

2011 Results

# Brandt Research and Development Farm

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## Key Finds

- Four years of data show that Brandt Smart Trio can help reduce plant stress and improve yield when added to post applied herbicide applications. (pages 4 and 15)
- Total Acre management system maximizes the value of each crop input and helps you get the biggest bang for the buck! (page 6)
- We now have 6 years of data on fungicide applications on corn and beans. The results = 19.2 bu/ac on corn and 4.2 bu/ac on soybeans.

## Preface

Brandt is proud to present the 2011 results from our Research and Development Farm in Pleasant Plains. This was the seventh year for the farm and it has been a quick seven years! As usual we chose the hottest day of the year for our annual Agronomy Day on August 3. Hot as it was, there were some great presentations and information shared. This book is the result and culmination of the 2011 trials through harvest. Our goal is that you will find something of value for your operation.

Jean Payne, President of the Illinois Fertilizer and Chemical Association, joined us in August to discuss KIC2025. This program is a joint effort between industry, agriculture, state government and environmental groups to minimize the environmental impact of fall nutrient applications. Fall fertilizer and nitrogen applications are important to all of us! Let's help each other by following the KIC2025 guidelines. There are many yield enhancement opportunities within these pages. For example, much of the ag news today focuses on weed resistance and the use of alternative modes of action herbicides for good weed control. We have seen evidence of this practice with our customers in 2011. To this end, I draw your attention to the stress mitigation data for both corn and beans on pages 4 and 15. Several years of data show that the addition of Brandt Smart Trio® to these post herbicide combinations will limit plant stress and increase yield. These results are being seen throughout the corn belt. Smart Trio is manufactured in Pleasant Plains, Illinois!

We continue to build the database for the Brandt Total Acre® system. Check out these results. Brandt has the tools available now to assist you in maximizing all of your inputs in a total management system. We now have 6 years of data on fungicide performance in corn and beans. Across many variables of weather, planting dates, hybrids and varieties, corn averaged 19.2 bushels/acre and soybeans 4.2 bushels per acre yield increase over 6 years! Fungicides should be in every production plan.

Please review the data to draw your own conclusions. Ed Corrigan, Technical Agronomist and the primary architect of these trials, has provided a summary for your consideration. We value your feedback, questions and suggestions. For economic analysis and return/acre we have used the crop insurance October values for corn at \$6.32/bushel and soybeans at \$12.14/bushel.

Planning and executing the Brandt Research Farm is a major undertaking and requires work and dedication from our staff. In addition to the project manager, Ed Corrigan, we would like to thank and recognize the following Brandt employees: John Allen, Steve Clement, Glenn Fuchs, Carl Masters, Mark Powell, Julie Reynolds, Rich Sapp, Tommy Kimes, Emily Murray, Pat Schaddel, Barney Stock, Dave Wallner. Finally, several of our customers helped us with equipment, time and expertise. We could not have done it without you. Thanks.

**Tim McArdle**  
General Manager

# HYBRID RESPONSE TO CROP ROTATION AND POPULATION

**Cropping History:** 1st year corn on beans/8th year corn on corn  
**Tillage:** Conventional Tillage  
**Planting Date:** May 4, 2011  
**Harvest Date:** September 6, 2011  
**Herbicide:** 2 qt Degree XTRA at 2 leaf, with 20 gal 28% as a carrier  
**Post Herbicide:** 26 oz of Roundup WeatherMAX with 1 qt/ac Smart Trio  
**Population:** 33,000 / 36,000 / 39,000  
**Fungicide:** Headline 6 oz acre and 1qt/ac N Boron with 5 oz Hero at R2  
**Crop Nutrition:** 240-90-180 (30-90-180 fall applied suspension, 150 units of ammonia with N-Serve, 60 units of 28% at 2 leaf with Agrotain).



## Objective

Evaluate the yield response of each of the 11 hybrids to 3 populations and 2 crop rotations (1st year & 8th year corn.)

## Comments/Conclusions

There was only one population of corn on corn planted in 2011 due to the dimensions of the block. The corn following soybeans (1st year) was planted in a block long enough to allow for three populations of each hybrid.

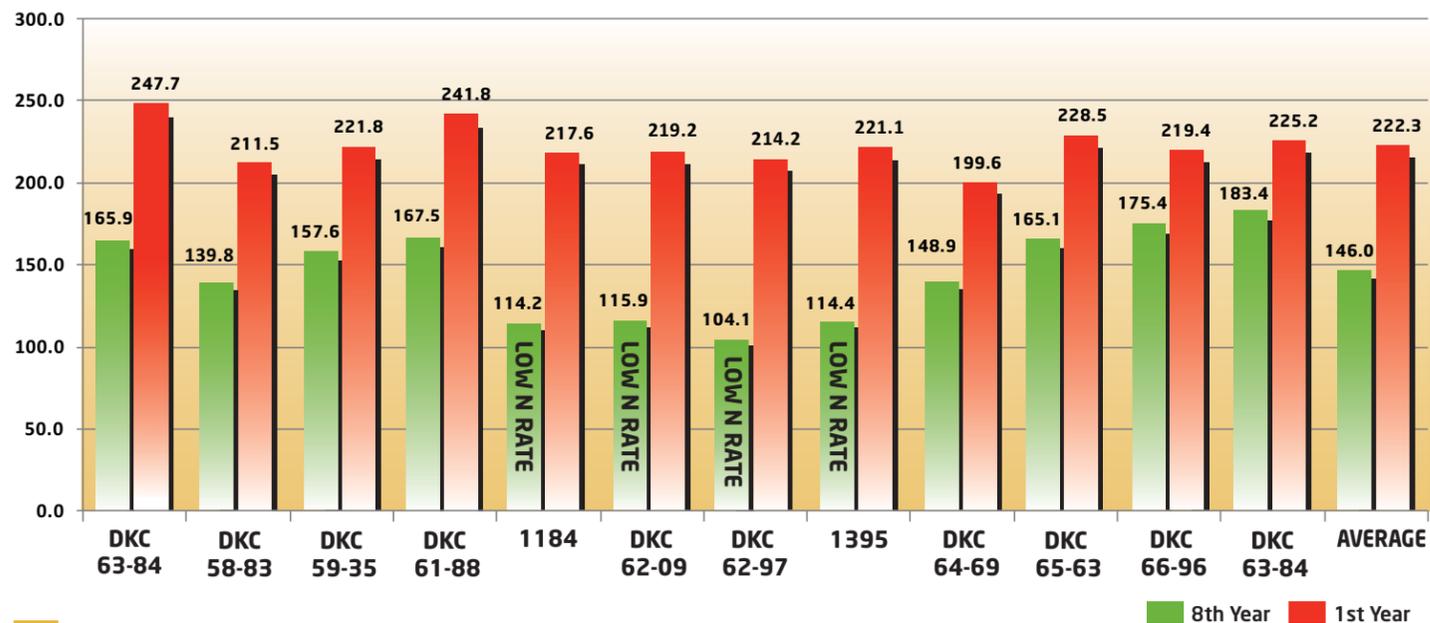
The corn on corn averaged 76 bushels per acre less and was 4.7% dryer than the 1st year corn. The lower moisture and yield per acre of the corn on corn was primarily due to the higher level of root and stalk diseases found in the continuous corn. Elevated levels of stalk disease reduced the nutrition movement into the corn

plant as it grew and tried to fill the ear. This lower nutrient content of the stalk pushed the plant into an accelerated maturity and premature death which led to the lower moisture and yields. To a lesser degree, root and stalk diseases were present in the 1st year corn which reduced the positive response to higher populations in many of the hybrids.

