Union County Cooperative Extension

2011 Small Grains on Farm Test Report

Information Compiled By
Andrew Gardner

NC STATE UNIVERSITY

Union County Center
3230-D Presson Road
Monroe, NC 28112
Phone: 704.283.3742
Fax: 704.283.3734
http://www.union.ces.ncsu.edu/

To: Southern Piedmont Wheat Producers and Agribusiness Personnel

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The 2011 Small Grains on farm test report is finally complete. This year's wheat crop will be remembered for quite some time with above average yields on many acres in NC. In the following pages you will view results from the 2010-2011 small grains on farm testing program in Union County. This testing program was made possible thanks to the generosity of many individuals and organizations. The North Carolina Small Grain Growers Association has taken an active role in realizing the benefit of local on farm generated data. They stand beside their commitment for excellence in providing funding to support this effort. This research effort was expanded in 2010 to now include 4 centers in North Carolina, all in large production areas. I would like to sincerely thank the NC Small Grains Association for first allowing me the opportunity to conduct this research program and also for providing such a high level of support in friendship, instruction and funding.

I especially want to thank Medlin Farms for their donations. The donation of land, labor and equipment were, as always, above and beyond anything that I could have expected. This enormous donation made the 2011 Southern Piedmont Small Grains Field day possible and successful!

I would also like to extend a special note of gratitude to Perry Gardner. Planting the plots in itself isn't incredibly difficult but planting plots and changing varieties, drill settings, and treatments without making mistakes is impossible without good help. This year I had the benefit of outstanding assistance.

To Mr. Parks Helms, Steve Keziah, and Byron Purser, Thank you. These gentlemen offered their equipment and time and performed a critical role in installing one of the trials that sparked perhaps the greatest interest of all those contained in the following pages. Simply put, if they hadn't offered their equipment and time this trial would have been impossible.

In addition I would like to thank Mr. Chad Simpson and Cox Brothers Farms. Fortunately from a logistics standpoint I was able to conduct nearly all testing on the Medlin farm. However, not all trials can be conducted at one location. These operations allowed me to conduct trials on their farm and I want to say thank you to each operation.

Finally, I wish to express appreciation to Dr. Randy Weisz, Dr. Christina Cowger, Dr. Alan York, Mr. Barry Tarlton, Mr. Will Preddy and Mrs. Laura Gardner. Each of you played a pivotal role in the Union County Small Grains on farm testing program whether in plot planting, treatment application or harvest. Without your support and assistance it would not have been possible.

It is my sincere desire that the information provided in the following report will be beneficial to all small grains producers that view it. Thank you for your support of Union County Cooperative Extension.

Table of Contents

Illustrations

Early Planting of Late Varieties

Each year it becomes more and more obvious that the largest portion of our yield is made with fall tillers. It also seems to become more difficult to plant varieties on time as the fall is perhaps one of the busiest times in row crop production. Dr. Randy Weisz has conducted research over the past years to evaluate a new planting system to provide some answers to both of these issues. His system involves planting late maturing varieties very early, earlier than typical. Planting early provides the greatest opportunity for capitalizing on fall tiller production and also helps provide some relief to the "crunch time" effect of planting wheat while harvesting other crops. It has also become apparent that when using this method seeding rates must be reduced to avoid lodging. The increase in the number of patented wheat varieties has raised concern with seed cost. This planting method helps reduce a portion of this cost.

On October7, 2010 a trial was initiated to determine first would this system work in the Southern Piedmont. Secondly the trial was initiated to determine, provided the system worked, what seeding rates worked best and how did it compare to planting using a more traditional method.

Three late maturing varieties were selected for this trial and included: Dyna-Grow Shirley; Coker 9436; and Southern States 8302. Planting dates and rates are as follows: October 7: 12, 18 and 24 seeds/row foot; October 27: 18, 24 and 30; and November 19: 24, 30, and 36 seeds/row foot

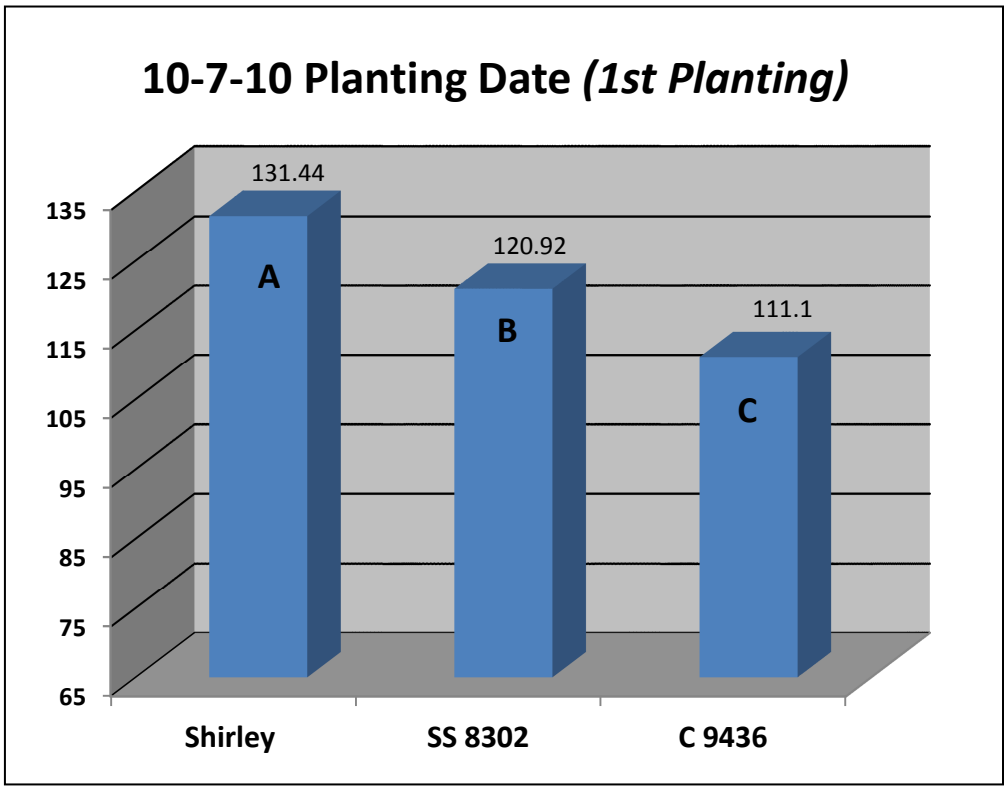

Figure 1. Yield comparisons of varieties for October 7, 2011 planting date

Seeding rate had no effect on yield when planting early and therefore is not shown. This being the case the lowest seeding rate yielded similar to the highest rate this year. The recommended seeding rate for early planting is 18 seeds per row foot. The unseasonably warm planting season is the most likely explanation for why the lowest seeding rate provided equivalent yield to the recommended rate. Research has indicated this trend isn't consistent and rates should be maintained near 18, which is lower than necessary when planting at more traditional times. It is important to note that the rates used in this trial are for 7.5 inch row spacings. Different widths would require different rates to maintain the same density per square foot.

