yadkin			56.8	20	39.5	30
Panola			50.7	30	39.3	34
DG WX09612					51.2	3
Pioneer 26R22					46.0	8
B0400798					45.0	11
NC 19896					42.4	20
NC 19556					42.2	22
USG 3555					41.1	24
Pioneer 26R20					41.0	25
NC 22003					39.5	31
NC 19684					39.1	35
SS 8600					36.8	40
Pioneer 26R32					36.7	41
NC 20401					36.4	42
SS 8700					36.0	43
AVERAGE	58.8		58.7		42.0	

Table 2. Wheat Official Variety Performance, Beaufort County (Griffin Farm), 2010.
Courtesy Dr. Darly Bowman, NCSU.

Variety	Yield bu/a	Test Wt. lb/a	Variety	Yield bu/a	Test Wt. lb/a
DG Shirley	44.7	57.9	Coker 9804	37.6	58.1
USG 3592	43.5	60.1	Coker 9436	37.5	57.4
USG 3120	43.1	59.7	USG 3201	37.3	58.3
SS 8404	42.0	60.9	Pioneer 26R20	37.0	59.9
USG 3409	41.9	58.4	USG 3209	36.7	57.7
DG Baldwin	41.5	60.7	DG V9723	36.7	56.8
Terral TVX8861	41.3	60.7	USG 3438	36.6	59.5
Oakes	40.4	61.2	SS 8641	36.2	58.1
Pioneer 26R12	40.4	60.9	DG V9713	35.7	58.5
USG 3725	40.3	56.8	Pioneer 26R22	35.6	58.9
USG 3342	39.8	58.6	McCormick	35.5	59.9
SS 8302	39.7	60.0	Merel	35.1	59.3
Jamestown	39.5	59.5	SS MPV 57	35.1	59.5
DG Dominion	39.3	59.6	USG 3555	34.9	57.8
Coker 9553	39.1	59.2	SS 8600	34.5	59.3
USG 3665	38.9	58.1	Yadkin	34.4	58
SS 8700	38.4	58.6	Pioneer 26R15	34.4	57.8
AGS 2026	38.4	58.2	Terral TVX8581	34.2	57.8
SS 560	37.9	58.3	SS 8309	34.0	59.4
SS 5205	37.8	58.7	Roane	33.8	60.4
Pioneer 26R31	37.7	58.1	Terral TV8589	33.4	58.6
SS 5205	37.7	57.7	Pioneer 25R32	32.5	58.7
Cape Fear	37.7	59.1	Magnolia	32.5	58.9
AGS 2026	38.4	58.2	Panola	32.4	57.5
SS 560	37.9	58.3	Branson	32.1	52.1
SS 5205	37.8	58.7	Neuse	31.2	61.1
Pioneer 26R31	37.7	58.1	AGS 2031	29.7	59.9
SS 5205	37.7	57.7	DG 9922	29.6	59.9
Cape Fear	37.7	59.1			
			AVERAGE	37.0	58.8

Wheat Variety Characteristics

Variety	Heading Date	Powdery Mildew	Leaf Rust	Hessian Fly Type-L	Barley Yellow Dwarf	Soilborne Wheat Mosaic	Wheat Spindle Streak	Head Scab	Stripe Rust
AgriPro Coker 9184	Late	MS	MS	Poor	F/P	MR	R	MS	MS
AgriPro Coker 9295	Med	MS	MR	Poor	Poor	MR	MR	S	MR
AgriPro Coker 9312	Med	S	MR	Good	-	R	R	MR	MS
AgriPro Coker 9436	Late	MR	-	-	-	MR	-	-	-
AgriPro Coker 9511	-	-	-	-	-	-	-	-	-
AgriPro Coker 9553	-	-	-		-	-	-	-	-
AgriPro Coker 9663	Early	S	MR	Poor	Good	S	MS	MS	MR
AgriPro Cooper	Late	S	MS	-	-	R	R	-	-
AgriPro Crawford	Early	MR	R	Fair	Fair	MR	MR	MS	MR
AgriPro Panola	Med	MR	MS	-	-	MR	MS	-	-
NC Neuse	Late	R	MR	Good	F/P	R	MS	MR	MS
Roane	Late	S	S	Good	Good	MS	R	MR	MS
McCormick	Med	R	MR	Fair	-	MR	R	MR	MS
Pioneer 26R12	Med	MR	MR	Good	F/P	MR	R	MS	MS
Pioneer 26R15	Med	MR	MR	Good	-	MR	R	MR	MR
Pioneer 26R24	Med	S	MS	F/P	F/P	MR	MR	S	S
Pioneer 26R31	Early	R	-	-	-	MR	-	-	-
Pioneer 26R38	Early	MS	MS	Good	-	MR	MS	-	-
Pioneer 26R58	Med	MS	MR	Poor	-	MR	R	-	-
Pioneer 26R61	Med	MS	MR	Good	F/P	MR	R	S	MR
SS 520	Early	MR	MS	Poor	Good	MR	R	MS	S
SS 535	Late	MR	S	F/P	Fair	-	R	S	MS
SS 550	Med	MS	S	Poor	G/F	MS	R	MS	S
SS 566	Late	R	MS	F/P	F/P	-	MR	MS	MS
SS 8302	Med	S	MS	Fair	-	MR	-	MR	R
SS 8308	Med	R	MS	-	-	R	-	-	-
SS 8309	Late	MR	MS	Poor	-	S	-	MR	S
SS 8404	-	-	-	-	-	-	-	-	-
SS 38306	-	-	-	-	-	-	-	-	-
SS MPV 57	Late	MS	MS	-	-	R	-	-	-
Vigoro 9412	-	-	-	-	-	-	-	-	-
Vigoro 9510	-	-	-	-	-	-	-	-	-
Vigoro Dominion	-	-	-	-	-	-	-	-	-
Vigoro McIntosh	-	-	-	-	-	MR	-	-	-
Vigoro Tribute	Med	R	MS	G/F	G/F	S	MR	MR	MS
USG 3209	Med	MR	S	Fair	Fair	R	R	MS	MR
USG 3592	Med	MS	MR	Poor	-	MR	R	S	MS
USG 3706	-	-	-	-	-	-	-	-	-

S, MS, MR, and R stand for Susceptible, Moderately Susceptible, Moderately Resistant, and Resistant, respectively.

Based on all available information. Contributors include Drs. C. Cowger (USDA-ARS); P. Murphy and R. Weisz (NCSU)

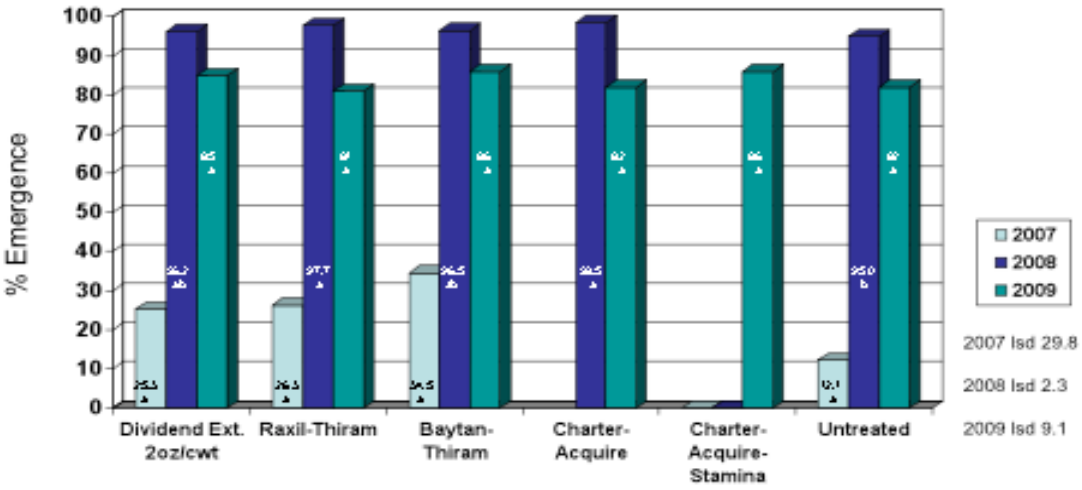
Wheat Seed Treatments

Seed treatments can be divided into two general categories: standard fungicidal seed treatments and specialty seed treatments. Standard seed treatments are inexpensive, +/- $1.50 per 50 pounds of seed, and are effective against a broad spectrum of problems including seed decay, seedling diseases that reduce plant stand, and loose smut. These treatments may also be highly effective against problems that are most likely to occur in cold wet soils and are also more problematic in no-till. Specialty seed treatments which cost +/- $3.50 or more per 50 pounds of seed, include fungicides or insecticides that are targeted at specific pest problems, such as powdery mildew, Hessian fly, or barley yellow dwarf virus.

