Beaufort County Cooperative Extension
2011 Wheat On-Farm-Test Report

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To: Beaufort County Wheat Producers and Agribusinessmen

From: Gaylon Ambrose
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The 2011 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 Benson-Russ 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, 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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Table 1. Wheat Variety Performance, Beaufort County, 2009-11.

Variety	Three Year 2009-11 Yield (bu/a)	Three Year 2009-11 Yield Rank	Two Year 2010-11 Yield (bu/a)	Two Year 2010-11 Yield Rank	One Year 2011 Yield (bu/a)	One Year 2011 Yield Rank
DG Shirley	87.2	1	86.9	1	121.2	1
Oakes	84.8	2	81.6	2	119.4	2
DG Dominion	81.7	3	80.9	3	114.2	6
Cape Fear	79.4	4	78.1	5	109.7	14
SS 8404	78.9	5	75.9	13	107.7	26
Pioneer 26R12	78.8	6	77.6	7	109.6	15
SS 5205	77.9	7	77.7	6	110.3	12
Coker 9312	77.7	8	75.0	15	105.6	32
DG Baldwin	77.4	9	77.4	8	107.8	25
SS 8302	76.9	10	73.3	19	109.6	16
Coker 9700	76.0	11	75.6	14	109.1	18
SS 8641	75.7	12	76.7	10	108.9	19
SS 520	75.4	13	76.4	11	114.4	5
Magnolia	75.3	14	72.7	21	105.7	31
SS 560	75.2	15	76.3	12	113.2	7
SS 8308	74.3	16	77.2	9	110.0	13
Coker 9184	73.5	17	73.4	18	103.3	38
USG 3209	71.8	18	74.4	16	109.4	17
Yadkin	71.2	19	69.8	25	100.2	44
Coker 9553	71.1	20	70.8	22	103.9	36
Pioneer 26R15	68.7	21	68.7	28	100.3	43
Neuse	68.1	22	66.3	30	92.6	48
Panola	67.5	23	70.2	24	101.1	42
Branson	66.7	24	66.4	29	98.6	46
Coker 9804	65.2	25	68.8	27	96.2	47
SY 9978			80.5	4	116.1	3
Pioneer 26R22			77.2	9	108.5	23
SS 8700			74.2	17	112.5	8
USG 3555			72.1	20	103.2	39
Pioneer 25R32			71.4	22	106.2	29
SS 8600			69.6	24	102.4	41
USG 3120					114.9	4
W 1566					111.8	9
NC06-20401					111.7	10
SS 8340					110.7	11
DG 9053					108.8	20
DG 9171					108.6	21
DG 9042					108.6	22
SS 8500					108.5	23
USG 3409					107.5	27
DG 9012					106.3	28
Pioneer 26R20					105.8	30
USG 3592					105.6	33
USG 3665					104.9	34
Arcadia					104.4	35
Roane					103.6	37
NC05-19684					103.1	40
NC05-19896					100.1	45
Coker 9436					91.3	49
AVERAGE	75.0		74.6		107.1	

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.

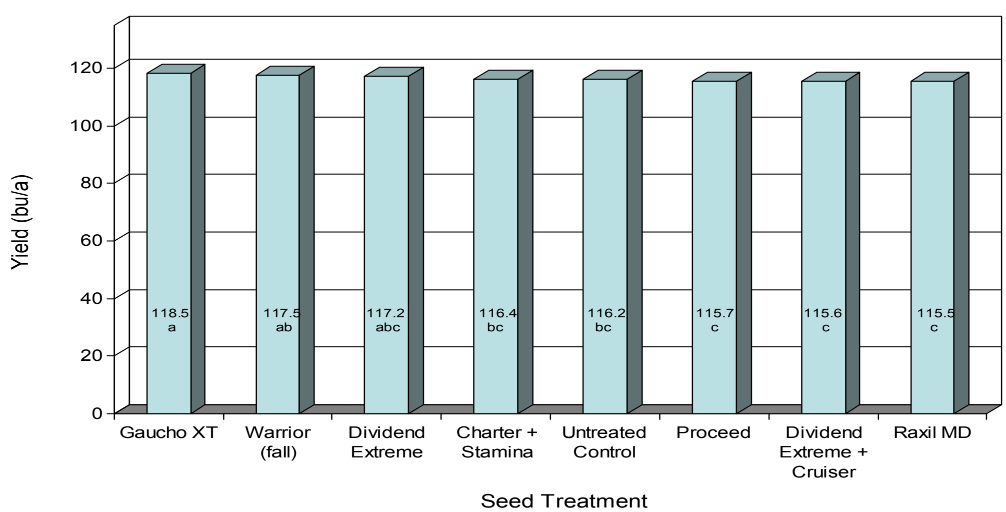
Based on all available information. Contributors include Drs. C. Cowger (USDA-ARS); P. Murphy and R. Weisz (NCSU)