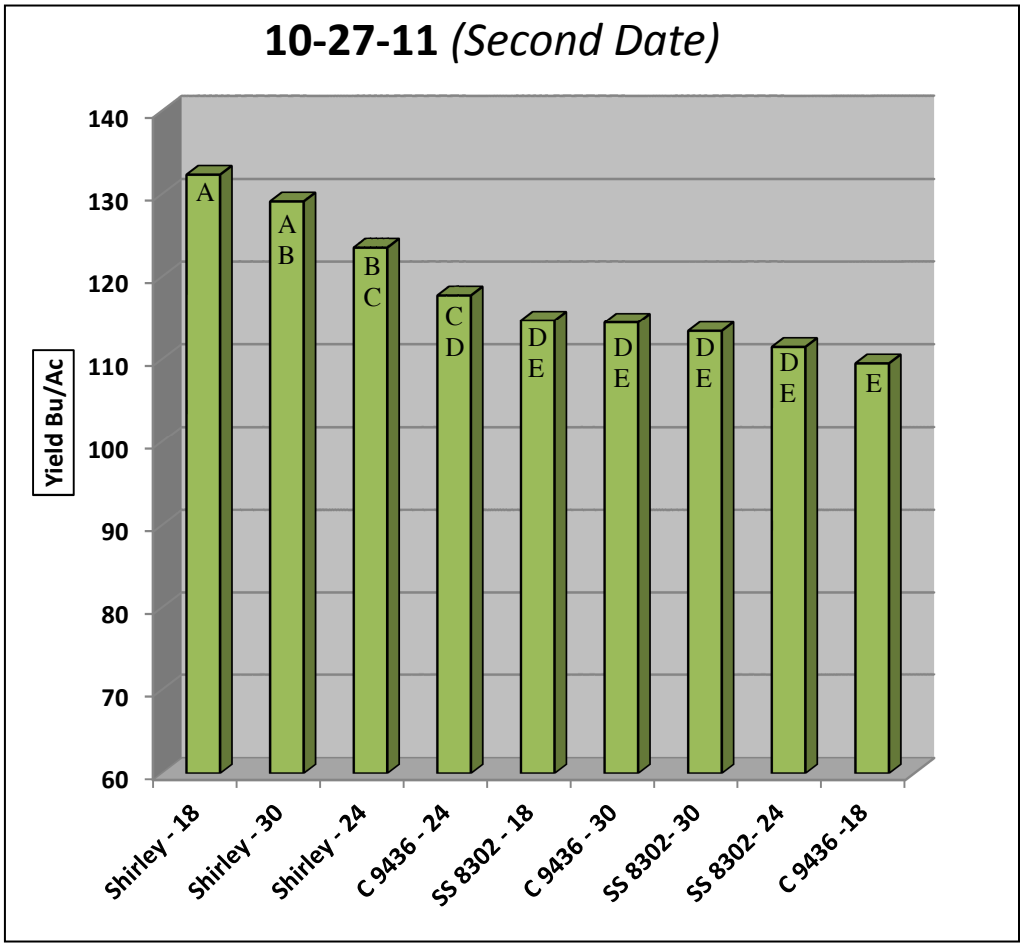

Figure 2. Yields by seeding rate as affected by variety for October 27, 2010 planting date

At the second or traditional planting rate varieties responded differently to seeding rate. The recommended seeding rate at this date would be 24 seeds/ row foot. Coker 9436 is the only variety that responded favorably to this rate in this particular trial. Shirley actually yielded the greatest at the lowest seeding rate. This can best be explained by lodging. Significant wind events occurred at heading and with the residual fertilizer from the previous corn crop widespread lodging occurred. No significant difference in yield was found with regardless of seeding rate for SS 8302.

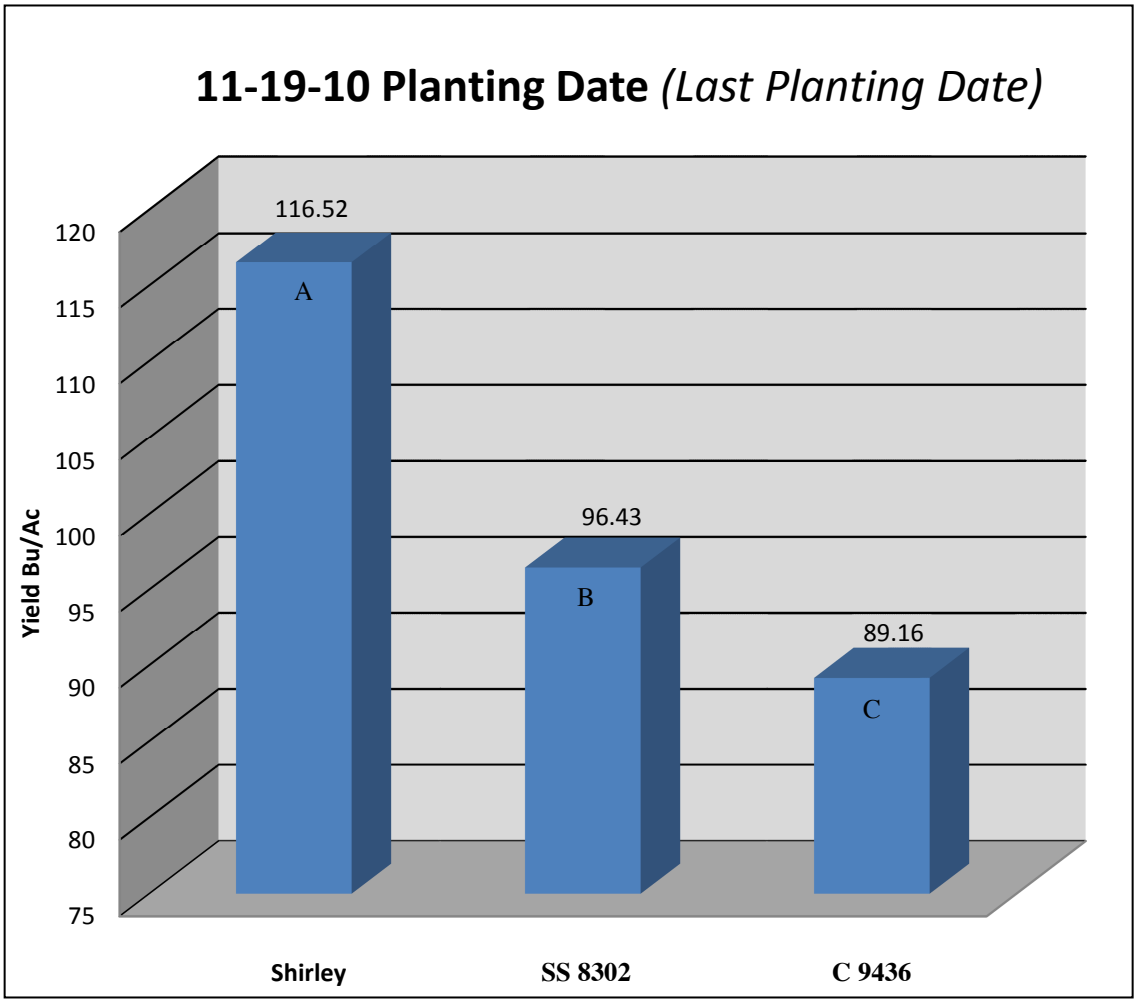

Figure 3. Yield comparisons of varieties for November 19, 2011 planting date

Once again at this particular seeding date yields were statistically similar at all seeding rates. However yields differed between varieties. The recommended seeding rate for this date would be 30 seeds per row foot with 7.5 inch spacing. Previous research has shown it is necessary to plant at this rate to maximize yields.