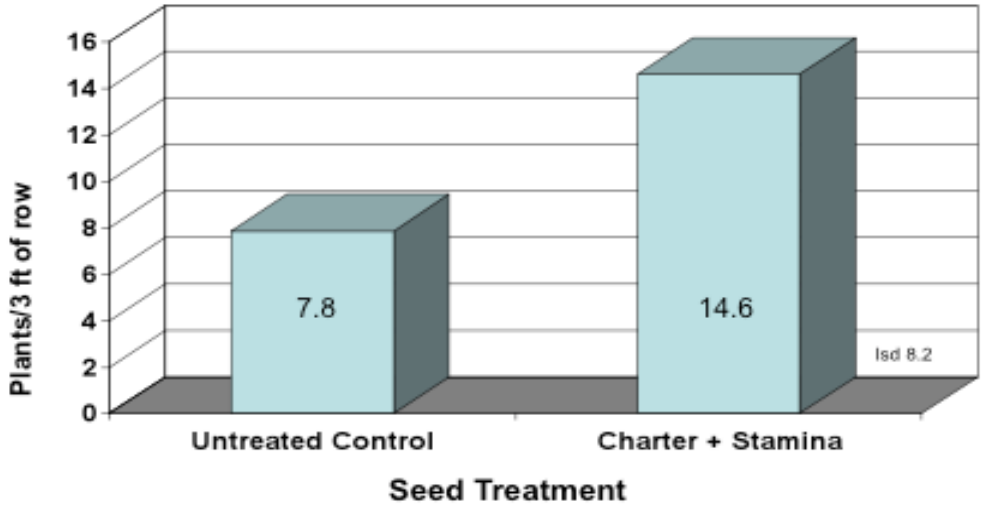
Standard and specialty wheat seed treated were evaluated for stand emergence in 2007-10 on Griffin Farms, Howell Farms, Foxfire Farms and 3B Farms. In general, all seed treatments improved plant stand when compared to the untreated control (Graph ST1). Specialty seed treatments, Baytan-Thiram and Dividend Extreme @ 4 oz/cwt, reduced the severity of powdery mildew on a Coker 9663, a susceptible variety at Foxfire Farms in 2008. Standard fungicidal seed treatments did not significantly reduce the severity of powdery mildew. In the three of the last four years, fungicide seed treatments made no significant impact in improving wheat yields in the plots on 3B Farms, Foxfire Farms or Howell Farms.

Fungicide and insecticide seed treatment on-farm-test results for 2010 can also be found in the Hessian fly section of this report.

Graph ST1. Impact of seed treatments on wheat emergence, 3B Farms 2007, Foxfire Farms 2008, and Howell Farms 2009, Beaufort County.



Graph ST2. Impact of fungicide seed treatment on wheat stand, Griffin Farm, Beaufort County 2009.



Charter (3.1 oz/cwt) + Stamina (0.4 oz/cwt) was applied to SS 8404. Planted Nov. 9, followed by a 9 inch rain event. Stand counts were taken 20 day after planting.

Foliar Fungicide Tests

In 2010 two foliar fungicide trials were conducted on Griffin Farms. A foliar fungicide test was conducted to evaluate the impact of seven fungicides on wheat yield among three varieties. The varieties were selected based on their disease resistance. Neuse was selected because of its good resistance to powdery mildew and leaf rust. Magnolia was selected because of its susceptibility to powdery mildew and head scab. McCormick was selected because of its susceptibility to leaf rust. The trial was planted on November 6 and replanted due to too much rain on November 29. The foliar fungicides included Headline (8 oz/a), Twinline (9 oz/a), Caramba (14 oz/a), Stratego (10 oz/a), Tilt (4 oz/a), Quadris (10 oz/a), Quilt (14 oz/a), and an untreated control. All of the fungicides were applied April 28. At the time of application, all three varieties were below thresholds for powdery mildew and leaf rust. All fungicides were applied with a CO_2 backpack sprayer using 80015 nozzles and delivering 15 gallons of spray per acre.

In 2010 fungicide application produced no significant positive impact on wheat yield among the three varieties (Graph F1).

In 2010 a second foliar fungicide test was conducted to focus on head scab control. The wheat varieties were selected with a wide range of susceptibility to head scab. The varieties tested included Coker 9436, Dominion, Neuse, Pioneer 26R12, SS 520, SS 5205, and USG 3592. The fungicides Caramba and Prosaro were selected because of their reported activity on head scab. The fungicides were applied on April 30 using twin fan nozzles applying 20 gpa. Caramba and Prosaro were applied at 14 oz/a and 8 oz/a, respectively. Fungicide application had no significant impact on wheat yield (Graph F3). There was not a significant difference in yield among the varieties tested (Graph F4).

In 2009 a foliar fungicide test was conducted on Howell Farms in Terra Ceia. The plot design, varieties, and fungicides were the same as the Griffin Farm in 2010.
In 2009 there was a significant infestation of leaf rust on untreated McCormick (see graph F5). There was a significant improvement in yield of McCormick with the use of foliar fungicides (see graph F6). There was not a significant yield increase with the use of foliar fungicides with the absence of leaf rust on Neuse, the resistant variety. There was a significant infestation of head scab on untreated Magnolia. Caramba applied at

flowering significantly reduced the severity of head scab and significantly improved yield on Magnolia (see graphs F7 & F8).

In 2005-08 four on-farm-tests were conducted to demonstrate and evaluate five foliar fungicides for the control of powdery mildew and leaf rust. The varieties Coker 9663 and USG 3209 were used in 2005. Coker 9663 and McCormick were used in 2006-08. The foliar fungicides included Headline (8 oz/a), Quadris (8 oz/a), Stratego (10 oz/a), Tilt (4 oz/a), Quadris (10 oz/a) and Quilt (14 oz/a). Coker 9663 is susceptible to powdery mildew and USG 3209 and McCormick are susceptible to leaf rust.

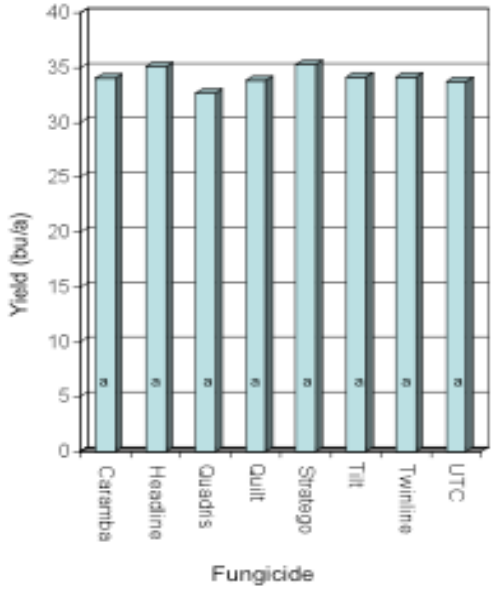
All fungicide treatments reduced the incidence and development of powdery mildew on Coker 9663 in 2005 and in 2008. Quadris, Headline, Quilt and Stratego significantly increase wheat yield in 2005 and Headline, Stratego and Quadris increased yield in Coker 9663 in 2008.

The disease severity was significantly less in the 2006 test. There was not a significant increase in wheat yield with the use of fungicides in 2006, however there was a trend toward increased yields with fungicide use.