Wheat Seed Treatments

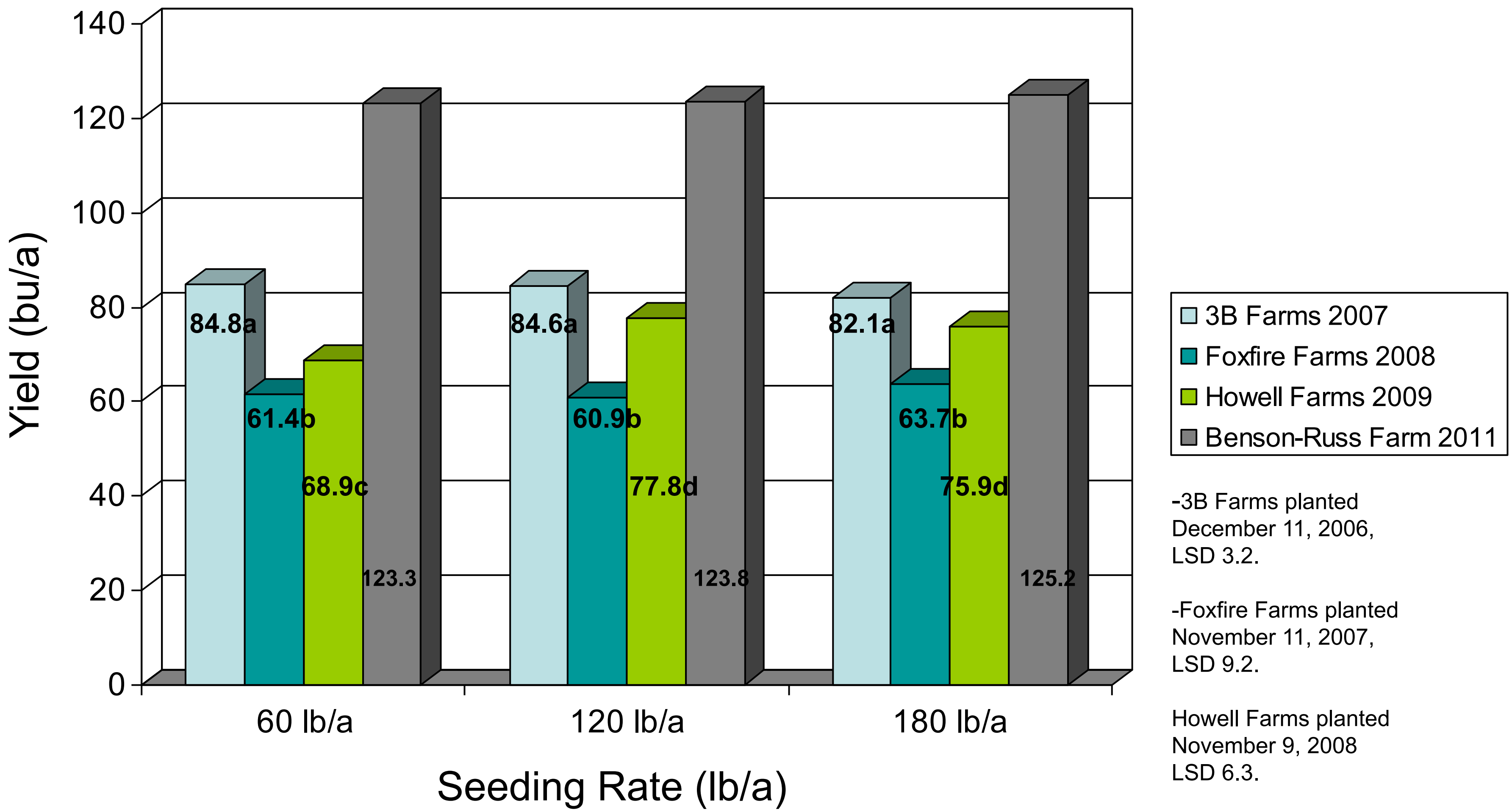
Seed treatments can be divided into two general categories: standard fungicidal seed treatments and specialty seed treatments. Standard seed treatments are inexpensive, +/- $1.50 per 50 pounds of seed, and are effective against a broad spectrum of problems including seed decay, seedling diseases that 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.

In 2011 a fungicide/insecticide seed treatment on-farm-test was conducted on Benson-Russ Farm. The variety was SS 8404. Gaucho XT, Warrior (fall), and Dividend Extreme produced more crop yield than Proceed, Dividend Extreme + Cruiser and Raxil MD. Gaucho XT was the only treatment yielding more than the untreated control. See Graph ST1.

Graph ST1. Impact of fungicide and insecticide seed treatments on wheat yield, Benson-Russ Farm, Beaufort County 2011.



Graph SR1. Impact of seeding rate on wheat yield, 3 B Farms 2007, Foxfire Farms 2008, Howell Farm 2009, and Benson-Russ Farms 2011, Beaufort County.



-3B Farms planted December 11, 2006, LSD 3.2.

-Foxfire Farms planted November 11, 2007, LSD 9.2.

Howell Farms planted November 9, 2008 LSD 6.3.