**Note:** A nitrogen application problem was identified in the center of the 8th yr corn trials. The center 4 hybrids (1184, 62-09, 62-97, 1395) did not receive the correct amount of nitrogen. Please take this into consideration when comparing these 4 hybrid trials.

## CORN HYBRID CROP ROTATION TRIALS

Population 36,000



The hybrid corn trials were planted in good soil conditions this spring which promoted a very even emergence. At the 2 leaf stage just 8 days after planting, the corn was a dark green color with a very healthy root system beginning to form on schedule (photo #1). The cold damp conditions that followed at the 3 leaf stage of growth included a cold snap that yellowed all the corn plants and in many of the fields turned the stressed corn plants to a pure white for a few days (photo #2). Corn plants that did not have a well developed root system during this cold and damp weather pattern were susceptible to root and crown diseases. Residue from the previous crop of corn provided a large source of inoculum which reduced corn on corn development and yield.



1

Plant tissue tests during the corn crop development at Pleasant Plains indicated "sufficient" levels of phosphorus and nitrogen (other than the 4 trials noted) with "deficient" levels of potassium, manganese, iron, boron, and zinc. This nutrient imbalance information will be incorporated into next year's fertility plan. We will be creating trials to try to stimulate plant nutrient uptake and improve nutrient balance, resulting in less disease and higher yields.

Through field observation it was noted that the incidence of Diplodia ear rot at the Pleasant Plains plots was reduced significantly by the addition of an insecticide to the fungicide application at the R2 stage of development. No longer can silk clipping be the only measure used for insecticide treatments during pollination. Insect feeding on the dying silks opens up the ear to disease spores and insect disease vectoring.



2

## HYBRID RESPONSE TO CROP ROTATION AND POPULATION

CROP ROTATION	VARIETY	TRAITS	MATURITY	HARVEST MOISTURE	YIELD AT 33,000	YIELD AT 36,000	YIELD AT 39,000	AVG. YIELD AT 15% MOISTURE	AVG. GROSS AT \$6.32 BU
1st yr Corn	DKC 63-84	VT3	113	21.6	248.6	247.7	224.3	240.2	\$1,407.25
8th yr Corn	DKC 63-84	VT3		18.6		165.9		165.9	\$1,004.88
1st yr Corn	DKC 58-83	VT3P	108	20.3	210.5	211.5	198.2	206.7	\$1,229.92
8th yr Corn	DKC 58-83	VT3P		15.4		139.8		139.8	\$879.63
1st yr Corn	DKC 59-35	VT3	109	20.8	226.9	221.8	216.7	221.8	\$1,311.59
8th yr Corn	DKC 59-35	VT3		16.0		157.6		157.6	\$984.7
1st yr Corn	DKC 61-88	VT3P	111	21.8	255.0	241.8	227.1	241.3	\$1,410.05
8th yr Corn	DKC 61-88	VT3P		16.4		167.5		167.5	\$1,042.49
1st yr Corn	P 1184XR	HXXLLRR2	111	23.8	233.5	217.6	225.7	225.6	\$1,286.80
8th yr Corn	P 1184XR	HXXLLRR2		17.7		114.2		114.2	\$700.26
1st yr Corn	DKC 62-09	VT3P	112	21.7	230.9	219.2	236.6	228.9	\$1,339.03
8th yr Corn	DKC 62-09	VT3P		15.8		115.9		115.9	\$725.98
1st yr Corn	DKC 62-97	VT3P	112	20.6	236.2	214.2	245.3	231.9	\$1,374.43
8th yr Corn	DKC 62-97	VT3P		14.6		104.1		104.1	\$658.21
1st yr Corn	P 1395XR	HXXLLRR2	113	25.1	225.0	221.1	226.4	224.2	\$1,258.32
8th yr Corn	P 1395XR	HXXLLRR2		17.1		114.4		114.4	\$706.33
1st yr Corn	DKC 64-69	VT3P	114	21.9	213.5	199.6	202.8	205.3	\$1,198.50
8th yr Corn	DKC 64-69	VT3P		17.8		148.9		148.9	\$911.81
1st yr Corn	DKC 65-63	VT3P	115	25.2	231.3	228.5	223.9	227.9	\$1,277.45
8th yr Corn	DKC 65-63	VT3P		17.8		165.1		165.1	\$1,010.79
1st yr Corn	DKC 66-96	VT3P	116	22.9	242.4	219.4	233.6	231.8	\$1,336.51
8th yr Corn	DKC 66-96	VT3P		22.8		175.4		175.4	\$1,013.05
1st yr Corn	DKC 63-84	VT3	113	23.2	240.6	225.2	244.0	236.6	\$1,359.23
8th yr Corn	DKC 63-84	VT3		22.4		183.4		183.4	\$1,064.10
1st yr Corn	Total Average			22.4	232.9	222.3	225.4	226.9	\$1,315.76
8th yr Corn	Total Average			17.7		146.0		146.0	\$891.85

# CORN HERBICIDE STRESS MITIGATION

**Cropping History:** 1st year Corn & 8th year Corn on Corn  
**Tillage:** Conventional Tillage  
**Planting Date:** April 10, 2011  
**Harvest Date:** September 3, 2011  
**Herbicide:** 2 qts Degree Xtra at 2 leaf, with 20 gal 28% as a carrier  
**Post Herbicide:** 26 oz of Roundup WeatherMAX with 1 qt/ac Smart Trio  
**Population:** 38,000  
**Fungicide:** Headline 6 oz acre at R2 with 1 qt/ac N Boron  
**Crop Nutrition:** 240-90-180 (30-90-180 fall applied suspension, 150 units of ammonia with N-Serve, 60 units of 28% at 2 leaf with Agrotain).



## Objective

Stress mitigation trials are designed to measure the yield improvement from eliminating or reducing unwanted crop stresses such as weather, nutrient imbalance, insect damage, or disease. Brandt Smart Trio is the first micronutrient combination designed to remove crop stress and stimulate growth without reducing the effectiveness of added crop protection products.

## Comments/Conclusion

The blocks designated for the corn stress mitigation trials in 2011 were planted on a Sunday afternoon, April 10, into a very mellow seedbed. A refuge hybrid (DKC 61-72) was chosen for both rotation environments and planted at 38,000 plants per acre. The soil

insecticide was Capture LFR applied in furrow at 5 oz per acre. The corn emerged very evenly 10 days after planting with good color. Throughout the spring, no rootworm damage or feeding was found on either of the trials, and the 8th yr corn continued to look as good as or better than the 1st yr corn.