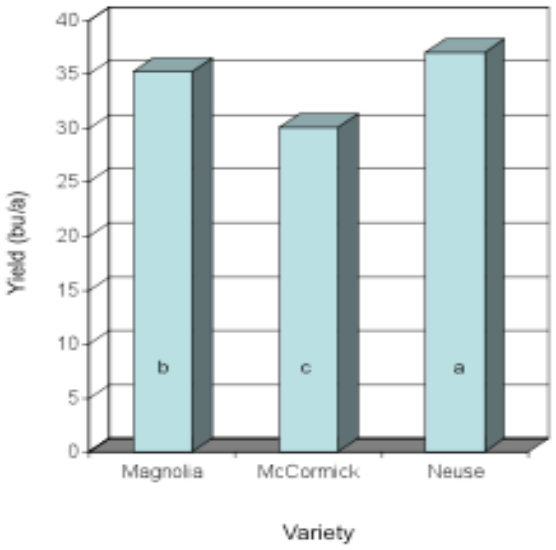
In 2007 the powdery mildew severity was too low to rate in either variety. There was a significant development of leaf rust on McCormick. All fungicides reduced the severity of leaf rust on McCormick and Headline, Quilt and Stratego significantly increased wheat yields. Coker 9663 did not develop a significant infestation of powdery mildew or leaf rust and the use of the foliar fungicides did not increase the yield.

In 2008 there was an above threshold infestation of powdery mildew on Coker 9663. All fungicide treatments reduced the severity of powdery mildew on Coker 9663 and there was a trend for higher yields with all fungicide treatments with Quadris, Stratego and Headline providing a significant increase in wheat yield. The McCormick remained below the threshold for treatment for powdery mildew and leaf rust and fungicide treatment did not provide a significant increase in wheat yield.

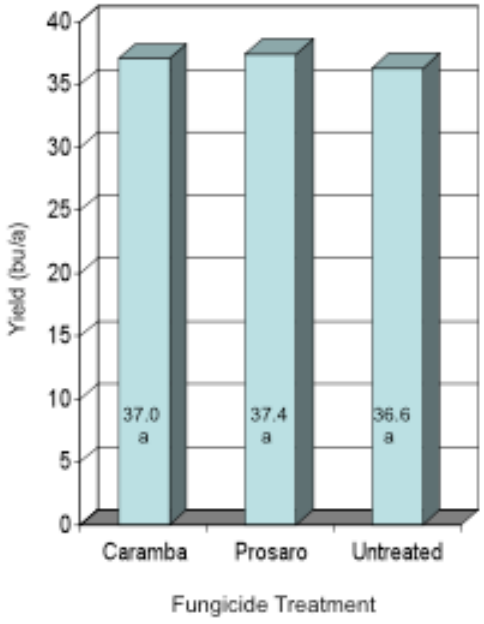
Graph F1. Impact of foliar fungicide on wheat yield, Griffin Farm, Beaufort County 2010.



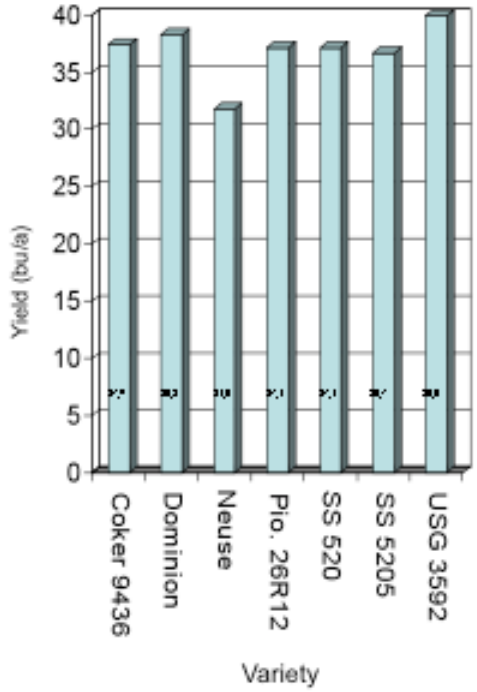
Graph F2. Impact of wheat variety performance in foliar fungicide trial, Griffin Farm, Beaufort County 2010.



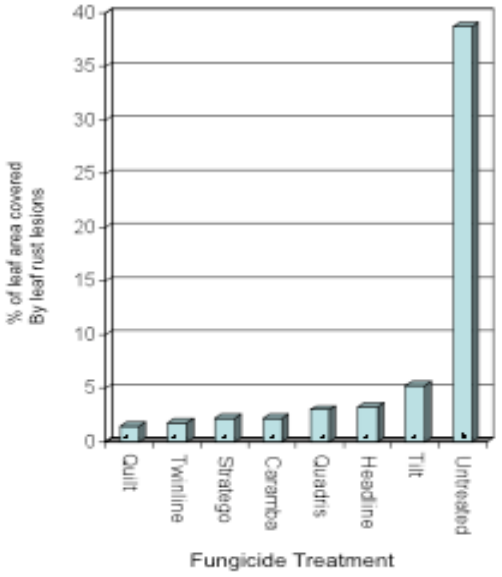
Graph F3. Impact of foliar fungicides on wheat yield, Griffin Farms, Beaufort County 2010.



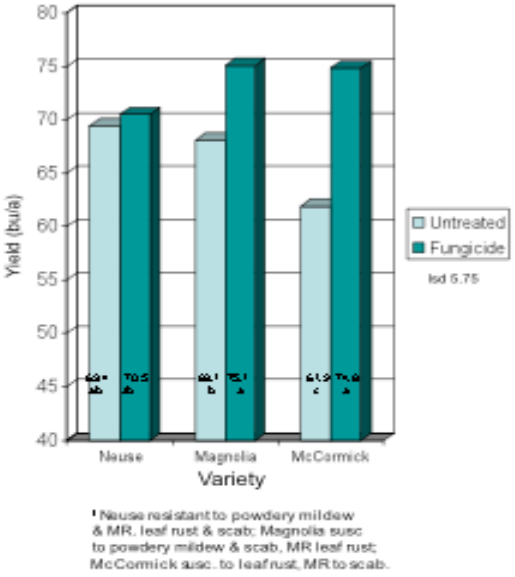
Graph F4. Wheat variety performance in fungicide Test, Griffin Farms, Beaufort County2010.



Graph F5. Impact of fungicides on reducing the severity of leaf rust in wheat (McCormick) Howell Farms, Beaufort County 2009.



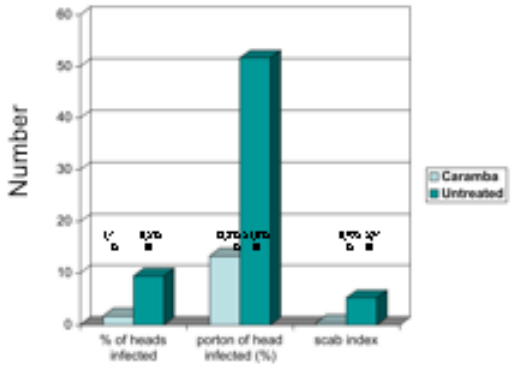
Graph F6. Impact of fungicides on wheat yield in disease resistant and disease susceptible varieties[1], Howell Farms, Beaufort County 2009.



[1] Neuse resistant to powdery mildew & MR. leaf rust & scab; Magnolia susc to powdery mildew & scab, MR leaf rust; McCormick susc. to leaf rust, MR to scab.

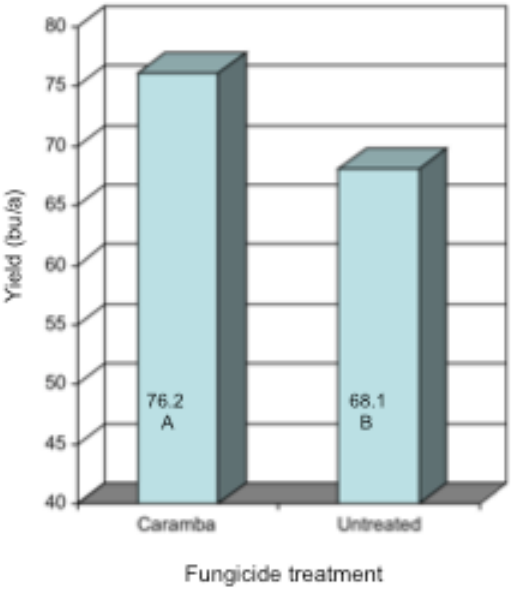
Impact of Caramba[1] on scab severity and yield in wheat[2], Howell Farms, Beaufort County 2009.