Benson-Russ Farms planted November 10, 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, poup 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) $73/acre (2011)

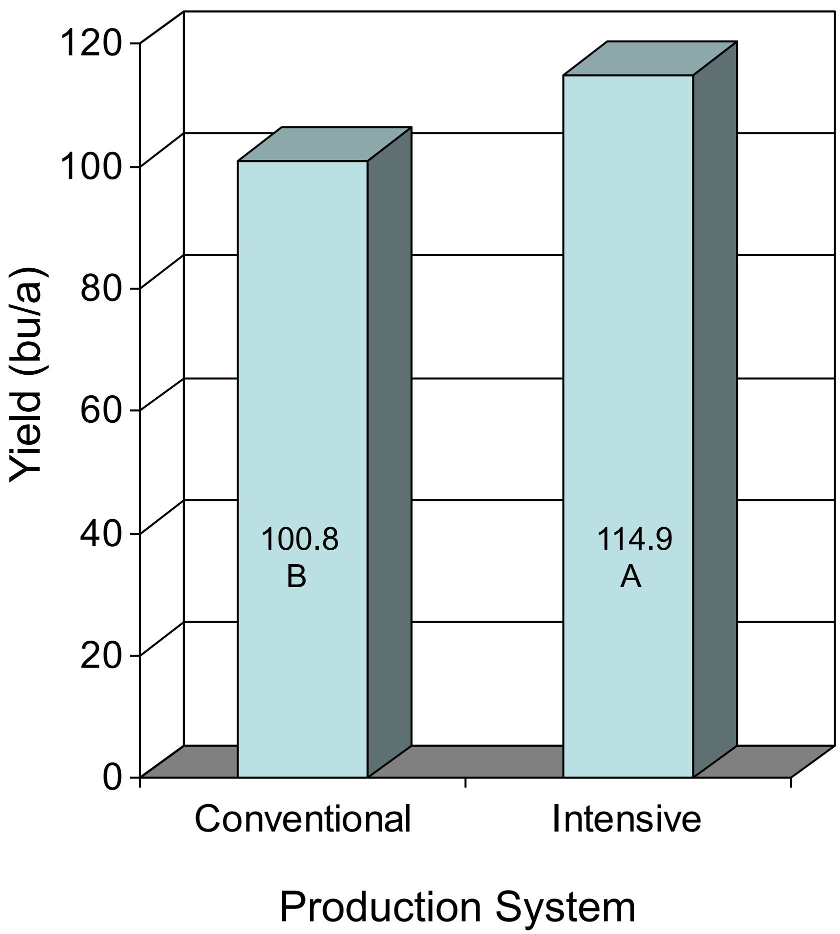
On-farm-tests were conducted evaluating various production practices. The findings of years of seeding rate trials are reported on page 4. The impact of seed fungicides have been reported in the wheat seed treatment section of this report. The impact of foliar fungicide has been reported earlier.

Popup fertilizer has been included in six 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 soils testing high in phosphorous in 2009 and 2011.

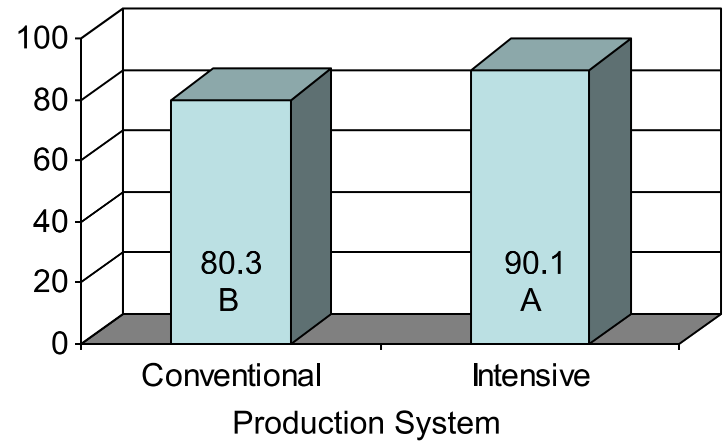
Herbicide application with water did not differ in yield compared to herbicide being tankmixed with UAN in 2009. The use of streamer bars applying topdress nitrogen had no impact on wheat yield in 2009. In 2010 and 2011 streamer bars were not used, instead the nitrogen rates were increased by 30 lbs/a for the intensive management treatment.

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 and 2011 in the production system comparison. The intensive production practices significantly increased wheat yield in 2009 and 2011. The intensive production system produced approximately a 10 bushel per acre and a 14 bushel per acre increase in yield in 2009 and 2011, respectively. This increase in crop yield produced breakeven revenues when the extra costs of the intensive system were subtracted in 2009. The intensive management inputs produced a net loss of income in 2010. There was no significant difference in wheat between the two production systems in 2010. In 2011 the intensive management system produced a significant increase in crop yield and profit when compared to the conventional management system.