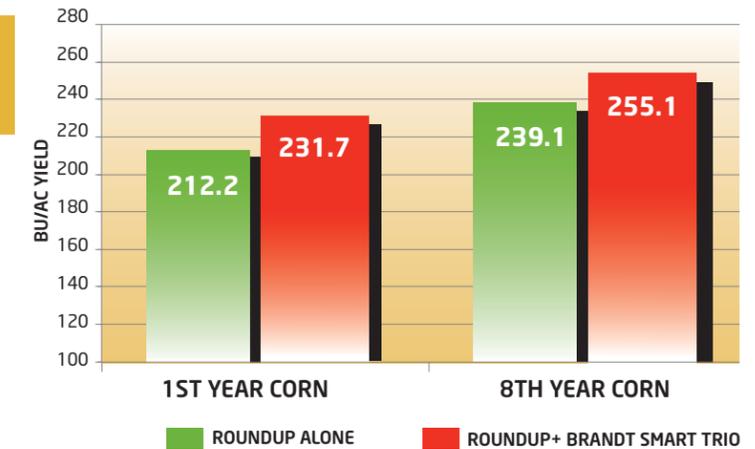
Stress mitigation trials were post applied on May 28 at V5 stage corn in 8 row trials. Visually that day, the corn looked in good health and did not display any nutrient deficiencies. Plant tissue tests pointed at sufficient levels of nitrogen, phosphorus and iron, with some deficient levels of potassium, manganese, zinc, and boron at the time of application. Roundup WeatherMAX was applied at 26 oz per acre as a base herbicide treatment for all post weed control trials. The addition of 1 quart per acre Smart Trio to mitigate the plant stress and stimulate growth was compared to WeatherMAX alone.

A 19.5 bu. per acre yield response was recorded in the 1 year corn and a 16 bu. per acre yield response in 8th yr corn (Graph 1).

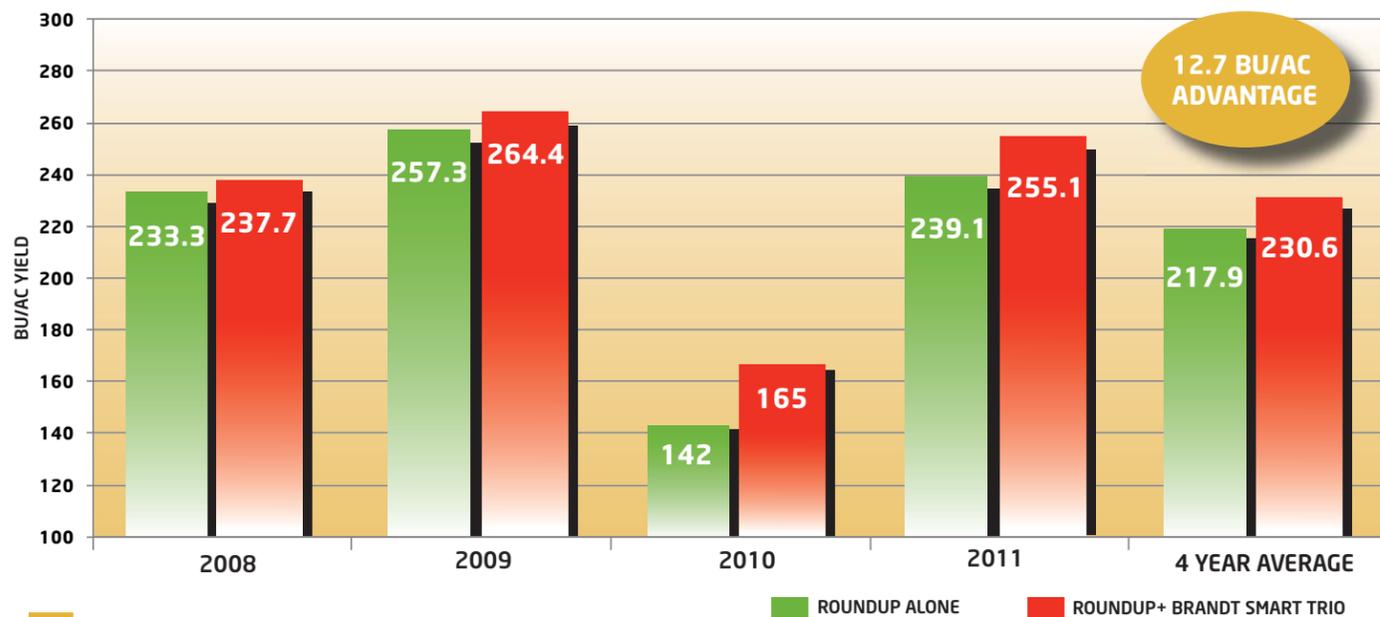
A 4 year average of 12.7 bu/ac yield advantage has been recorded at Pleasant Plains when Smart Trio was added to the post treatments (Graph 2).

Fungicides were also included as a stress mitigation treatment at the V5 stage Roundup application. The results of the fungicide trials (Graph 3) continue to be very inconsistent with some of the treatments recording a very positive yield response of up to 18 bu/ac and other trials with no yield response in side by side trials. This inconsistent performance of fungicides at the V5 stage of application over the last couple of years of trials has not given Brandt the confidence to recommend this practice on all situations. We will continue to evaluate in future trials.

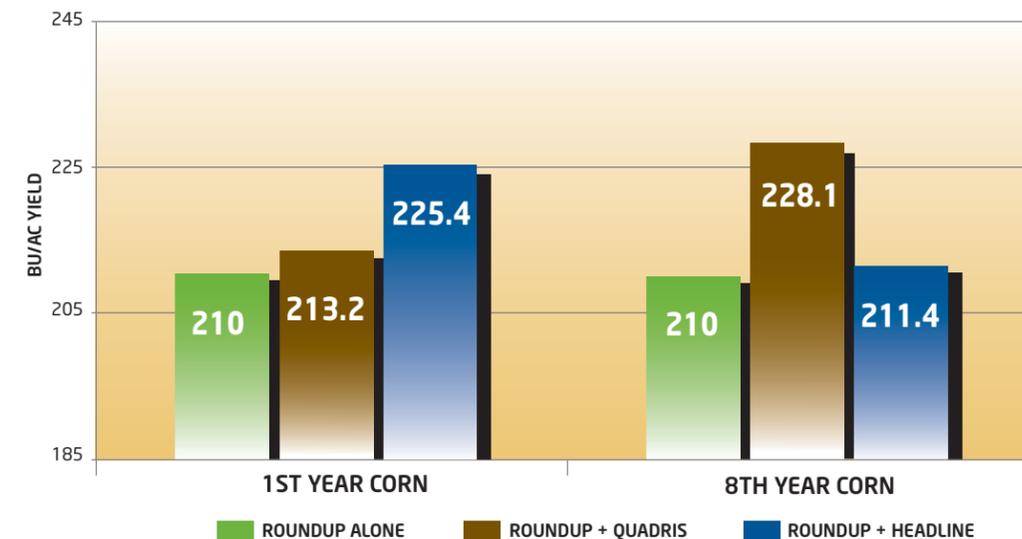
## 1) BRANDT SMART TRIO



## 2) CORN ON CORN STRESS MITIGATION (2008-2011 DATA)



## 3) FUNGICIDE TRIALS AT V5 STAGE



## BRANDT TOTAL ACRE RESULTS

**Cropping History:** 6th and 8th year Corn on Corn  
**Tillage:** Conventional Tillage  
**Planting Date:** April 14, 2011  
**Harvest Date:** September 3, 2011  
**Herbicide:** 2 qt Degree XTRA at 2 leaf, with 20 gal 28% as a carrier  
**Post Herbicide:** 26 oz of Roundup WeatherMAX with 1qt/ac Smart Trio  
**Population:** 33,000 / 36,000 / 39,000  
**Fungicide:** Headline 6 oz acre at R2 with 1qt/ac N Boron  
**Nutrition:** Various rates applied in the fall as suspension