Graph F7.



Scab measurements

Graph F8.



[1] Caramba applied at anthesis
[2] wheat variety = Magnolia

Hessian Fly Control Tests

In 2009-10 three on-farm-tests were conducted to evaluate seed treatments, three on-farm-tests to evaluate foliar insecticides and their timing of application, and a variety on-farm-test to evaluate Hessian resistance on 3B Farms in the Vann Swamp Community.

In 2009-10 insecticide seed treatments had a clear advantage over fall insecticide application in controlling Hessian fly. Gaucho and Cruiser reduced the percentage of tillers infested by Hessian fly pupae in Panola, the susceptible variety, and to a lesser extent in Neuse, a resistant variety (Graph HF1 and Graph HF2). Gaucho and Cruiser also provided a significant improvement in yield by controlling the fall infestation of Hessian fly (Graph HF2). This on-farm-test also demonstrated the value of variety resistance. Neuse, a resistant variety, escaped a heavy infestation of Hessian fly and yielded significantly more than Panola, a susceptible variety.

There was a sharp difference in the performance of fall applications of insecticides to control Hessian fly in 2009 versus 2008. In 2008 the early fall applications (19 days after planting) of Warrior significantly reduced the infestation of Hessian fly and improved crop yield in the susceptible variety (Coker 9553), whereas the insecticidal seed treatments (Gaucho and Cruiser) had no impact in reducing Hessian fly infestation or crop yield. There reverse occurred in 20009-10. The insecticidal seed treatments significantly reduced the severity of Hessian fly infestation and increased crop yield versus the fall foliar application insecticides which had little or no impact. One possible explanation for the reduced effectiveness of the fall applied foliar insecticides has to do with timing. The application of the foliar insecticides was delayed to 26 days after planting, due to a prolonged rainy weather system. At this point, a significant number of Hessian flies had laid their eggs, hatched, and the larvae had made their way down the wheat stalk and were feeding behind the protective leaf sheath where they were beyond the reach of the foliar insecticides.

Insecticidal seed treatments in all three on-farm-test in 2009-10 significantly reduced Hessian fly infestations and improved crop yield (Tables HF1, HF2, and Graph HF1).

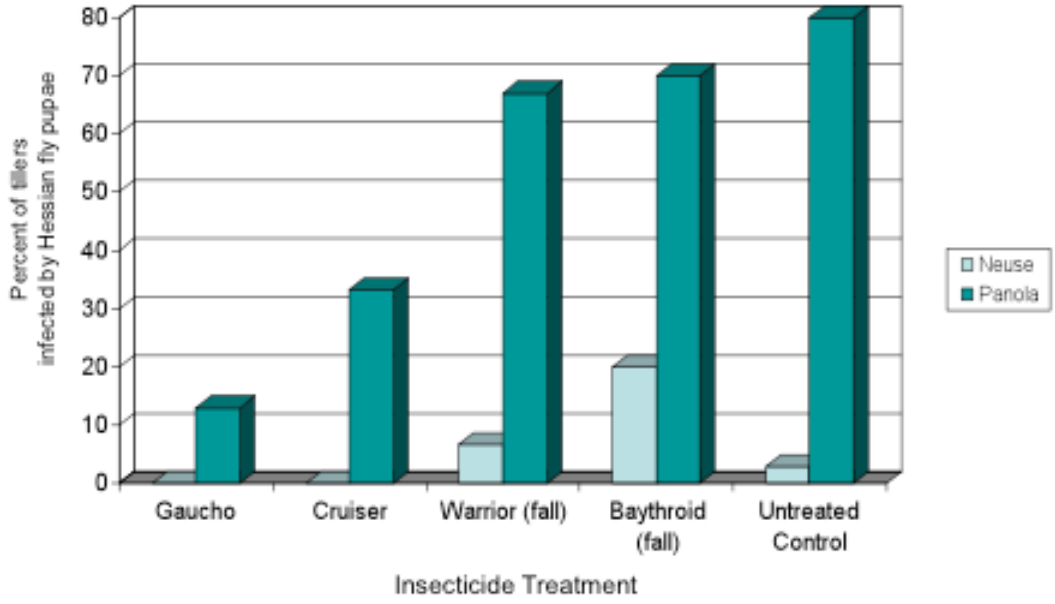
In 2010 the impact of the timing of the spring insecticide application was not as clear as in prior years (Graph HF3 and Table HF3). A trial was conducted to evaluate several

foliar insecticides and rates. The insecticides were applied March 25 and provided no improvement in crop yield.

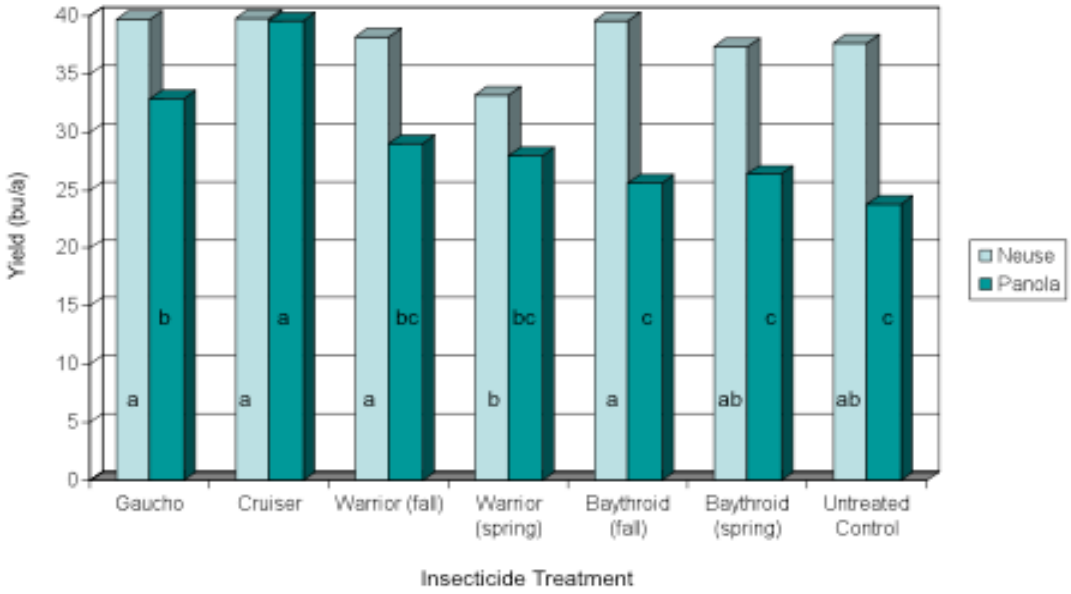
A trial was conducted evaluating the timing of the spring application in 2010. Numerically the March 31 treatment date yielded more, but not significantly different from the March 1 and March 15 treatment dates. Based on the findings of this test and four prior years of on-farm-tests, plus other field observations, it appears the most ideal time of insecticide application to control spring generations of Hessian fly in our area is from March 10 through March 20.

Nineteen varieties were evaluated for Hessian fly resistance (Table HF4). Varieties displaying good Hessian fly resistance included NC 22003, Pioneer 25R32, Pioneer 26R12, Baldwin, NC 20401, Pioneer 26R20, and Neuse.