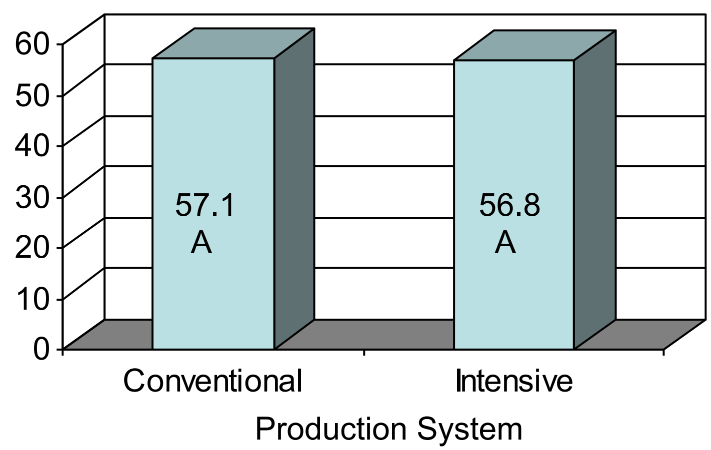
Graph IPS1. Impact of production management systems on wheat yield, Benson-Russ Farm, Beaufort County 2011.



Graph IPS3. Impact of production management Systems on wheat yield, Howell Farm, Beaufort County 2009.



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



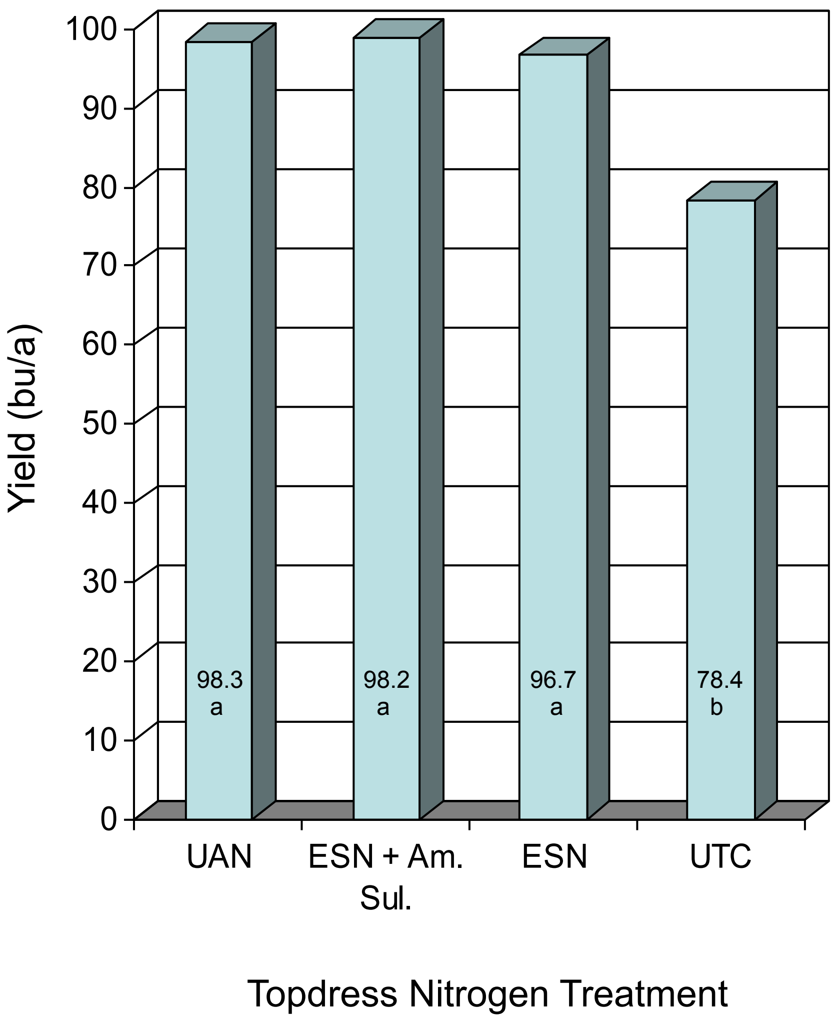
Topdress Nitrogen Sources

An on-farm-test was conducted on the Benson-Russ Farm in 2011 and two on-farm-tests were conducted on the Griffin Farm in 2010 to evaluate a slow release topdress nitrogen fertilizer. The material, ESN, is a coated urea material containing 45% nitrogen. The recommendation for the use of ESN is to combine 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.