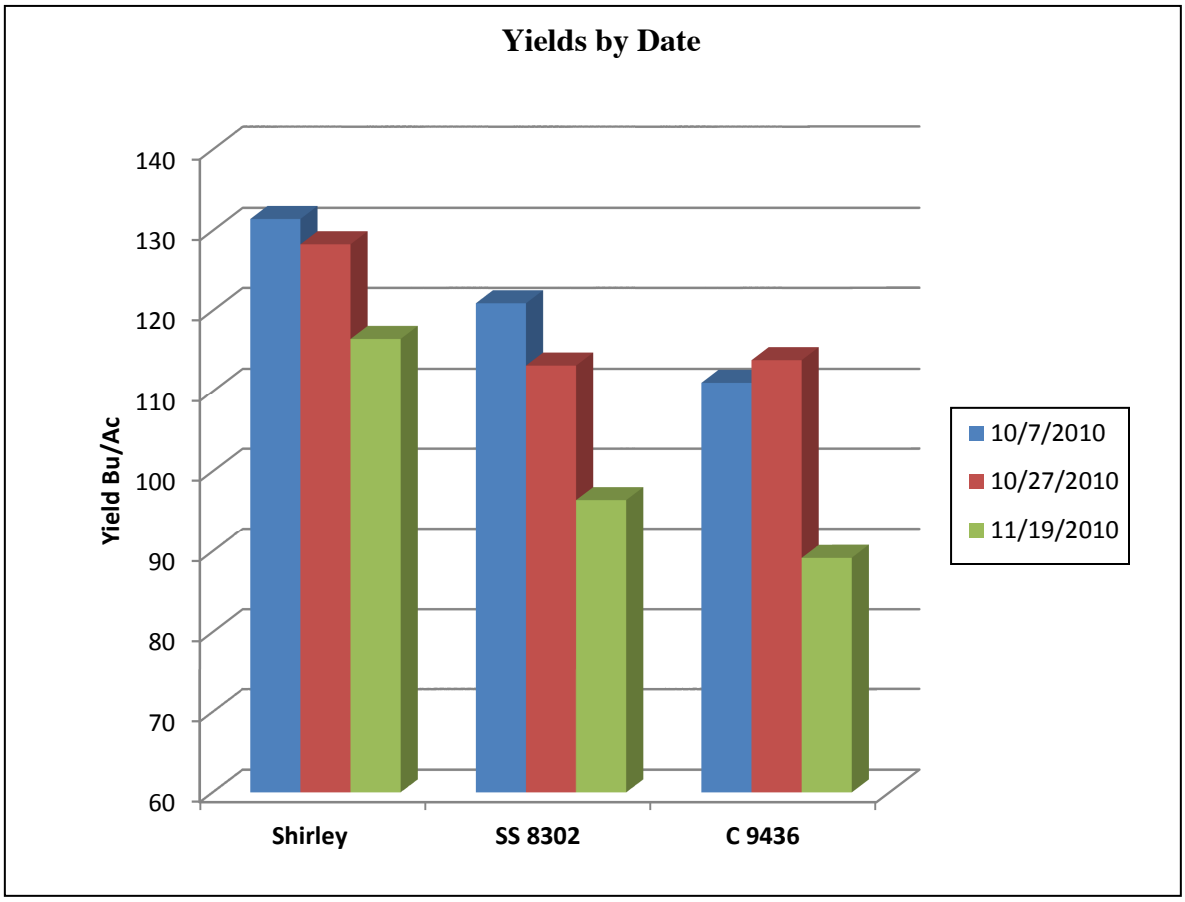

Figure 4. Yields averaged across planting rates for each planting date by variety.

The data from this trial clearly demonstrates the advantage of early planting late maturing varieties and certainly illustrates the yield loss from planting later than the recommended date. The data above is only numerical and wasn't subjected to statistical analysis but the decreasing yield trend is clearly evident. It is critical to note that these are all late maturing varieties. It is NEVER recommended to plant any other maturity group early as the risk of freeze damage is much too great. Also, when planting early insect pressure is something to be concerned with as populations are often high. Insecticide seed treatments are very strongly recommended when implementing this system.

Wheat Variety Trial

On October 29, 2010 30 varieties were planted in Monroe, NC in a randomized and replicated trial. Each variety was replicated 4 times. Plots were 7 foot by 29 foot. The trial was planted using a Great Plains No-Till drill into bush hogged corn residue. All varieties were planted at 22-24 seeds per row foot to ensure consistency**.** Dyna Grow Shirley, USG 3251 and Progeny P185 were the top yielders in this year's trial.

Variety												Yield	Test Wt.	Moisture %
DG Shirley	A											132.9	56.27	11.7
USG 3251	A	B										130.6	55.77	12.0
Progeny P185	A	B	C									123.9	57.35	11.6
SS 5205		B	C	D								122.3	57.22	11.9
P 26R12		B	C	D								121.7	56.59	11.5
NC Cape Fear			C	D	E							120.7	57.87	11.4
Oakes			C	D	E							120.4	58.40	13.4
USG 3201			C	D	E							119.9	57.82	12.1
Branson			C	D	E							119.8	56.15	11.2
USG 3120			C	D	E	F						118.9	58.50	11.8
W1566			C	D	E	F	G					118.6	55.48	1.3
SS 8641			C	D	E	F	G					118.2	57.25	12.3
NC Yadkin			C	D	E	F	G	H				116.7	56.12	11.5
USG 3555			C	D	E	F	G	H				116.7	56.05	12.2
USG 3409			C	D	E	F	G	H				116.6	56.29	12.2
P 25R32			C	D	E	F	G	H				116.3	56.18	11.6
VA Jamestown			C	D	E	F	G	H				115.8	58.61	11.9
P 26R15			C	D	E	F	G	H				115.7	55.46	10.5
SS 8302			C	D	E	F	G	H				115.5	57.09	11.8
USG 3209			C	D	E	F	G	H				114.6	56.12	11.9
C 9700				D	E	F	G	H				113.4	57.85	11.6
DG Dominion					E	F	G	H	I			111.3	56.88	11.4
USG 3665						F	G	H	I			109.7	56.09	11.5
SS 8308							G	H	I			109.3	57.19	11.3
C 9553							G	H	I			109.2	58.20	11.8
SY 9978								H	I	J		108.4	55.16	11.1
SS 8405								H	I	J		107.3	57.33	12.1
C 9804									I	J	K	103.7	55.30	11.8
NC Neuse										J	K	99.2	57.49	11.9
Arcadia											K	97.6	56.53	12.4

*Varieties with the same letter do not differ statistically in yield

Wheat Seed Treatments

Seed treatments are typically divided into two categories: insecticide and fungicide. The insecticide seed treatments are the more expensive seed treatment option and generally cost +/- $10/cwt. These treatments are very effective against early season insect pressure, most commonly in the form of aphids thus many times preventing Barley Yellow Dwarf Virus infections.

The fungicide treatments are the least expensive of the two, generally costing +/- $3 per hundred weight (cwt). These treatments are very effective against a broad spectrum of seedling problems such as seed borne diseases, seed rot and early season diseases.

On October 27, 2010 two trials were established to evaluate seed treatments. The first trial was conducted to evaluate insecticidal seed treatments only. Southern States 520 and Southern States 5205 were selected due to their similar maturity dates and differing susceptibility to Barley Yellow Dwarf Virus. Aphids are the most common wheat insect pest at planting in the Southern Piedmont. These aphids can be damaging in themselves but more importantly they often transmit the Barley Yellow Dwarf Virus which can lead to substantial yield losses. Treatments included Gaucho 600 @ 0.8oz/cwt, Cruiser 5FS @ 0.8oz/cwt, a 2 leaf application of Warrior II @ 1.9 oz/a and a nontreated check for each variety.