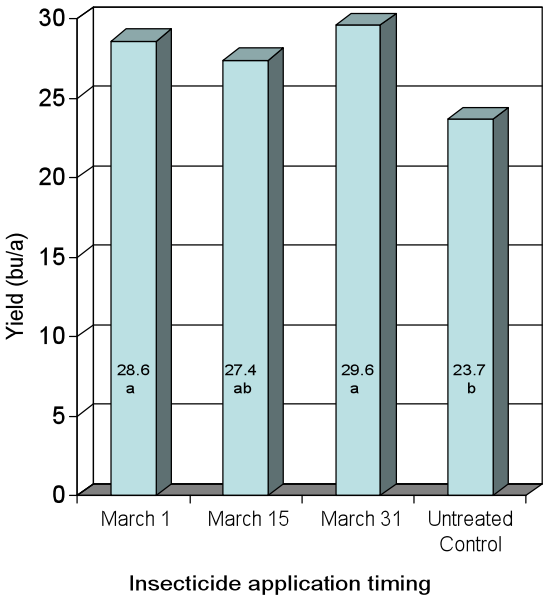
Graph HF1. Impact of insecticide seed treatments, foliar insecticides and variety resistance on Hessian Fly control, 3B Farms, Beaufort County 2010.



Graph HF2. Impact of insecticide seed treatments, foliar insecticides and variety resistance on Hessian Fly control and wheat yield, 3B Farms, Beaufort County 2010.



Graph HF3. Impact of timing of spring insecticide application for Hessian fly control and the impact on wheat yield, 3B Farms, Beaufort County 2010.



Graph HF4. Impact of spring application of Warrior and Bayhroid on Hessian fly control and wheat yield, 3B Farms, Beaufort County 2010.

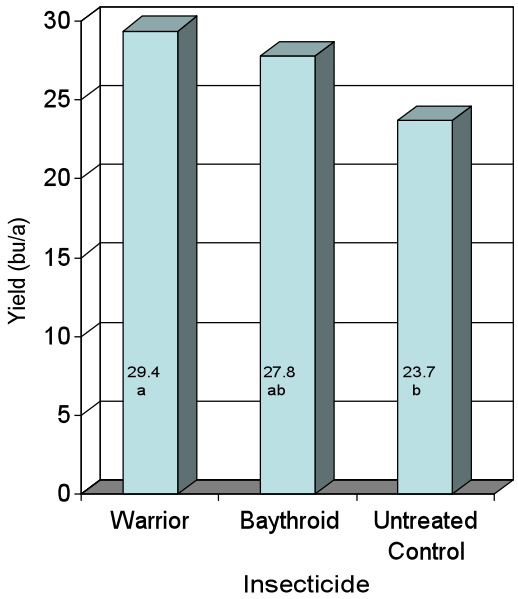


Table HF1. Impact of fungicide and insecticide seed treatments on plant stand, Hessian fly infestation, and crop yield, 3B Farms, Beaufort County 2009-10.

Seed Treatment	Rate	% of Plants Infected by Hessian Fly[1]	Plants per Foot of Row[1]	Yield (bu/a)
Untreated	-	80a	19.8a	26.5 c
V-10305 (exp. Fungicide)	-	70a	17.4a	25.3 c
V-10305 + Gaucho	- 1.2 oz/cwt	0b	17.8a	41.0 a
V-10305 + Gaucho	- 2.4 oz/cwt	0b	19.1a	40.0 a
V-10305 + Nips IT	- .75 oz/cwt	0b	18.1a	35.0 ab
V-10305 + Nips IT	- 1.2 oz/cwt	0b	18.8a	35.8 ab
V-10305 + Nips IT	- 1.5 oz/cwt	0b	18.5a	36.5 a
V-10305 + Nips IT	- 2.4 oz/cwt	0b	18.1a	41.0 a
V-10305 + Nips IT + Belay (Spring)	- 1.5 oz/cwt + 6 oz/a	0b	17.8a	38.8 a
V-10305 + Belay (spring)[2]	- 6 oz/a	-	19.6a	29.3 bc
V-10305 + Warrior (spring)[2]	- 3.84 oz/a	-	17.0a	36.0 ab

[1] Rated Nov. 19 (28 days after planting); Variety Coker 9553.

[2] Spring insecticide treatments applied March 25.

Table HF2. Impact of fungicide and insecticide seed treatments on plant stand, Hessian fly infestation, and crop yield, 3B Farms, Beaufort County 2009-10.

Treatments	Rate	% of Plants Infected by Hessian Fly[1]	Plants per Foot of Row[1]	Yield (bu/a)
Dividend	2 oz/cwt	45	15.3	33.1 c
Dividend + Cruiser 5FS	2 oz/cwt + 0.75 oz/ cwt	45	16.7	39.2 ab
Dividend + Cruiser 5FS	2 oz/cwt + 1.33 oz/ cwt	15	16.3	42.5 a
Fungicide alone	-	55	17.5	33.8 bc
Gaucho XT	3.4 oz/cwt	10	18.0	39.1 abc
Proceed MDW	5.0 oz/cwt	40	16.2	33.1 c

[1] Rated Nov. 19 (28 days after planting); Variety Coker 9553

Table HF3. Impact of spring applied foliar insecticides on Hessian fly and the impact on crop yield, 3B Farms, Beaufort County 2009-10.

Treatments	Rate (oz/a)	Yield (bu/a)
Endigo	4.5 oz	38.6 a
Karate Z	1.92 oz	38.0 a
Cobalt	16 oz	37.6 a
Baythroid XL	2.4 oz	34.3 a
Baythroid XL	1.8 oz	34.0 a
Untreated Control	-	32.9 a
Baythroid XL	1.0 oz	32.6 a

Variety Coker 9553.

Table HF4. Wheat variety resistance ratings to Hessian fly (visual health & tiller infestation) and crop yield, 3B Farms, Beaufort County 2009-10.

Variety	Visual Ratings[1]	% Tillers Infested by Hessian fly[2]	Yield (bu/a)
Pioneer 26R12	8.0 ab	7% fg	39.3 a
Baldwin	8.0 ab	7% fg	39.2 a
C 40798	7.3 abc	17% defg	37.5 ab
SS 8308	7.0 bcd	23% defg	34.8 abc
NC 22003	8.0 ab	0 g	34.4 abc
NC 20401	8.3 a	3% g	32.7 bcd
Pioneer 26R20	7.0 bcd	3% g	32.0 cde
SS 8700	5.0 gh	60% ab	30.4 cde
Pioneer 25R32	6.6 cde	0 g	28.0 def
Neuse	6.3 cdef	7% fg	27.5 efg
NC 19556	5.3 fgh	17% defg	25.1 fgh
NC 19896	5.0 gh	40% bcd	23.3 fghi
Oakes	5.6 efg	30% def	23.1 fghij
USG 3555	3.0 kl	67% a	22.6 fghij
SS 8600	3.0 kl	56% abc	22.5 ghij
Pioneer 26R22	3.3 jk	56% abc	21.2 hij
NC 19684	6.0 defg	63% ab	19.8 ij
Panola	1.0 m	76% a	18.5 ij
WX 09612	2.0 lm	70% a	17.8 j

[1] Visual ratings, 10 = best growth; 1.0 = worst growth; rated Jan. 16, 2010.
[2] Percent of tillers infested by one or more Hessian fly pupae; Rated Feb. 9, 2010.

Intensive Wheat Production Systems and Profit

Wheat farmers and agricultural scientists are continually striving to increase yield and readily adopt practices that increase profits. At the request of several growers and consultants, several production practices were evaluated separately and as an intensive production system. The intensive production practices evaluated included early broadleaf herbicide application with water, band applications of topdress nitrogen with streamer bars, nitrogen rate, popup fertilizer, varied seeding rate, seed treatments, and foliar fungicides (Table IS1).

Table IS1. Comparison of intensive production practices and conventional production practices and the cost.