### TOTAL ACRE POLE POSITIONS

1	Hybrid Variance	56.2 bu/ac
2	Potash Rate	27.4 bu/ac
3	Nitrogen Rate	18.3 bu/ac
4	Population Rate	13.9 bu/ac
5	Zinc (1qt/ac)	10.9 bu/ac
6	N Serve Response	4.8 bu/ac
7	Starter (4 gal/ac 28%)	4.5 bu/ac

### Objective

To evaluate the yield response to 6 management practices (Hybrid Phenotype, N Rate, P&K rate, Planting Population, 28% Starter, zinc at planting.

### Comments/Conclusions

Total Acre trial plots were soil finished on April 8th and planted on April 14 into a very mellow, warm soil. The next morning on the 15th, the weather changed to a cold rain and remained damp and cool through May 30. Even with these conditions, the corn did emerge evenly on the 29th. After enduring a very cool May, the corn had additional plant stresses from heavy rains in June. This was followed by a very dry July and August.

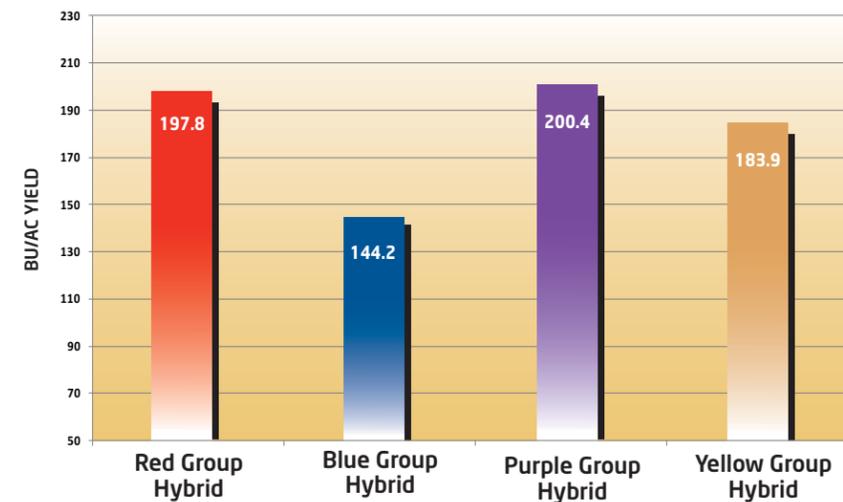
Total Acre is focused on measuring the yield impact of various management practices with each hybrid phenotype group (physical characteristics). Currently, Brandt is gathering management practice responses for five phenotype groups. Total Acre dem-

onstrates yield and efficiency of each management practice by hybrid group.

The trial design begins by incorporating all management practices that optimize yield and plant health. Next, each of the practices chosen for yield response (one at a time) is then removed or the rate is adjusted. This allows us to measure the degree of yield loss from the omission or reduction of a management practice. With this plot structure in mind, the value of each practice can be ranked by yield, and/or return on investment (ROI). The chart above is a ranking "by yield" of the practices measured in Total Acre in 2011, encompassing 208 trials.

*The graphs on pages 7, 8 and 9 focus on each of these Total Acre practices.*

### 1) TOTAL ACRE HYBRID VARIANCE

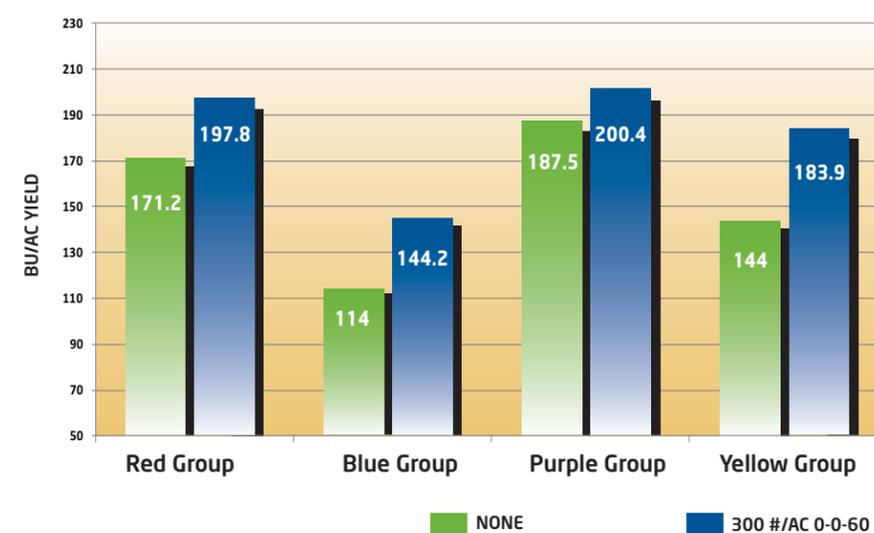


### Hybrid Variance Graph

A hybrid's ability to deal with the environment it is placed in continues to be one of the most important decisions for top yields each year. The chart to the left (1) is an indication of how each hybrid phenotype group varied in yield. Using the fall 2011 crop insurance grain price of \$6.32 per bushel, this decision had a value of up to \$335.18 per acre.

Each of the hybrid phenotype groups were designed with physical characteristics that allow it to perform best when confronted with a specific plant stress. The following graphs give us an insight as to how we may change our management practices to get the most out of each of the groups.

### 2) TOTAL ACRE POTASH RESPONSES



### Potash Response Graph

Yield response to the rate of potash applied was the 2nd most important decision for yield and averaged \$173 per acre. The rate of potash applied was also reported at harvest by the combine operator as one of the most visual distinctions noted from trial to trial. The higher potash rates were associated with reduced stalk disease and improved standability.