The second trial, planted also on October 27, 2010, was conducted to evaluate fungicidal seed treatments. Coker Panola and Coker Oakes were selected for this trial. These varieties were selected due to their disease susceptibility rating differences in the 2009 & 2010 NCSU Variety Performance ratings. Panola was rated as moderately resistant to powdery mildew, susceptible to leaf rust and SNB. Oakes was rated as moderately susceptible to powdery mildew and moderately resistant to leaf rust and SNB. Treatments included Raxil MD @5 oz/cwt; Dividend Extreme 2 oz/cwt; Proceed @ 1 oz/cwt and a nontreated check for each variety. This trial was conducted to evaluate the effects of seed treatments as effected by variety resistance.

Figure 5. Yields as affected by insecticide seed treatment and variety

Results for the insecticide seed treatment demonstrated once again the benefits of selecting varieties with resistance traits. No differences were found in any of the treatments with SS5205. This could be explained by the fact that it is rated as Moderately Resistant to Barley Yellow Dwarf Virus. No differences were found between SS 520 between any treatments, with the exception that all treatments yielded significantly better than the non-treated check.

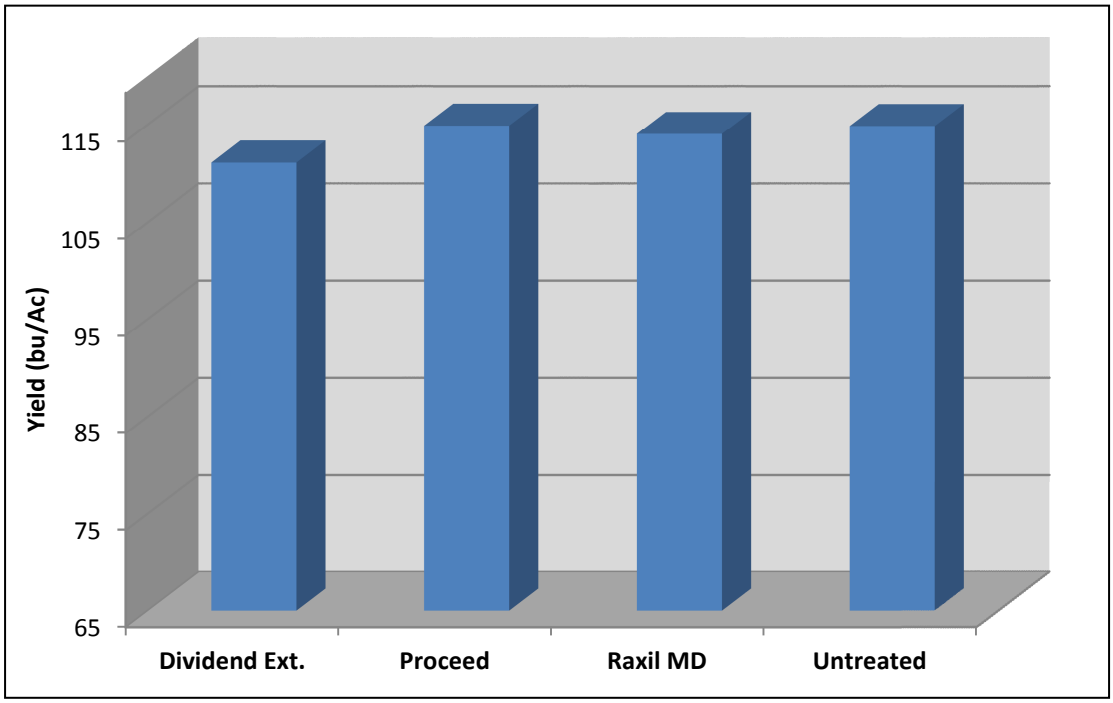

Figure 6. Yields as affected by fungicide seed treatment averaged over Panola and Oakes varieties

The results from the fungicide seed treatment trial were much less exciting as no significant differences were found between either variety or seed treatment. This could be explained in multiple ways but the most likely explanation is low disease pressure. This planting season the soil was rarely saturated. This often creates a scenario where disease pressure is low and in this instance seed treatments would be expected to make little to no difference. The other likely explanation was the use of high quality, disease free seed. If the disease isn't there you certainly wouldn't expect a treatment to control it.

Foliar Fungicide Trials

Foliar fungicides have always been excellent tools to control many foliar diseases. Recently they have gained popularity due to a potential increase in "plant health". Trials conducted in the 2008-2009 and 2009-2010 production season showed no advantage to applying a foliar fungicide in the absence of diseases. Many researchers have been recording substantial yield increases with the addition of a foliar fungicide regardless of disease pressure. Therefore on October 28, 2010 three varieties were planted at the Union County test site to evaluate foliar fungicides in the Southern Piedmont. NC Neuse was selected due to its high levels of disease resistance. It is rated at least moderately resistant to powdery mildew, leaf rust and SNB. These are the three most common wheat diseases in the Southern Piedmont and therefore were the focal points for this research. The next variety that was selected was Coker Magnolia. This variety was selected due to its susceptibilty to powdery mildew. The final variety that was included was USG 3409. This variety was selected due to its ranking of at least moderately susceptible to powdery mildew, leaf rust and SNB. The objective of this trial was to ideally obtain threshold levels of either powdery mildew, leaf rust or SNB and evaluate fungicide efficacy. If these pests were not present fungicides would still be sprayed to determine what impact a plant health application may have. Unfortunately the only disease that developed was a light infestation of powdery mildew on Magnolia. The fungus appeared at flag leaf and at sub-threshold levels. Applications were still made regardless of infestation levels at flag leaf.

Treatments included a non-treated check: Tilt @ 4 fl oz/ac; Caramba @ 14 fl oz/ac; Prosaro 421 @ 8 fl oz/ac; Quadris @ 10.8 fl oz/ac; Headline @ 9 fl oz/ac; and Quilt @ 14 fl oz/ac and Twinline @ 8 fl oz/ac. All treatments were applied on April 15, 2011 when wheat was at full flag leaf emergence, but prior to heading.