Intensive System	Conventional System	Increase Cost/Acre
a. seeding rate (350 live seed/yd^2) b. fungicide & insecticide seed treatment c. popup fertilizer (5 gpa of 11-37-0) d. fall herbicide application with water e. UAN applied using streaming bars (2009), UAN rate (2010). f. foliar fungicide	a. 120 lb/a of seed b. untreated seed c. no popup fertilizer d. herbicide tankmixed with UAN e. broadcast UAN application; $7.50/a for 30 lb/a of N. f. no foliar fungicide	a. 0 b. $3 to $9/a c. $33.00/a d. $4.00/a app.cost e. 0 f. $17.00 fungicide Increased cost of intensive practices +/- $60.00/acre (2009) $67.50/acre (2010)

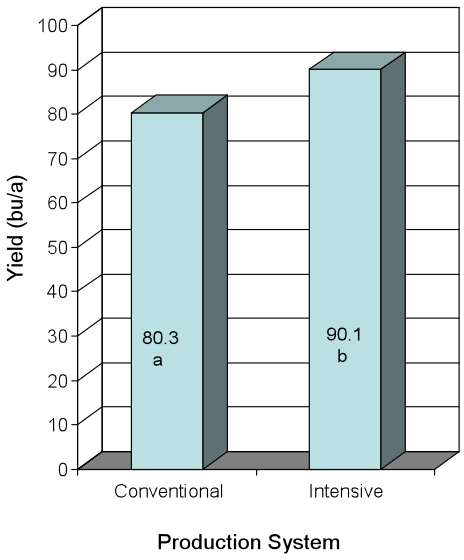
On-farm-tests were conducted evaluating various production practices. Popup fertilizer has been included in four on-farm-tests and the results are unclear when compared to broadcast phosphorous fertilizers. It appears that popup phosphorous applications are equal to broadcast phosphorous applications and appear significantly

better in increasing tillers and yield when compared to no phosphorous fertilizer application even in soils testing high in phosphorous in 2009.

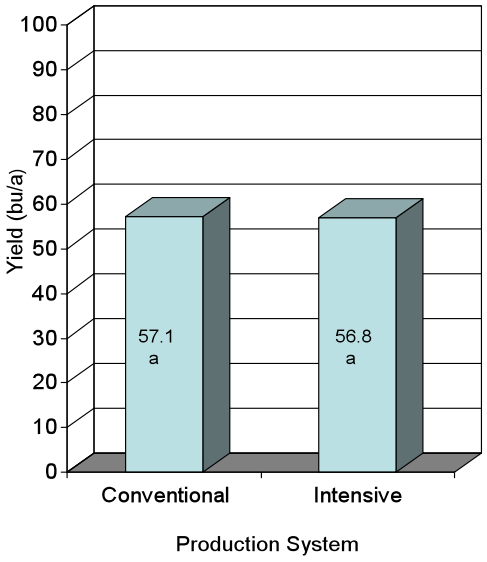
Herbicide application with water did not differ in yield compared to herbicide being tankmixed with UAN. The use of streamer bars applying topdress nitrogen had no impact on wheat yield in 2009.

All components of the intensive management systems were compared to a conventional system. The variety Neuse was used in 2009 and SS 8404 was used in 2010 in the production system comparison. The intensive production practices significantly increased wheat yield in 2009. The intensive production system produced approximately a 10 bushel per acre increase in yield. This increase in crop yield produced breakeven revenues when the extra costs of the intensive system were subtracted. There was no significant difference in wheat yield between the two production systems in 2010.

Graph IPS1. Impact of production management system on wheat yield, Howell Farms, Beaufort County 2009.



Graph IPS2. Impact of production management system on wheat yield, Griffin Farms, Beaufort County 2010.



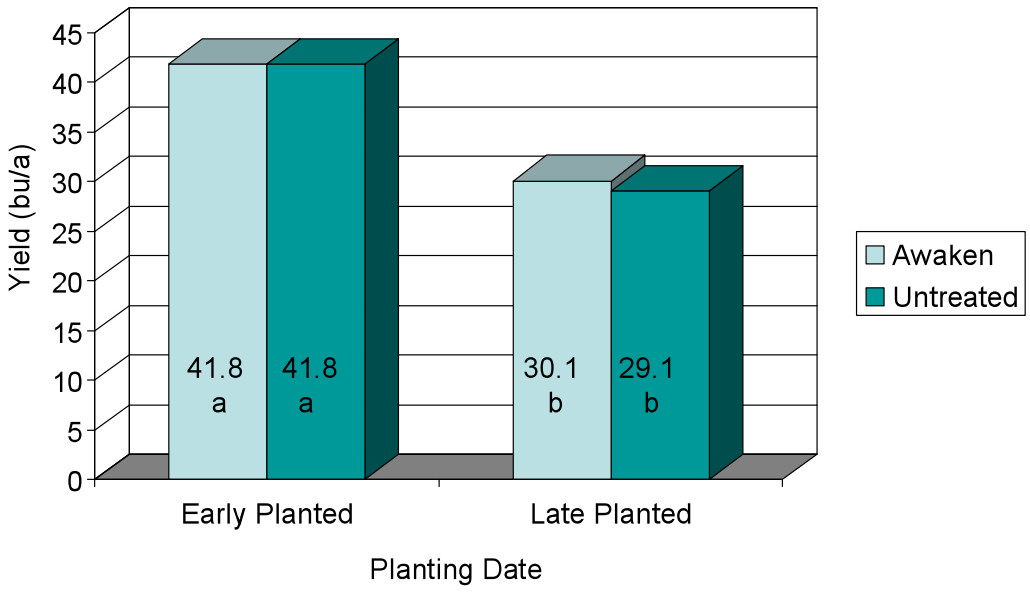
Specialty Fertilizer Tests

Two on-farm-tests evaluating Awaken, a specialty fertilizer, were conducted on Griffin Farms in 2010. Awaken's nutrient analysis is 16-0-2. The nitrogen is composed of 5.7% ammoniacal nitrogen, 3.4% nitrate nitrogen, 6.9% urea nitrogen, and 2.0% soluble potash (K_20). In addition Awaken contains chelated copper (.15%), chelated iron (.15%), chelated manganese (.15%), chelated zinc (2.7%), and molybdenum (0.0006%). Awaken weights 10.2 pounds per gallon.

The two trials evaluated Awaken at two planting dates and two varieties. The early planting date was November 5 and the variety was Pioneer 26R12. The late planting date was November 29 and the variety SS 8404. The plot design for each planting date was a randomized complete block design with four replications. Awaken (2 qt/a) was sequentially applied along with topdress nitrogen (120 lb/a of N as UAN) on March 9.

The addition of Awaken to topdress nitrogen had no impact on wheat yield.

Graph SF1. Impact of the specialty fertilizer Awaken on wheat yield, Griffin Farms, Beaufort County2010.



Avail and Nutrisphere Fertilizer Additive Tests

Four on-farm-tests were conducted to evaluate the fertilizer additive Avail and two on-farm-tests were conducted to evaluate the fertilizer additive Nutrisphere in 2009-10. Avail is a dicarboxylic copolymer with a high cation exchange capacity used as a coating on granular phosphate or mixed into fluid P fertilizers to enhance P availability.
The Avail on-farm-tests were conducted on the Benson-Russ Farm in Pantego and on the Howell Farm in Terra Ceia in 2009 and on the Griffin Farm in 2010.

The Nutrisphere on-farm-tests were conducted on the Howell Farm in Terra Ceia in 2009 and on the Griffin Farm 2010. The soil class ranged from mineral to organic. The NCDA soil test phosphorous index would be considered high for each respective location.

Nutrisphere is generally the same structure as Avail and Nutrisphere is advertised to enhance season long nitrogen management by eliminating volatilization, nitrate leeching, and denitrification.

Avail was applied on diammonium phosphate (DAP 18-46-0) and broadcast prior to planting on each farm, but soil incorporated on the Benson-Russ Farm and the Griffin Farm. The Howell Farm location was no-till. Avail was also mixed with a fluid polyphosphate (11-37-0) or a fluid 3-18-18 and applied in-furrow as a popup fertilizer at planting at each location. The first observation was to record any negative impact on wheat emergence and stand with a popup fertilizer (in-furrow placement). The addition of 5 or 10 gallons per acre of 11-37-0 popup, with or without Avail, did not have an impact on crop stand.

At the Benson-Russ Farm location the broadcast phosphorous fertilizer treatment, with or without Avail, produced no significant difference in crop yield. There was no significant difference in yield between band fertilizer rates, with or without Avail (Graph FA1).

At the Howell Farm location the broadcast treatments with and without Avail were no different. At the lower rate of banded P_20_5 Avail is four bushels better. At the higher rate of banded P_20_5 Avail made no difference.