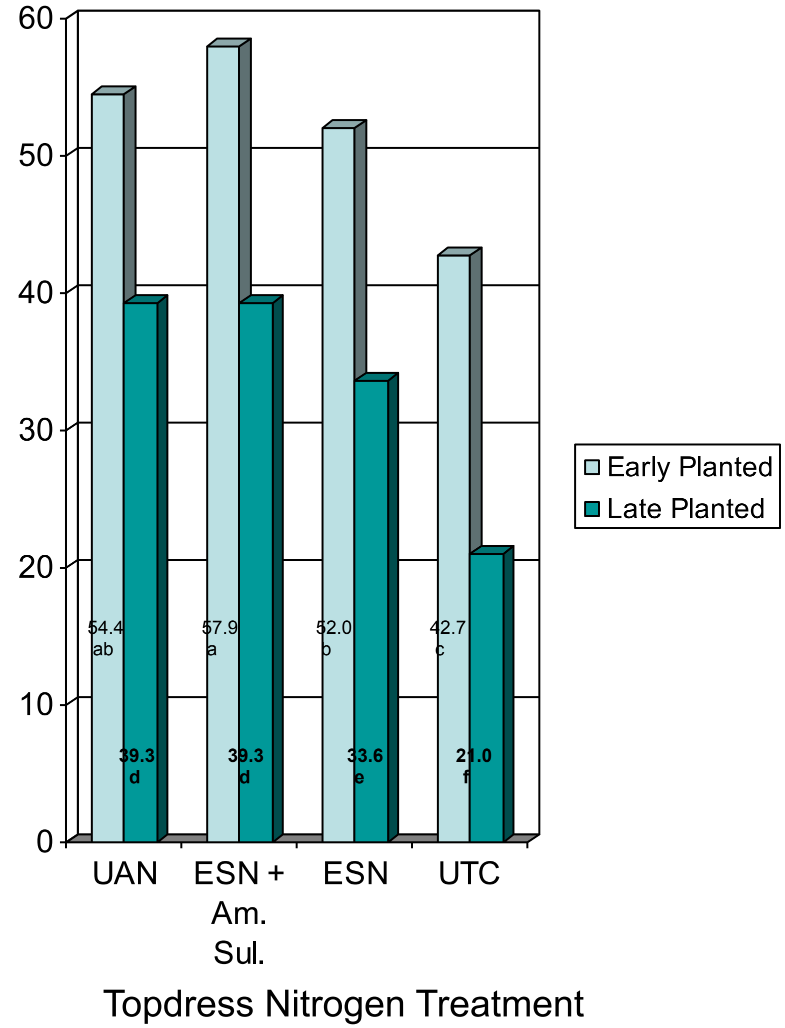
The 2009 planting dates were November 5 and November 29 and the 2010 planting date was November 12. The topdress materials were applied March 4 and March 9 in 2011 and 2010, respectively. The wheat variety was SS 8404 in 2010. A randomized complete block plot design with four replications was used in each on-farm-test.

In 2011 and in the early planted 2010 trial, there was no difference in wheat yield among topdress nitrogen materials (Graph N1). In 2010, in the late planted trial the UAN and the ESN + ammonium sulfate material performed significantly better than the ESN material. All materials out performed the untreated control (Graph N2).

Graph N1. Impact of topdress nitrogen sources on wheat yield, Benson-Russ Farm, Beaufort County 2011.



Graph N2. Impact of topdress nitrogen sources On wheat yield, Griffin Farm, Beaufort County 2010.



Specialty Fertilizer Tests

In 2011 an on-farm-test was conducted to evaluate Monty's 8-16-8 foliar fertilizer and Monty's Liquid Carbon on wheat on the Benson-Russ Farm. In 2009 an on-farm-test was conducted on the Howell Farm to evaluate Multicrop fertilizers. Multicrop materials included Liquid Carbon, 2-15-15 and 8-16-8. For a list of Multicrop treatments tested and their costs/acre go to Table FT4.

All treatments also received the base fertilizer program and all treatments received the same amount to topdress nitrogen. In 2009 visual ratings were made in late February to compare the impact of the Multicrop fertilizers to the base fertilizer program. There were no visual differences in crop growth among treatments (Graph FT2). Above ground growth was removed from three feet of row, oven dried and weighed from the control treatment and the treatment receiving Liquid Carbon @ ½ gpa preplant + 2-15-15 @ 24 oz/a + ½ gpa of Liquid Carbon in the popup fertilizer. There was no significant difference in above ground oven dry weight between treatments (Graph FT3). The Multicrop fertilizer treatments did not significantly increase wheat yield above the untreated control (Graph FT4). In general, the yield gain for each treatment above the yield of the untreated control was not enough to offset the cost of the Multicrop treatments.