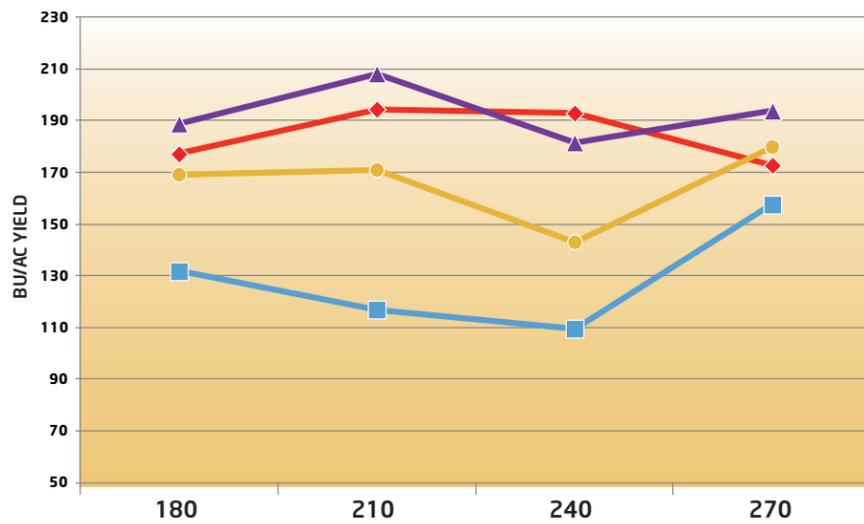
Potassium rate also influenced the nitrogen efficiency of each of the hybrid groups and was singled out as one of the most important practices as populations are increased. When populations increased to 39,000 plants per acre, the yield response to potassium reached 55 bushels per acre.

**Note:** Soil test levels of K in the trials are well over 400 lbs per acre.

# BRANDT TOTAL ACRE RESULTS



## 3) TOTAL ACRE NITROGEN RESPONSES

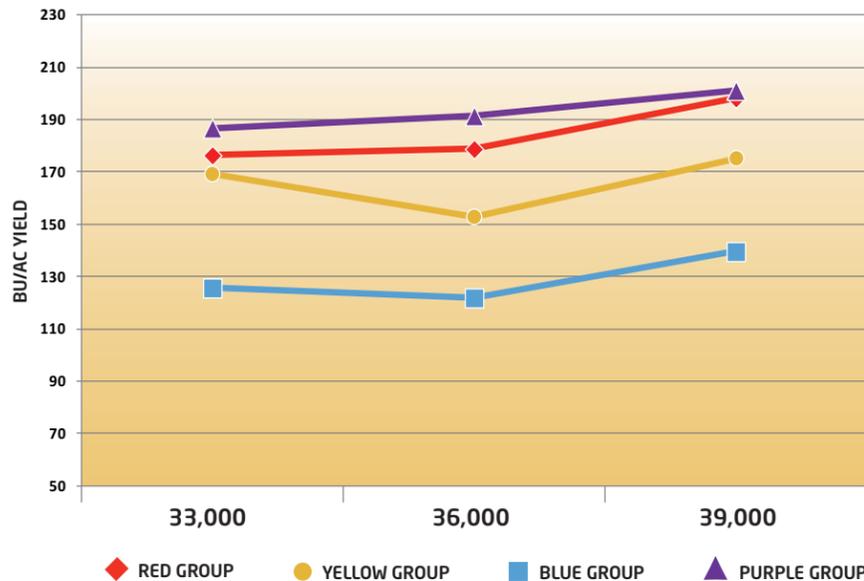


## Nitrogen Response Graph

Nitrogen yield response averaged a value of \$115 per acre and ranked 3rd in average yield improvement. The highest average yielding rate of N was 210 units per acre. As you can see from the graph, each of the hybrid groups responded a little differently to the rate of N applied. Yield response to nitrogen rate was also influenced by the rate of phosphorus and potash applied. When higher rates of P and K were applied, response to higher N rates was minimized. Nitrogen was less of a factor as population was reduced in the majority of the trials as well.

Tissue tests throughout the growing season indicated good levels of N in the plant.

## 4) TOTAL ACRE POPULATION RESPONSES

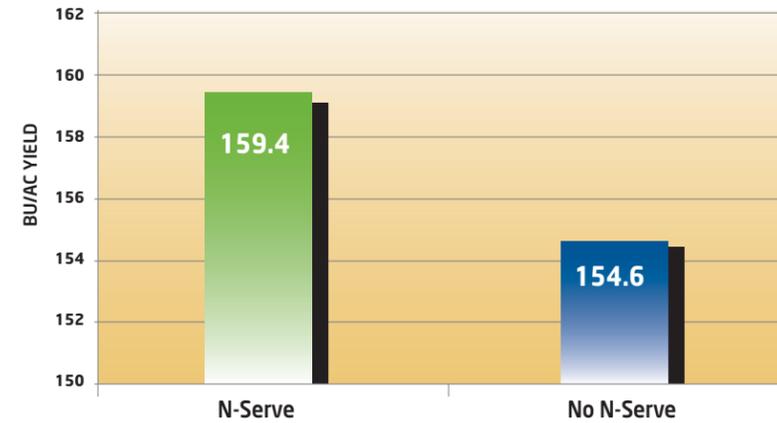


## Population Response Graph

The average population response to all trials was 13.9 bu per acre and this added a value of \$87.84 per acre by increasing the population to 39,000 plants per acre. Increasing the population was one of the most consistent practices for all hybrid groups for the 2011 Total Acre trials. The higher yield responses to population increase correlated to the higher rates of potash. This also improved the overall plant structure as well as yield. In most cases, the high populations did not correlate with the highest rates of nitrogen applied.

## 5) TOTAL ACRE N-SERVE® RESPONSES

2011 Pleasant Plains 6th yr Corn on Corn

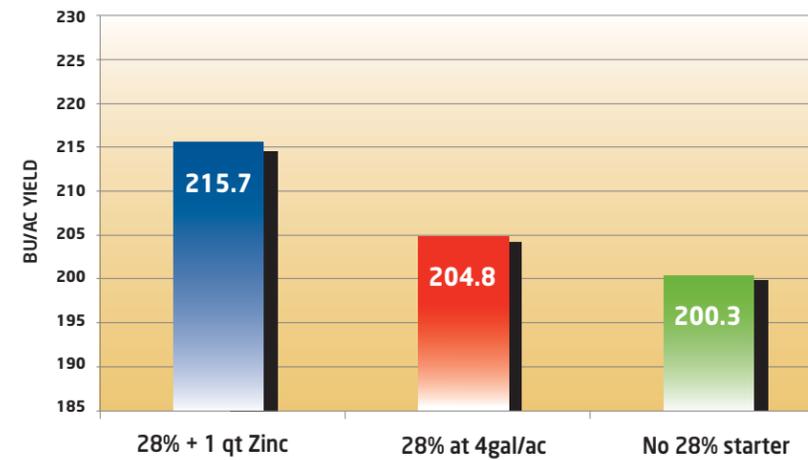


## N-Serve Response Graph

The N-Serve response had a gross value of \$30 per acre. This was an average of 16 trials that varied in drainage from good to poor. Nitrogen management continues to be very important for top yields as well as reducing environmental impact in streams and rivers. N-Serve has consistently proven itself to be of value for minimizing the loss of ammonia during wet spring conditions as soils warm up soils warm up.