There were two on-farm-tests on evaluating Avail on the Griffin Farm in 2010. The first trial compared two fluid popup fertilizers (11-37-0 & 3-18-18) and a broadcast phosphorous fertilizer (DAP 18-46-0), each with and without Avail. Avail had no impact on wheat yield when applied with either phosphorous fertilizer material (Graph FA2).

The second trial evaluating Avail on the Griffin Farm was a split plot design where Avail was included in a nitrogen topdress trial with multiple rate nitrogen rates, with and without Nutrisphere. Avail, Avail plus Nutrisphere, and Nutrisphere did not have an impact on crop yield (Graph FA3).

Different topdress nitrogen rates, with and without Nutrisphere, were applied on an on-farm-test on Howell Farms in 2009 and on the Griffin Farm in 2010. On the Griffin Farm Nutrisphere trial, Avail was also included in a split plot design. Avail plus DAP was applied to half of each plot and DAP alone was applied to the other half of the plot. The DAP and DAP plus Avail was applied preplant incorporated and the Nutrisphere was applied in UAN at topdressing. There was no enhancement of wheat yields with the addition of Nutrisphere to UAN on the Howell Farm. On the Griffin Farm, there was no enhancement in wheat yield with Avail, Nutrisphere, or Avail plus Nutrisphere (Graphs FA4, FA5, Fa6 & FA7).

The rates and costs of Avail and Nutrisphere are reported in Table FA1.

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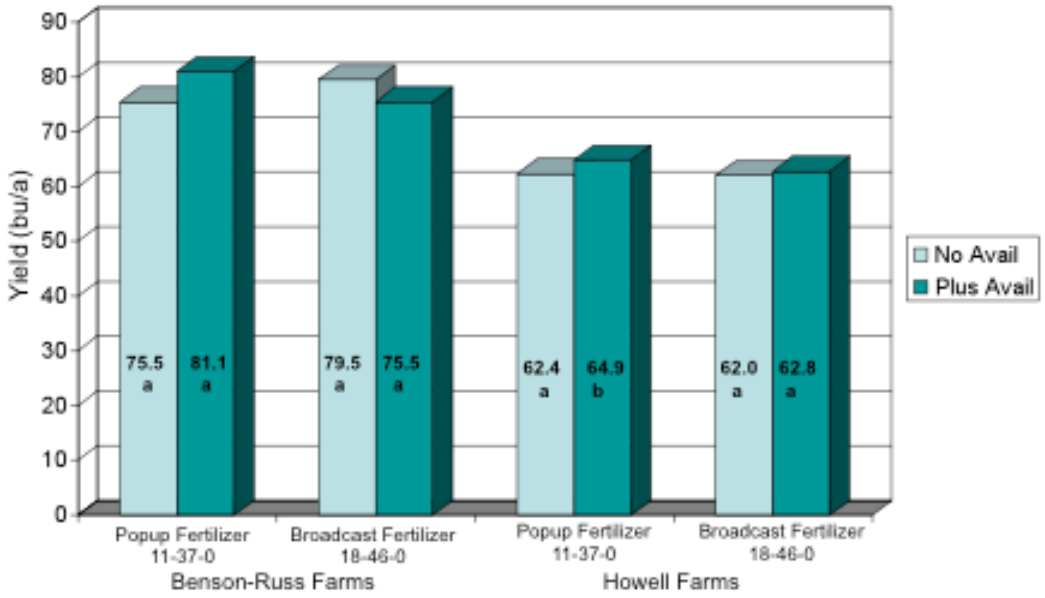
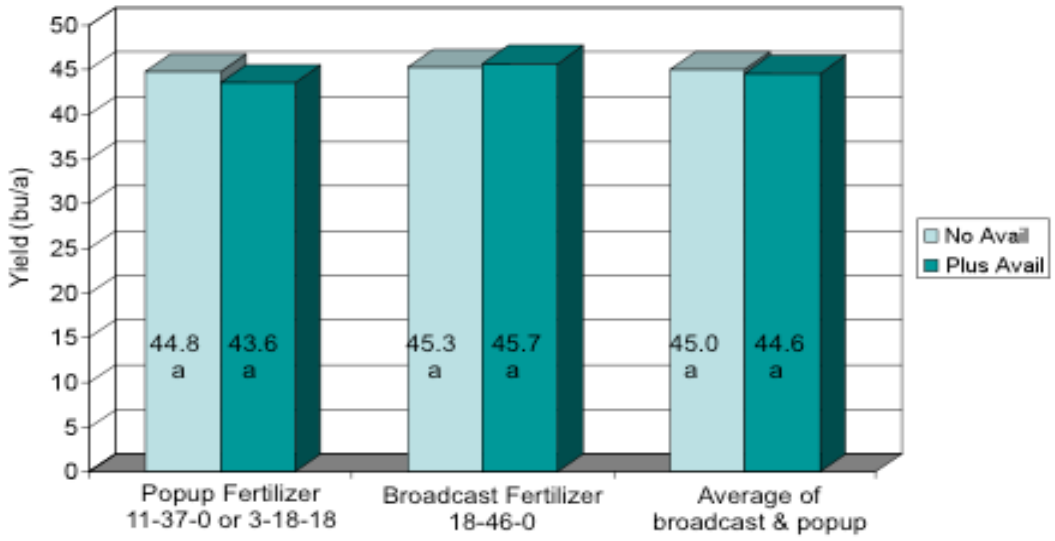
Table FA1. Rate per ton or 100 gallons, cost per unit and cost per acre of Avail and Nutrisphere.

Additive	Rate	Cost/unit	Cost per acre
Avail for granular P	½ gallon/ton	$115/ton or $.125/lb of P	$5.75 for 100 lb/a of DAP
Avail for fluid P	½ gallon/100 gallons	$.95/gallon or $.219/lb of P	$4.75/5 gpa of 11-37-0, $9.50/10 gpa of 11-37-0
Nutrisphere for UAN	½ gallon/ 100 gallons	$.375/gallon or $.0625/lb of N	$6.25 for 100 lb/a of N
Nutrisphere for Urea	½ gallon/ton	$67.50/ton or $.073/lb of N	$7.30 for 100lb/a of N

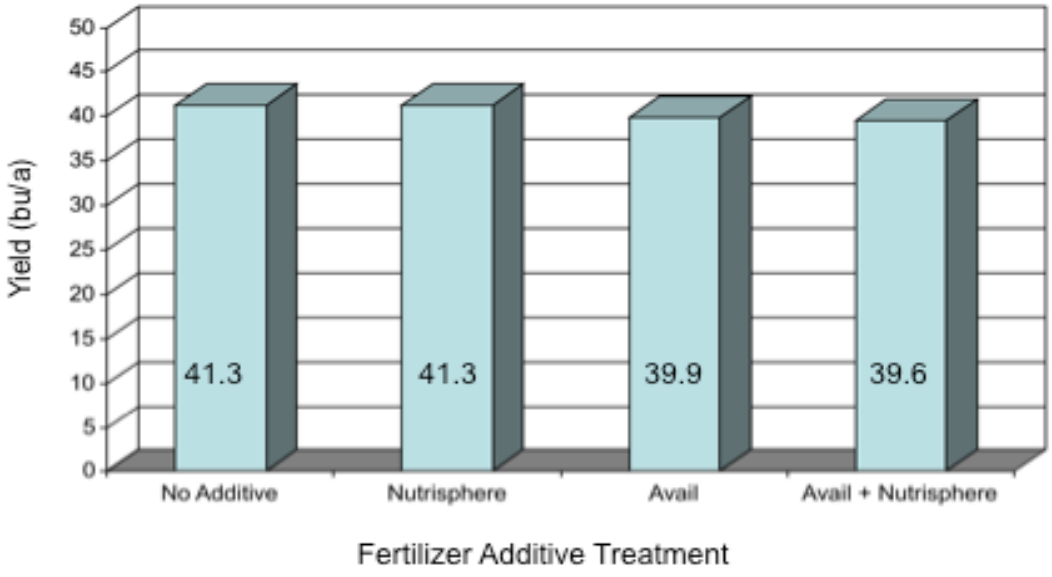
Graph FA1. Impact of Avail on wheat yield when applied on popup or broadcast phosphorous fertilizers, Benson-Russ Farms and Howell Farms, Beaufort County 2009.