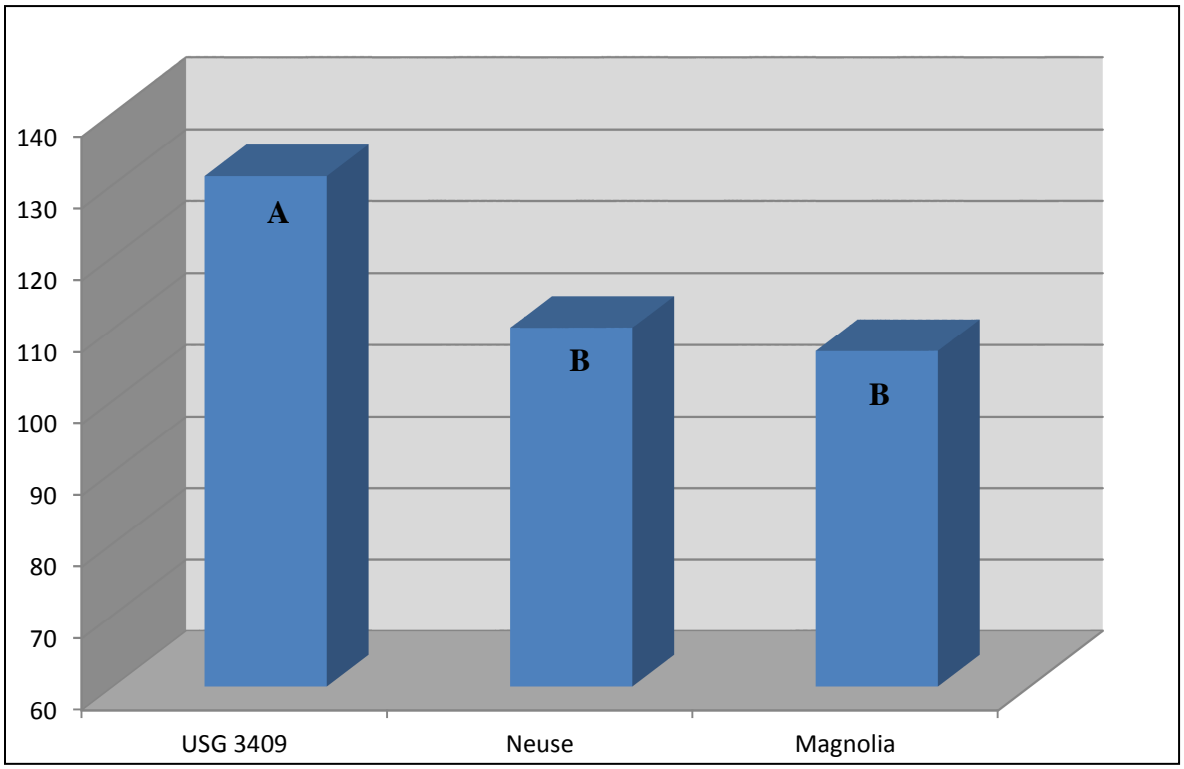

Figure 7. Yields averaged over fungicide treatment by variety

Upon evaluation of these trials many different transformations were evaluated. Individual treatments were evaluated as well as varieties. Results showed significant differences in average yields between varieties. This is represented in chart above.

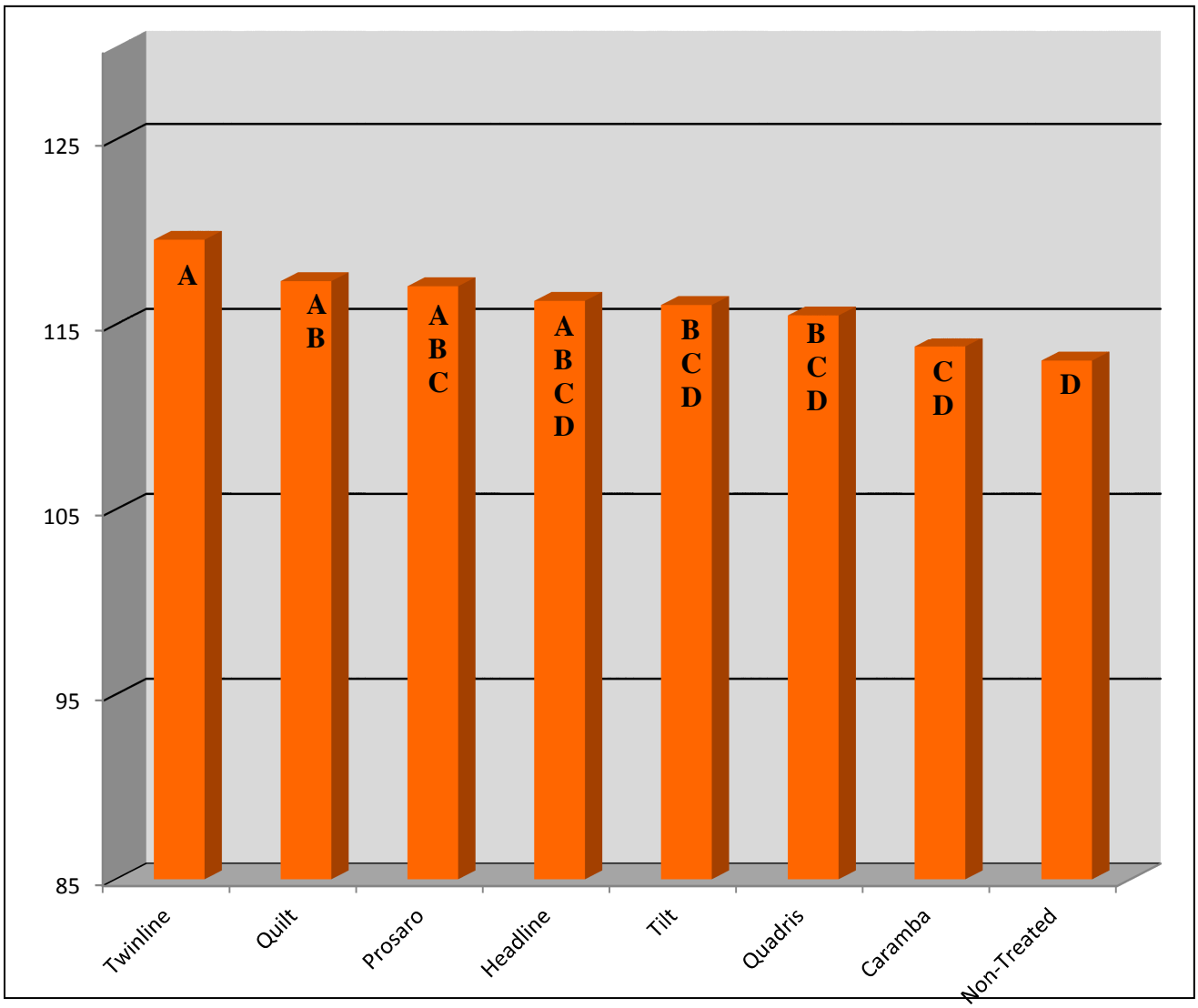

Figure 8. Yields as affected by fungicide averaged over NC Neuse, USG 3409 and Coker Magnolia

Further analysis showed fungicide response was the same across all varieties. Each variety responded favorably in a statistically identical manner. Statistical analysis revealed Twinline, Quilt, Prosaro and Headline were the best fungicides and all remaining fungicides created a similar response. It is important to note that these applications were all made to wheat with sub-threshold disease levels at the time of application.

Topdress Nitrogen Additives Evaluation

In 2010 a trial was initiated to evaluate the advantage or disadvantage of adding an insecticide or fungicide with topdress nitrogen. This approach has been conducted on ever increasing acreage over the past three wheat production seasons. The appeal of this treatment is that there in no additional application cost for either the fungicide or the insecticide since a fertilizer application is already being made. This trial has been conducted over the past 2008-2009 and 2009-2010 production seasons with no statistical difference. The 2010-2011 trial was the third year it has been conducted.

The varieties selected this year were Coker Oakes and Coker 9436. Oakes was selected for its moderate susceptibility to powdery mildew and Barley Yellow Dwarf Virus and its moderate resistance to leaf rust and SNB. 9436 was selected for its moderate resistance to powdery mildew and its moderate susceptibility to Leaf rust, and susceptibility to SNB and Barley Yellow Dwarf Virus. Treatments included 32% UAN alone as the nontreated check, 32% UAN alone to be treated if disease threshold was met, and 32% UAN alone to be treated if Cereal Leaf Beetle threshold was met. Treatments also included 32% UAN plus either: Tilt @ 4 oz/ac.; Quilt @ 14 oz/ac; Quadris @ 6 oz/ac; Quadris @ 10.8 oz/ac; Quadris @ 10.8 oz/ac plus Warrior II @ 1.9 oz/ac; or Warrior II @ 1.9 oz/ac. All applications were made at 20 gallons per acre. Threshold levels of disease or Cereal Leaf Beetle were never met, therefore those treatments served as additional checks.