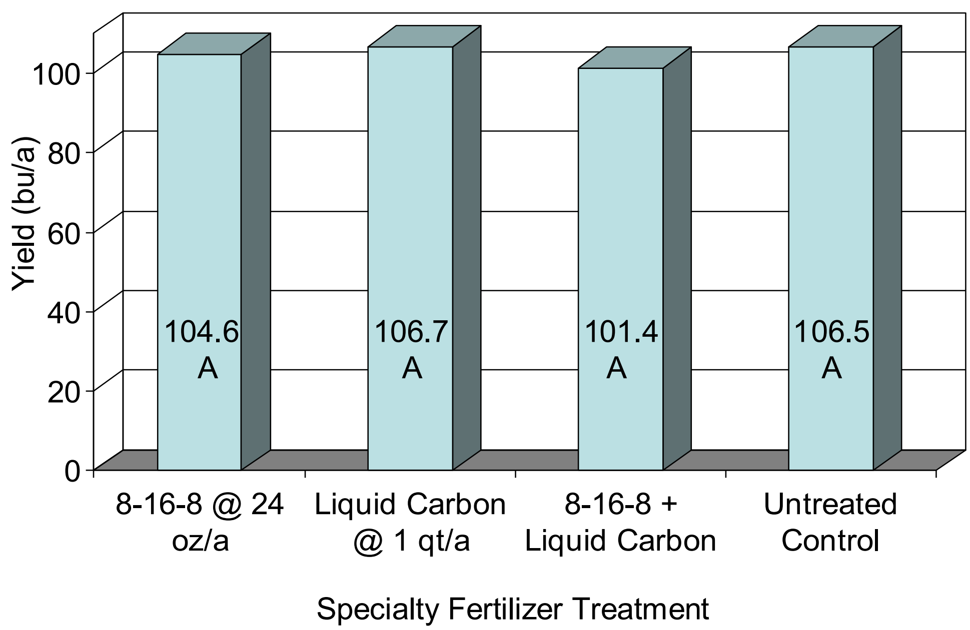
Table FT4. Multicrop fertilizer treatments, rate per acre and cost per acre.

Treatment Number	Fertilizer Treatment	$/acre above basic fertilizer needs
1	Liquid Carbon @ ½ gallon/acre (preplant)	$18.00
2	2-15-15 @ 24 oz/a + Liquid Carbon @ ½ gal/a (applied in-furrow @ planting)	$28.12
3	8-16-8 @ 24 oz/a + Liquid Carbon @ 1 pt/a applied at tillering; + 2-15-15 @ 24 oz/a + Liquid Carbon @ 1 pt/a applied at booth stage	$29.24
4	Treatments 1, 2, & 3	$75.36
5	No addition fertilizer above base program[1]	-0-

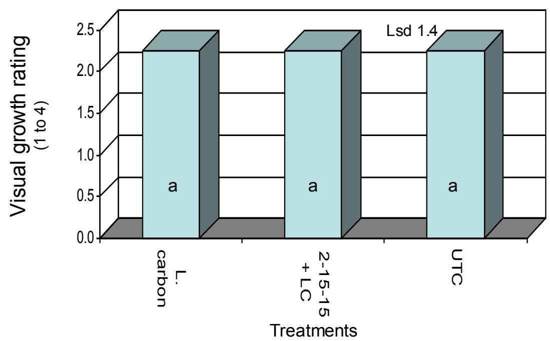
[1] Base program is 30 lb/a of N, 60 lb/a of K_20, and 20 lb/a of S at planting plus 125 lb/a of N at topdressing.

In 2011 the Monty's 8-16-8 foliar fertilizer and Monty's Liquid Carbon were applied alone and in combination on the Benson-Russ Farm. The treatments were applied on March 8. There was no significant impact on wheat yield from Monty's 8-16-8, Liquid Carbon, or 8-16-8 + Liquid Carbon (Graph FT1.).

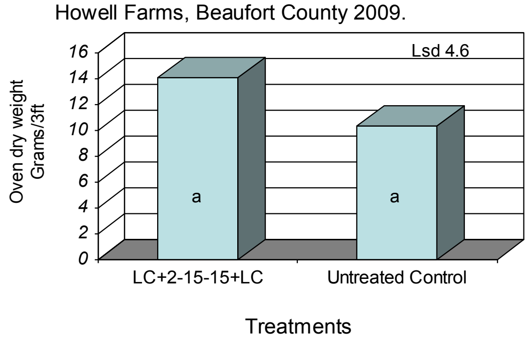
Graph FT1. Impact of Monty's Liquid Carbon and Monty's 8-16-8 specialty fertilizer on wheat yield, Benson-Russ Farm, Beaufort County 2011.



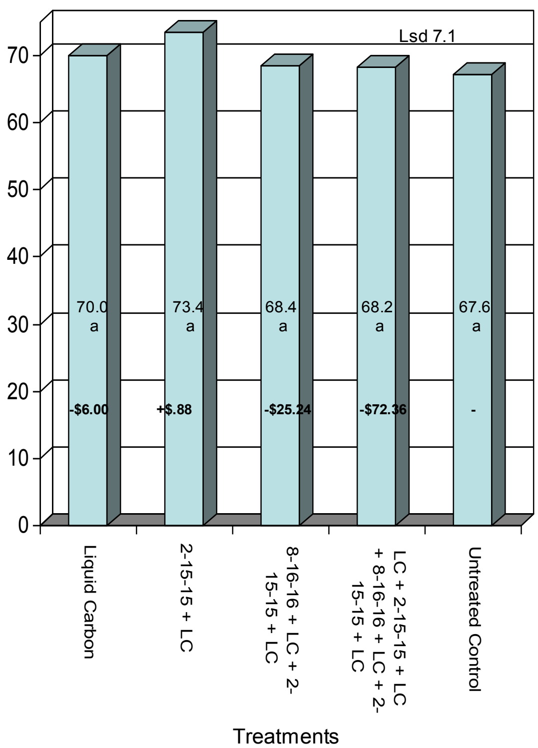
Graph FT2. Impact of Multicrop fertilizers on early season wheat growth (2-23-09), Howell Farms, Beaufort County 2009.