## 6) TOTAL ACRE STARTER RESPONSES

Corn on corn 2011 Pleasant Plains Research Farm

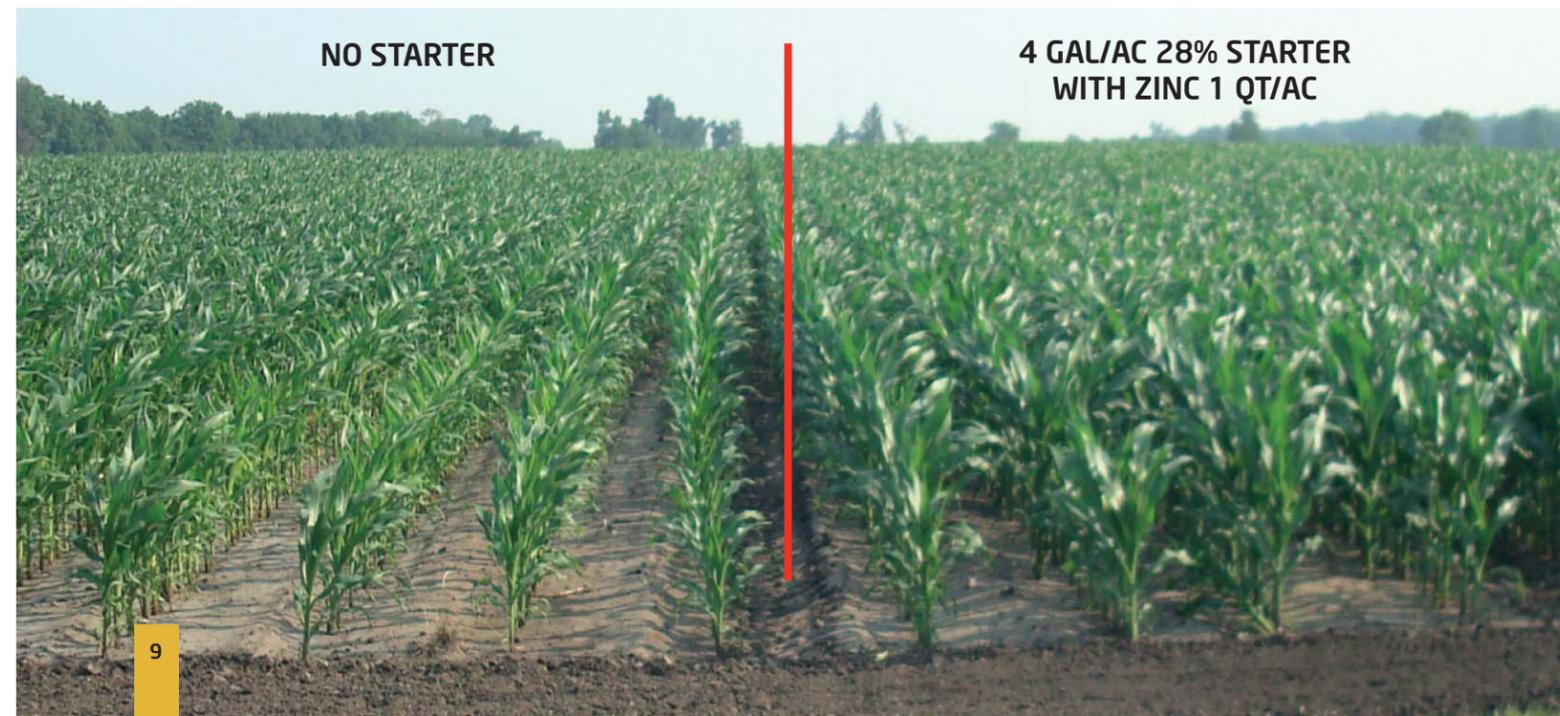


## Starter Response Graph

As you can see from the photo below, the response to a small amount of nitrogen and the addition of zinc paid off BIG this spring. The nitrogen provided just enough nutrition to improve plant functions during the cool temperatures. However, the real value was the zinc. It assisted the plant with disease prevention and stimulated rooting during the cool damp spring. The gross profit to adding zinc was \$68 per acre and had the best return on investment of 13.9 to 1. Wow!

Nitrogen timing and placement for corn on corn is more influential than corn following soybeans in most cases. Total Acre trials for 2012 will include comparing split application of N and placement of N trials to the current matrix.

## STARTER RESPONSE



## 20 INCH vs 30 INCH ROW WIDTH TRIALS

**Cropping History:** 1st Year Corn and 6th Year Corn  
**Tillage:** Conventional Tillage  
**Planting Date:** May 4 & 5, 2011  
**Harvest Date:** September 6, 2011  
**Herbicide:** 2 qts Degree Xtra at 2 leaf, with 20 gal 28% as a carrier  
**Post Herbicide:** 26 oz of Roundup WeatherMAX with 1 qt/ac Smart Trio  
**Population:** 33,000 / 36,000 / 39,000 / 42,000 / 45,000 / 48,000  
**Fungicide:** Headline 6 oz acre at R2 with 1 qt/ac N Boron  
**Crop Nutrition:** 240-90-180 (30-90-180 fall applied suspension, 150 units of ammonia with N-Serve, 60 units of 28% at 2 leaf with Agrotain).

### Objective

Evaluate corn production using the 20 inch row width to the current standard of 30 inch row width. The trials are focused on row width response to population, N rate, crop rotation, fungicide, and hybrid.

### Comments/Conclusions

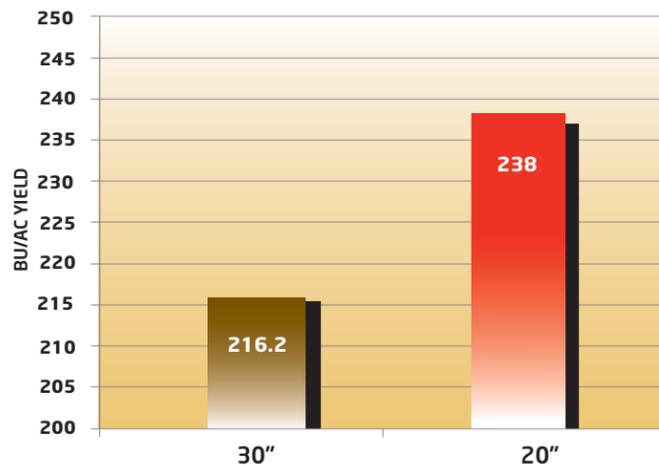
This was the second year for the comparison of 20 inch row width vs 30 inch row width trials. In addition to the population trials that we demonstrated last year, we expanded the trials to include a comparison of 6th year corn vs 1st year corn. Nitrogen rate comparisons of both crop rotations were also established for 2011. A total of 4 hybrids and 4 brands were used to evaluate row widths. Fungicide response (applied at the R2 stage) was also incorporated into the 1st yr corn trials.