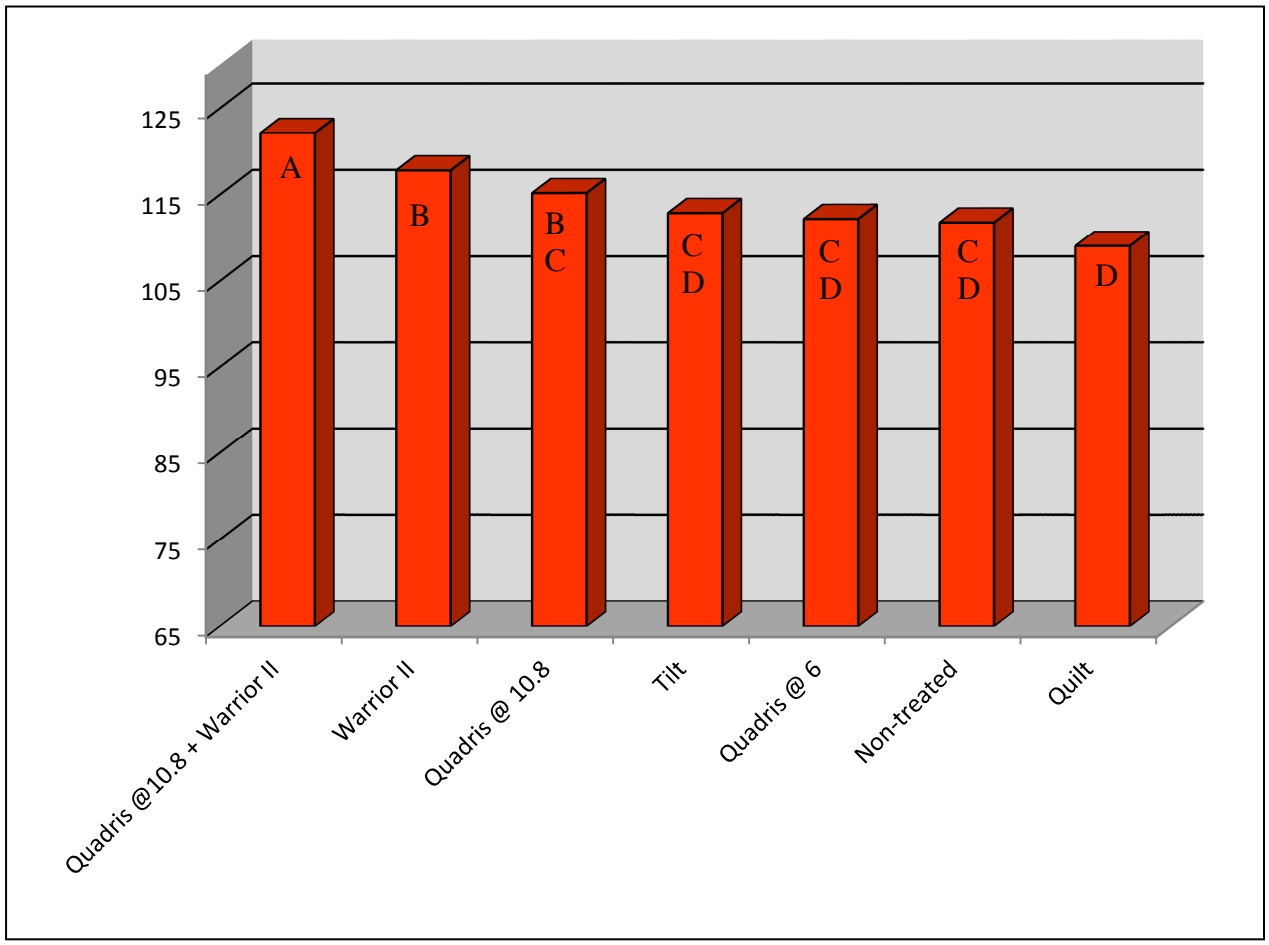

Figure 9. Yields of Coker Oakes by topdress treatment

The previous two years have shown no significant difference between any treatments. However this season significant differences were present. In the Coker Oakes trial yields in plots treated with Quadris at 10.8 ounces plus Warrior II were significantly greater than any other treatments. All treatments containing Warrior II yielded significantly greater than those treated with fungicide alone with the exception of Quadris at 10.8 ounces. All other fungicides yielded similarly to the nontreated check. The best explanation for why the pyrethroid treated plots yielded significantly better could be due to a minor infestation of hession fly. No hessian flies were spotted at this site but a light infestation is often difficult to observe.

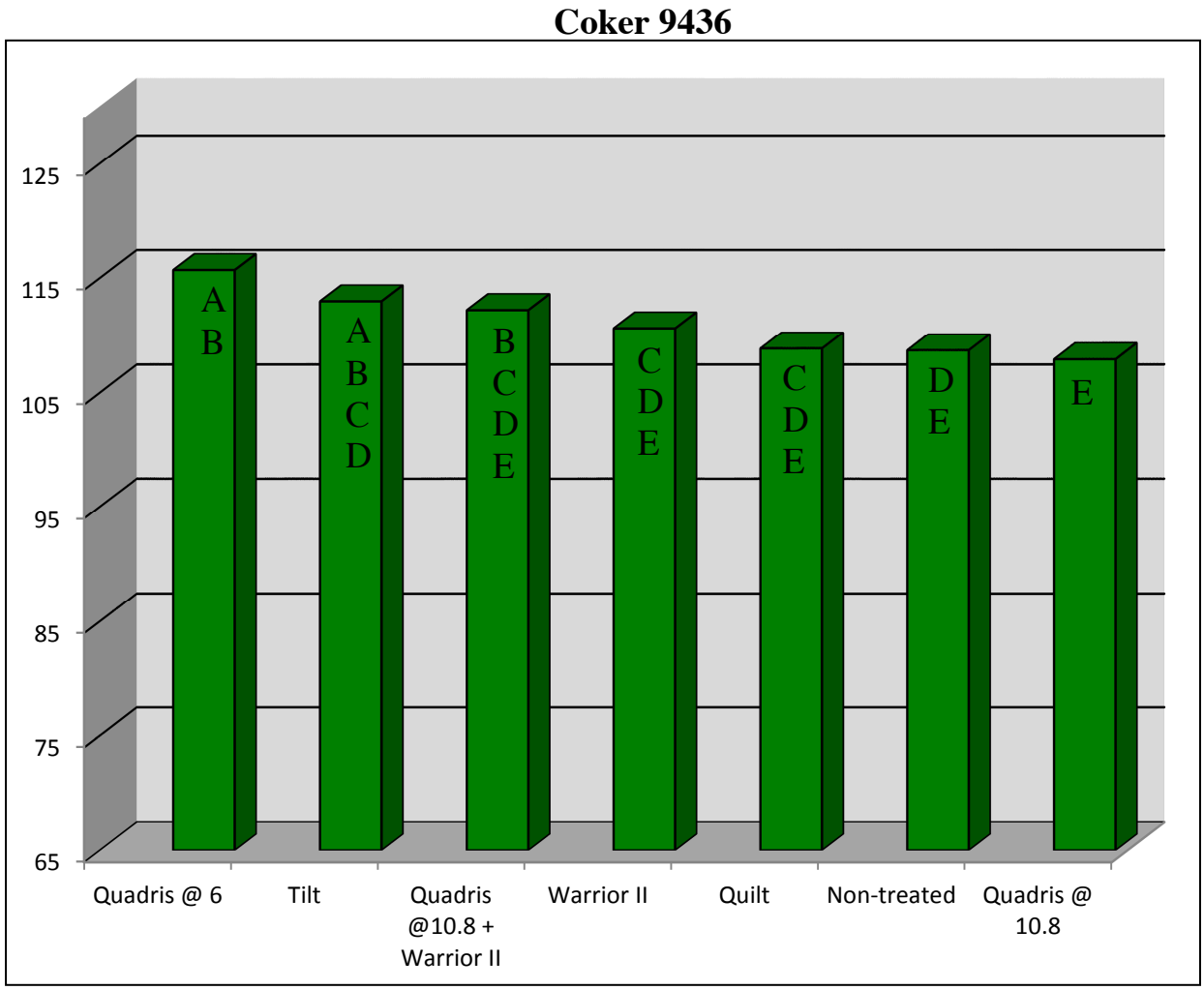

Figure 10. Yields of Coker 9436 by topdress treatment

The data from the trial containing Coker 9436 unfortunately is not as clean as that with Coker Oakes. There were no differences in yield in plots treated with Tilt, Quadris + Warrior, Warrior alone, Quilt or the non treated check. Also, Quadris at 6 oz yielded greater than Quadris at 10.8 ounces. The data from this trial is inconclusive. Lodging was a major issue in this trial due to its location in the field. This is the best explanation to variation in this trial and therefore should not be used to make decisions.