Graph FT3. Impact of Multicrop fertilizers on early season wheat growth (above ground oven dry weight) Howell Farms, Beaufort County 2009.



Graph FT4. Impact of Multicrop fertilizers on wheat yield and profit, Howell Farms, Beaufort County 2009.



Scab (Fusarium Head Blight) Control Trial

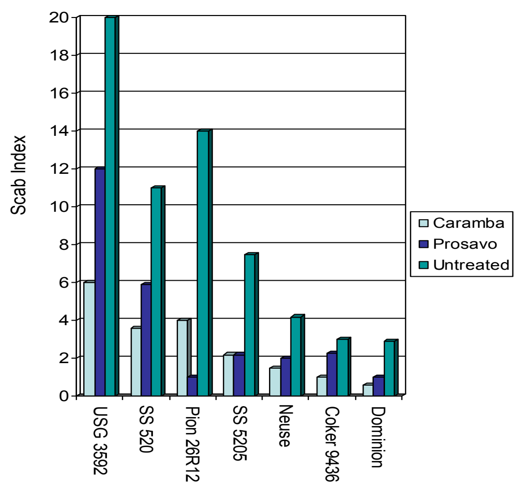
Head scab of small grain is caused by the fungus *Fusarium graminearum*, which also infects corn. Scab can occur in all small grains. Infection occurs at or soon after flowering, when fungal spores reach small-grain heads by wind or rain-splash. Once it's established in a spikelet, the fungus can spread along the rachis to other spikelets, resulting in heads that are partly green and partly bleached. Early infestations can cause kernel abortions, and later infections can cause shriveled kernels (tombstones) that have low test weight. Scab produces toxins in the harvested grain, the most common being DON. When DON reaches 2 parts per million (ppm) the grain is no longer fit for human consumption and cannot be sold to a flour mill. When DON reaches 5 ppm, the grain is no longer fit even for swine feed.

Control measures include tillage, crop rotation, resistant varieties, and fungicides.

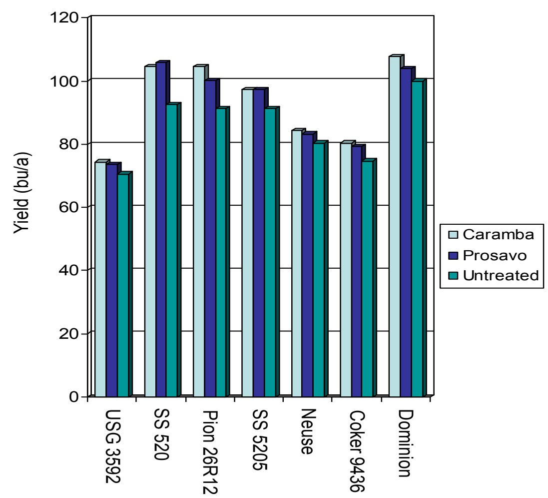
In 2011 a scab control on-farm-test was conducted on the Benson-Russ Farm in cooperation with Dr. Christina Cowger, USDA-ARS plant pathologist. Scab susceptible and scab resistant varieties were planted and foliar fungicides were applied at the beginning of flowering. Prior to flowering corn infected with the scab fungus was broadcast into the plot to increase the selection pressure from the disease.

The impact of variety resistance and fungicides is report in Graphs S1 and S2. The scab index is a measure of scab infestation. The higher the scab index number the more severe the scab infestation. Among the biggest tool to manage head scab is variety resistance (Graph S3). Timing application of the foliar fungicides Caramba and Prosavo can reduce the severity of head scab (Graph S4).

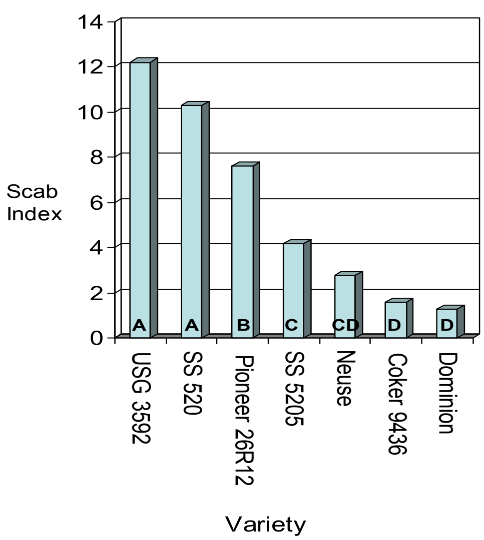
Graph S1. Impact of the fungicides Caramba and Prosavo on Head Scab severity on select wheat varieties, Benson-RussFarms, Beaufort County 2011.