### CORN 20" ROWS VS 30" ROWS

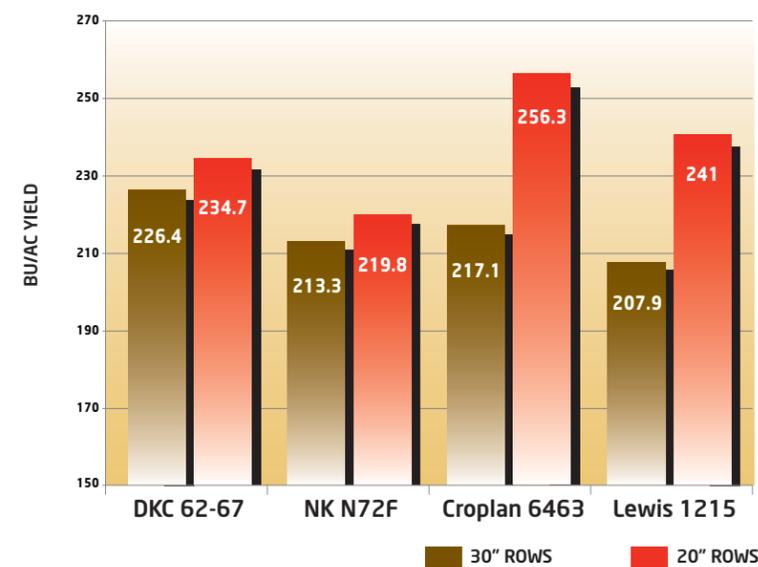
	30" Row Width	20" Row Width
6th yr Corn	176.9	188.3
1st yr Corn	216.2	238
Average all Trials	196.6	213.2
<b>Population Response</b>		
Low Pop 33,000 to 39,000	222.7	210.4
High Pop 42,000 to 48,000	221.7	229.7
<b>Nitrogen Response</b>		
Low N Rate (210 units)	207.5	241.2
High N Rate (270 units)	241.9	248.6
<b>Fungicide Response</b>		
Fungicide	217.7	223.2
No Fungicide	207.4	205.2
<b>Yield Increase</b>	10.3	18

### 2011 ROW SPACING RESULTS

1st Year Corn



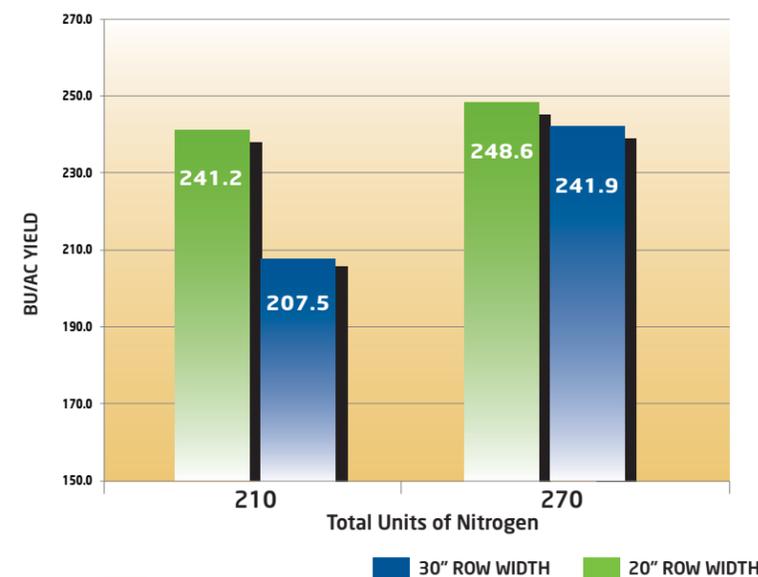
### HYBRID RESPONSE TO ROW WIDTH



Singulation and seed placement of the 20 inch row planter this year was equivalent with the 30 inch row planter. Precision planter units were installed on the 20 inch row planter and we feel this improved a lot of the 20 inch trials. This indicates how important seed placement and singulation is no matter what the row width. The chart on (page 10) sums up the overall averages of row width trial responses. Largely, the trials indicated that 20 inch row widths have an advantage over 30 inch row width especially at higher yielding environments.

The four hybrids in narrow 20 inch rows averaged 11.4 bushels per acre additional yield for the 6th year corn following corn rotation at 40,000 plant population. The 1st year corn crop rotation had an advantage of 16.6 bushels per acre with the narrow row width. When the population was dropped below 39,000 plants per acre, the advantage to the narrow row width disappeared and the advantage to the 30 inch row width grew as the population was reduced. Conversely, as the population was increased above 40,000 plants per acre, the narrow row corn continued to be an advantage over 30 inch row width. All the way up to 48,000 population, the standability and harvestability was excellent for 3 of the hybrids chosen for the population trials. One of the hybrids did begin to have some harvestability issues above 42,000 plants per acre even though the yields continued to increase as the population was increased above 42,000.

### NITROGEN RESPONSE



## SOYBEAN MATURITY & VARIETY

**Cropping History:** Corn/Bean Rotation  
**Tillage:** Conventional Tillage  
**Planting Date:** May 5 - 6, 2011  
**Harvest Date:** September 23, 2011  
**Pre-plant Herbicide:** 1.7 pt Prefix plus 22 oz Roundup WeatherMAX  
**Post Herbicide:** 26 oz Roundup WeatherMAX, ½ oz Cadet, 4 oz Hero, 1 qt Smart Trio, 1 qt B Moly per acre with 1 qt per 100 gal of Prolec  
**Population:** 140,000  
**Fungicide:** 6 oz Quadris at R4 stage  
**Crop Nutrition:** 20-60-120 applied in the fall as suspension



### Objective

To evaluate the yield response to soybean variety and maturity.