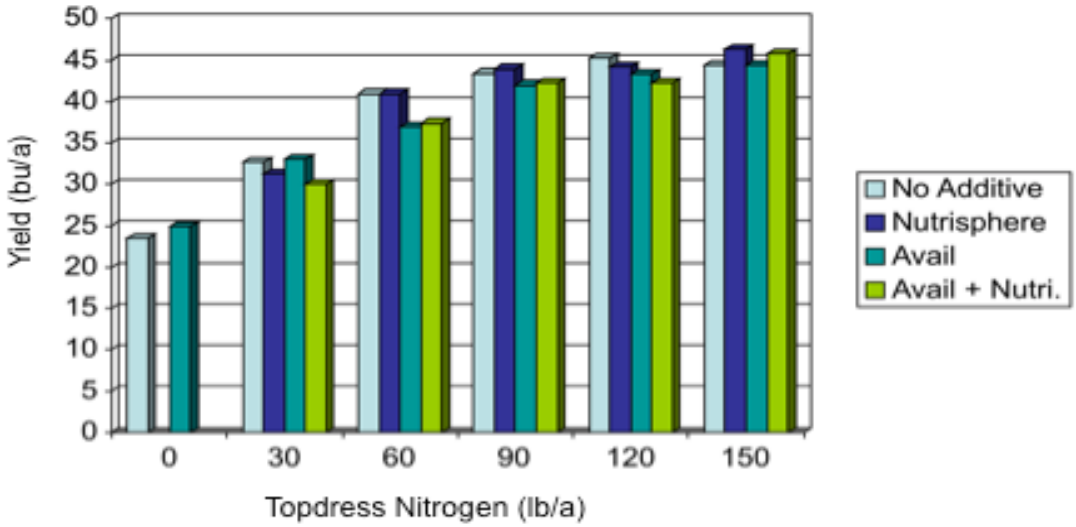
Graph FA2. Impact of Avail on wheat yield when applied on popup or broadcast phosphorous fertilizers, Griffin Farms, Beaufort County 2010.



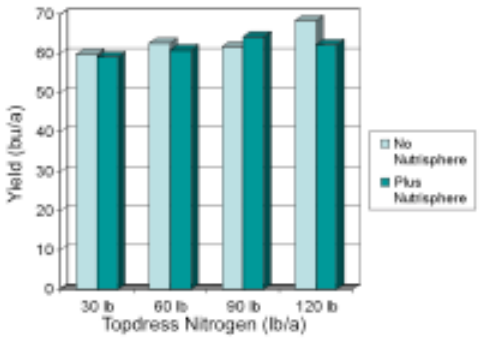
Graph FA3. Impact of fertilizer additives on wheat yield, Griffin Farm, Beaufort County 2010.



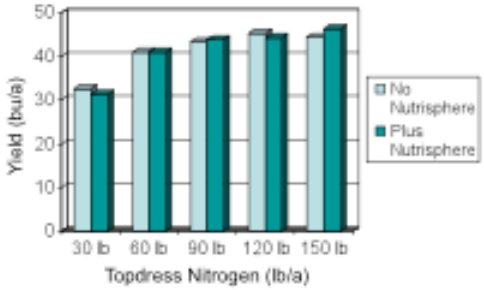
Graph FA4. Impact of topdress nitrogen rates with Nutrisphere and/or Avail, Griffin Farms, Beaufort County 2010.



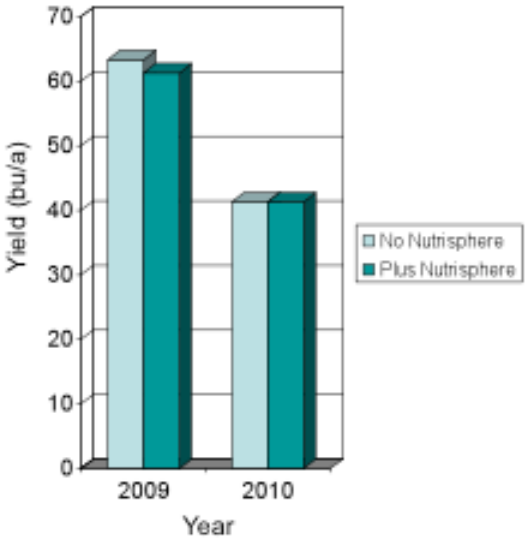
Graph FA5. Impact of Nutrisphere in topdress nitrogen on wheat yield, Howell Farms, Beaufort County 2009.



Graph FA6. Impact of Nutrisphere in topdress nitrogen on wheat yield, Griffin Farms, Beaufort County 2010.



Graph FA7. Impact of Nutrisphere in topdress nitrogen on wheat yield, Howell Farms 2009, Griffin Farms 2010, Beaufort County.

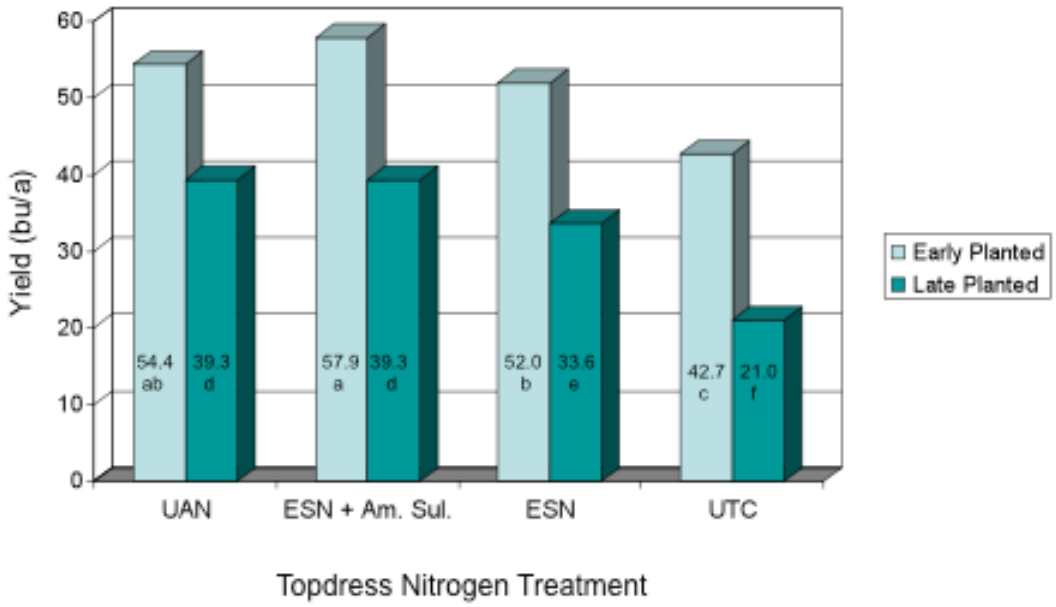


Topdress Nitrogen Source

Two on-farm-tests were conducted on the Griffin Farm to evaluate a slow release nitrogen fertilizer. The material, ESN, is a coated urea material containing 45% nitrogen. The recommendation for use of ESN is to combine it with ammonium sulfate in a ratio where 30% of the nitrogen comes from ammonium sulfate. All topdress nitrogen rates were 120 lb/a and the sources were 30% UAN, ESN, ESN + ammonium sulfate and an untreated control. The materials were applied March 9 in wheat from two planting dates, early and late. The early planting date was November 5 and the variety was Pioneer 26R12. The late planting date was November 29 and the variety was SS 8404. A randomized complete block plot design with four replications was used for each planting date.

The earlier planting date trial out yielded the late planting date. UAN and ESN + ammonium sulfate produced higher yields than ESN for both planting dates and each nitrogen material out yielded the untreated control (Graph N1).

Graph N1. Impact of topdress nitrogen source on wheat yield, Griffin farm, Beaufort County 2010.



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