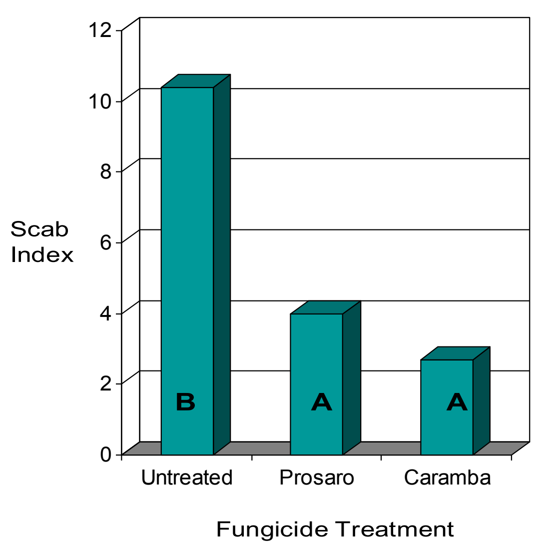
Graph S2. Impact of the fungicides Caramba and Parsavo on wheat yield among selected wheat varieties, Benson-Russ Farms, Beaufort County 2011.



Graph S3. Wheat Variety Influence on Head Scab Severity, Benson-Russ Farm, Beaufort County 2011.



Graph S4. Impact of Foliar Fungicides In Reducing the Severity of Head Scab, Benson-Russ Farm, Beaufort County 2011.

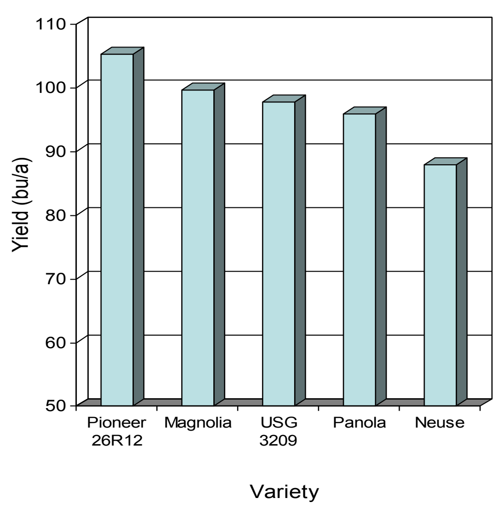


Random Pest Management Strategies

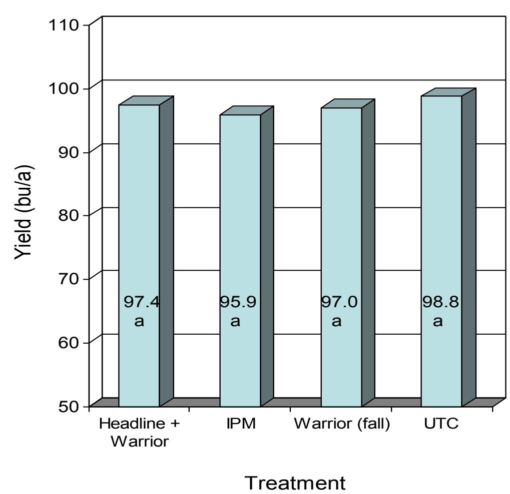
There are a wide range of pest management treatments that are promoted as insurance treatments. Often many of the recommendations are made in the absence of established disease and insect economic thresholds. In 2011, an on-farm-test was conducted to evaluate some pest management strategies. Five wheat varieties were planted that have demonstrated a wide range of disease and insect resistance. Pest management strategies included a fall Warrior application (17 DAP), Headline + Warrior treatment on March 4, an IPM treatment, and an untreated control. The IPM treatment used established thresholds for insect and diseases to apply a crop protection chemical. In 2011 the disease and insect thresholds were not reached for powdery mildew, leaf rust, or cereal leaf beetles and no insecticides or fungicides were applied.

There was not a significant increase in crop yield by the random application of insecticides or fungicides across all varieties (Graphs ST1 & ST2). The most profitable treatments were the IPM strategy and the untreated control.

Graph ST1. Impact of variety performance, Benson-Russ Farm, Beaufort County 2011.



Graph ST2. Impact of fungicide and insecticide treatments on wheat yield, Benson-Russ Farm, Beaufort County 2011.



Popup Fertilizer Trials

Four on-farm-tests have been conducted in the last three years evaluating the use of popup fertilizers (applying fertilizer in-furrow at planting). The 2009 and 2010 yield results are unclear. In general, there has been a boost of early season crop vigor and crop development with the use of the popup fertilizers (11-37-0 or 3-18-18 @ 5 gpa or 10 gpa). The crop yield from popup fertilizers in 2009 and 2010 was comparable with the broadcast fertilizers high in phosphorous, both broadcast and popup produced more yield than the untreated control.

In 2011 an on-farm-test was conducted on the Benson-Russ Farm using 5 gpa of 11-37-0, 5 gpa of 3-18-18, and an untreated control. All treatments received the same preplant fertilizer treatment and the same nitrogen topdress treatment. Both popup fertilizer treatments, 5 gpa of 11-37-0 or 5 gpa of 3-18-18, produced a significant increase in crop yield (Graph PP1).

Graph PP1. Impact of popup fertilizer on wheat yield, Benson-Russ Farm, Beaufort County 2011.