Planting Techniques

Interest in new planting methods for wheat has increased in recent years. The techniques that are of the most interest in the Southern Piedmont are the grain drill, broadast and incorporation and 15 inch planting. Drilling is the most popular method of planting wheat; but the broadcast and incorporation method is gaining interest each year. The biggest appeal with this approach is the speed at which it can be conducted. The new vertical tillage implements have made this technique very efficient and it is without a doubt the fastest way to get wheat sown. Finally, the majority of soybeans planted in the Southern Piedmont are planted on 15 inch row middles. A growing number of corn acres are planted using this narrow spacing. The appeal of planting wheat on 15 inch spacing is the elimination of a grain drill. This would allow producers to install their entire crop using one piece of planting equipment. A trial was conducted in the 2009-2011 production season comparing the 15 inch planted wheat to drilled wheat. In this trial drilled wheat was found to be 5 bushels greater than planted wheat.

This trial was initiated on October 28, 2010 using Pioneer 26R12. Treatments included drilled with a no-till drill, broadcast and incorporated with a vertical tillage implement, and finally planted using a 15 inch planter. All treatments were planted at 40 seeds per square foot. This is incredibly thick for wheat at this planting date. This rate was chosen as one of the implements used for this trial could not be adjusted conveniently to a lesser rate. Therefore in order to be fair to all techniques this rate was kept consistent.

In 2011 a more substantial difference was found between planting techniques. Drilled wheat yielded significantly similar to the broadcast and incorporated. The broadcast and incorporated yielded significantly similar to the planted. However a significant difference between planted and drilled techniques was found. The drilled wheat yielded 18.5 bushels greater than the planted wheat.

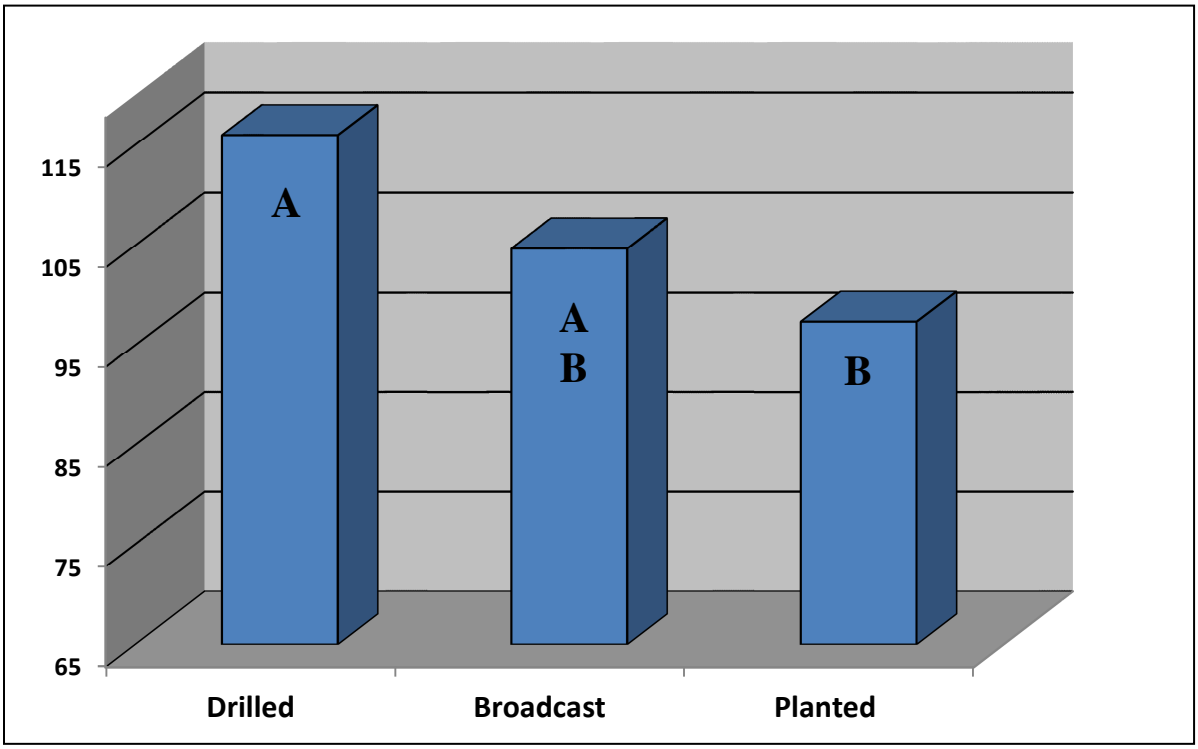

Figure 11. Yields of Pioneer 26R12 as affected by planting technique

Topdress Nozzle Evaluation

Many conversations are often conducted each spring concerning what type of nozzle should be used to apply liquid nitrogen to wheat at GS 30. It is the generally accepted opinion that the nozzle that produces the largest droplets should be used to reduce tissue burn. The question that arises is does the burn from smaller droplets affect the yield. On October 28, 2010 a trial was initiated with Coker Oakes to determine the answer to this question. The plots were topdressed using 28% UAN at 20 Gallons per acre on March 18, 2011 at GS 30. Treatments included Air Inducted, Turbo and Flat Fan nozzles and a nontreated check that received no topdress fertilizer.

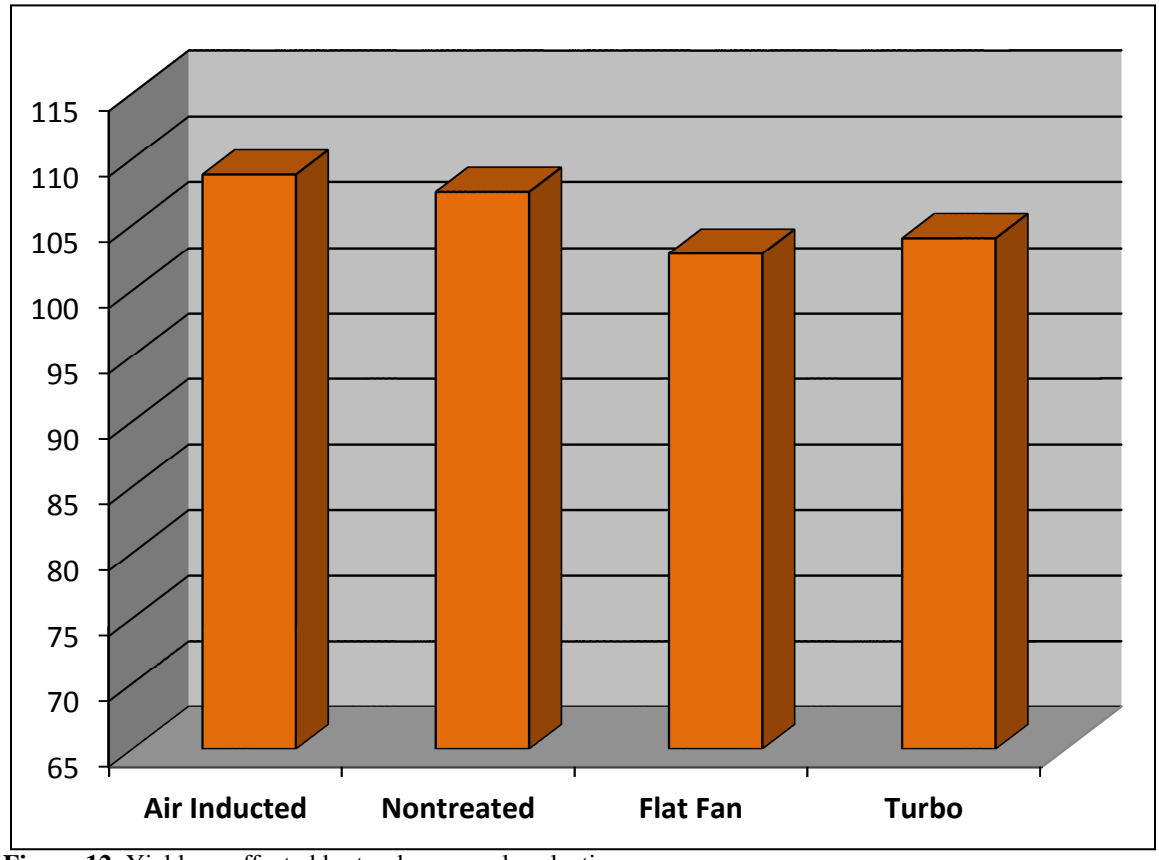

Figure 12. Yields as affected by topdress nozzle selection

This trial was taken to yield and no significant differences were found. There were substantial numerical differences but no significant differences. It is important to take note of the nontreated check. This plot received no topdress fertilizer. In this particular field enough residual fertilizer remained in the soil to produce the same yield as one with additional fertilizer. This particular trial tends to suggest the benefit or potential cost savings to tissue sampling.

Experimental Herbicide Evaluation for Italian Ryegrass Control

On November 9, 2010, a trial was initiated to evaluate the efficacy of a new experimental herbicide for Italian ryegrass control. Confidentiality agreements prevent the mention of the product name or its manufacturer therefore it will only be referred to as "Experimental X". Southern States 8302 was planted on October 29, 2010 in a field with a history of ryegrass pressure. Ryegrass populations were relatively dense; approximately 20 plants per square yard. Treatments include a non-treated, experimental compound X at rates 1, 2, and 3, Axial XL @ 16.4 oz/a; X at rate 2 plus Sharpen @ 2 oz/ac, X at rate 1 followed by Axial @ 16.4 oz, X at rate 2 plus Axial @ 16.4 oz; X at rate 3 plus Axial @ 16.4 oz; Axiom at 8 oz @ spiking, and Axiom at 8 oz @ spiking followed by Axial at 16.4 oz.

Multiple evaluations were made after application but in the interest of simplicity only 2 dates are shown. Postemergence applications were made on January 5, 2011 and control was evaluated at multiple times however only the February 3 and March 5 dates will be show for simplicity. Essentially all treatments that contained compound X regardless of rate or Axial at spike followed by a timely post provided similar and at least 85 % control season long. Axiom alone at spike stage provided the lowest level of control when compared to the nontreated check.

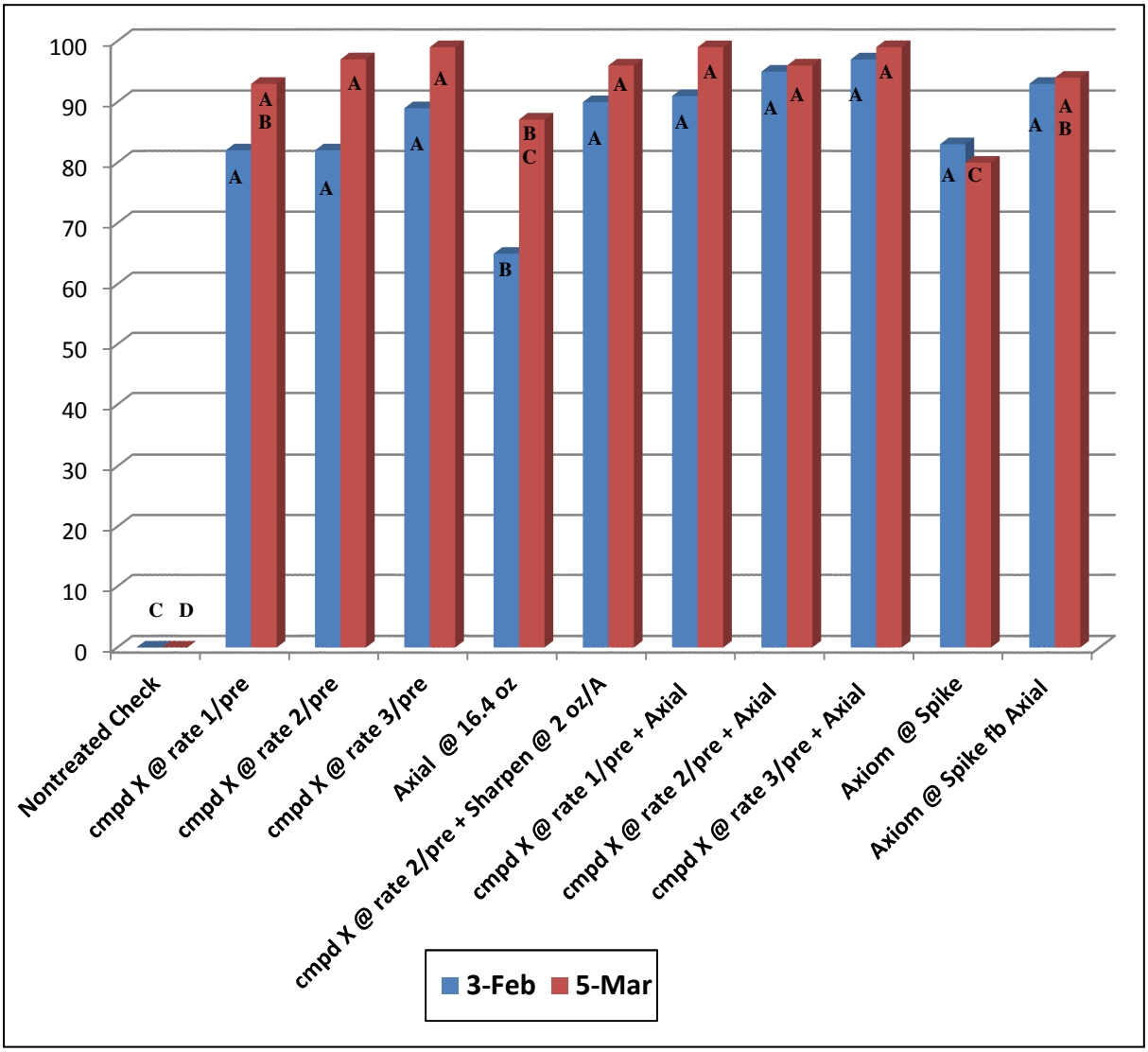

Figure 13. Percent Italian Ryegrass control when compared to the nontreated check