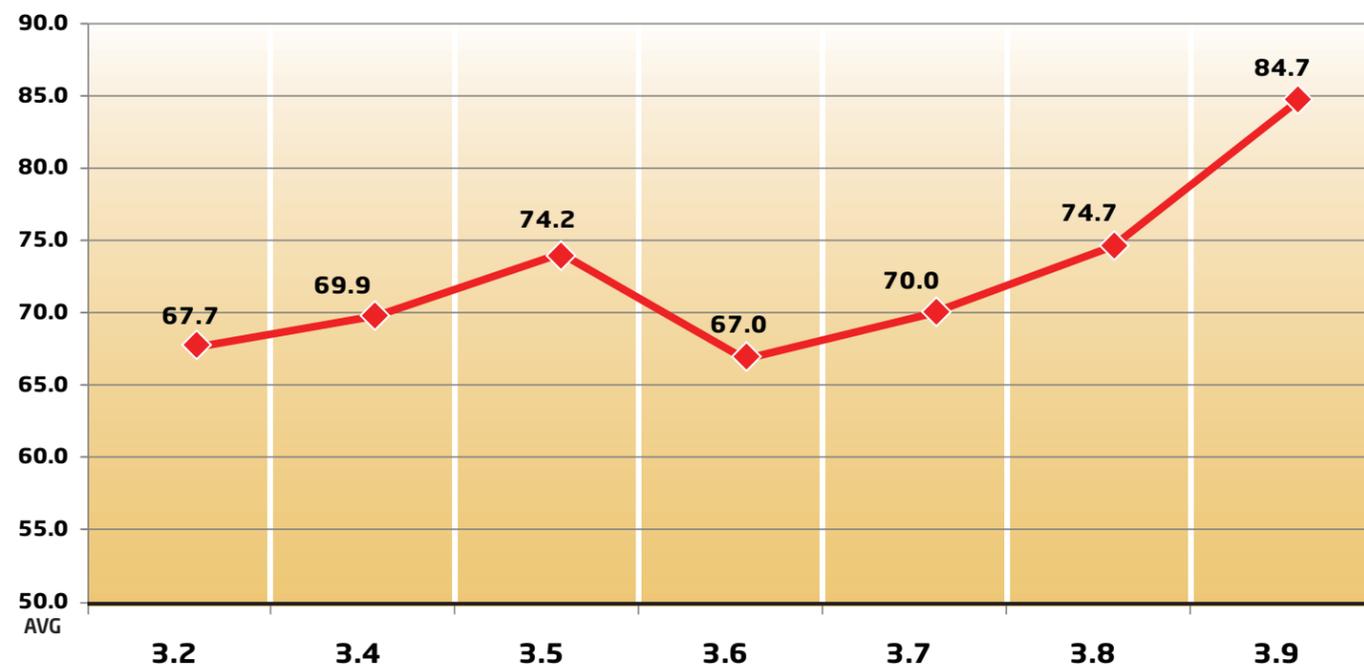
### Comments/Conclusions

Last year definitely set the high water mark for soybean yields in our Research Farm. With that record notched in the books, we started immediately after harvest on a mission to repeat our successes. Mother Nature provided the optimal fall backdrop for us to prepare, so as soon as the combine completed its final round we began chopping stalks, spreading fertilizer and deep tilling the residue back into the soil.

Our planting window occurred in the first week of May and the ground conditions were optimal for maintaining good seed to soil contact. During the growing season we experienced very low insect pressure and a lack of disease. Controlling these two issues assured us the longer maturing soybean varieties would be the highest yielding.

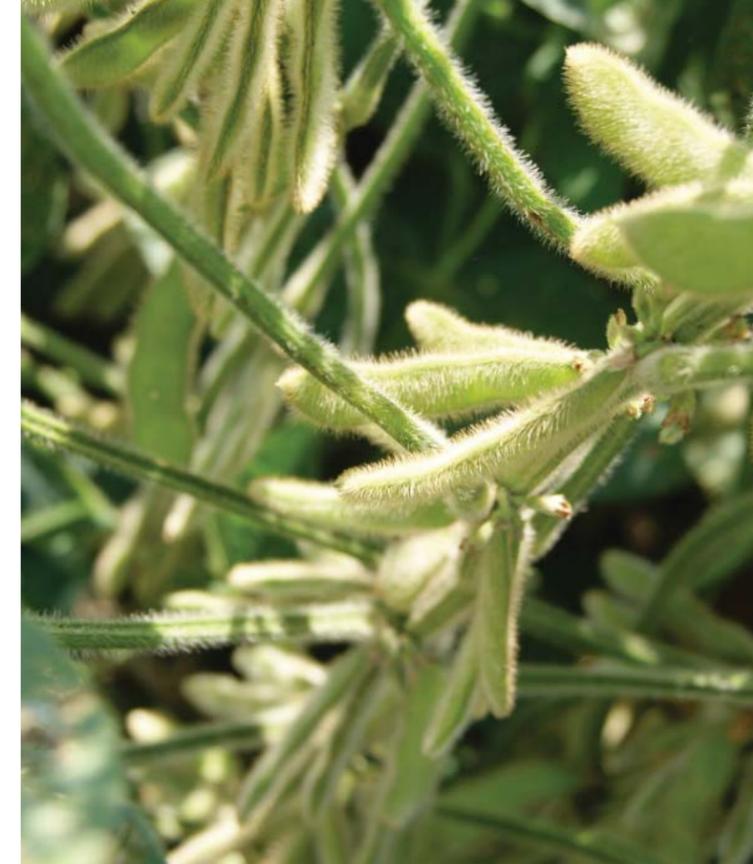
An average of 73.3 bushels per acre was recorded in the variety plots for 2011. The soybeans were planted 2 weeks later than last year which reduced the time for flowering and pod fill (especially for the shorter maturity varieties). This coupled with slow

### SOYBEAN YIELD BY MATURITY



vegetative growth during May and June created a bleak outlook for high soybean yield potential for 2011. When the hot evenings began the 2nd week in July, the soybean vegetative growth and growth stages were accelerated which led to a quick recovery of lost yield potential.

The level of vegetative feeding from Japanese beetles, Stink bugs and a few Bean Leaf beetles escalated to 15% of leaf damage on the upper canopy the first week of July. An insecticide was added to the post herbicide treatment to allow the soybeans to recover from the feeding and reduce stress during pod fill. The insecticide addition at R2 accounted for a 4.5 bushel per acre yield increase. Longer maturity soybeans out yielded short maturity beans by 14.6 bushels in the 2011 trials. The moisture variance between trials tended to follow the variety and not the maturity until we reached the 3.7 length maturity or later. The 3.8 to 4.0 maturity beans tended to have a few green leaves and an additional week of drying was needed to reach the 13% moisture level.



### SOYBEAN VARIETY TRIALS

BRAND	VARIETY	TRAITS	MATURITY	HARVEST MOISTURE	AVG. YIELD AT 13% MOISTURE	AVG. GROSS INCOME @ \$12.14/Bu
Asgrow	AG3231	RR2Y	3.2	13.2	67.7	\$821.25
Asgrow	AG3431	RR2Y	3.4	13.0	69.9	\$849.18
Asgrow	AG3631	RR2Y	3.6	13.3	61.8	\$749.83
Asgrow	AG3731	RR2Y	3.7	13.5	70.4	\$853.82
Asgrow	AG3832	RR2Y	3.8	13.4	70.1	\$850.03
Asgrow	AG3932	RR2Y	3.9	18.9	82.0	\$975.98
Pioneer	93Y70	RR	3.7	13.9	69.6	\$842.38
NK	S38K6	RR2Y	3.8	23.5	71.7	\$840.24
NK	S39U2	RR2Y	3.9	17.5	87.4	\$1,045.62
Croplan	R2C 3551	RR2Y	3.5	14.6	74.2	\$895.48
Croplan	R2C 3671	RR2Y	3.6	14.3	72.1	\$871.10
Croplan	R2C 3851	RR2Y	3.8	18.8	82.3	\$980.56
Total Average				15.7	73.3	\$ 881.30

## SOYBEAN POPULATION

Cropping History: Corn/Bean Rotation  
 Tillage: Conventional Tillage  
 Planting Date: May 5, 2011  
 Harvest Date: September 6, 2011  
 Herbicide: 1.7 pt Prefix plus 22 oz Roundup WeatherMAX  
 Post Herbicide: 26 oz of Roundup WeatherMAX with 1 qt/ac Smart Trio  
 Population: 120,000 / 140,000 / 160,000  
 Fungicide: 6 oz Quadris at R4 Stage  
 Crop Nutrition: 20-60-120 applied in the fall as a suspension



### Objective

Evaluate the yield response of each soybean variety to three different populations. Measure variety yield response to soil applied fertility and fungicide application at R4 stage.

### Comments/Conclusions

Four varieties were chosen to set up the trials for response to population. The 120,000 plant population rate was the overall highest yielding population. The shorter maturity varieties had the largest response to low population and the longest maturity variety responded best to a higher population. The shorter maturity varieties were a little more of a bushy style bean in comparison with the 4.0 maturity bean which was more erect.

A maintenance application of 20-60-120 applied in the previous fall was responsible for a 4.1 bushel per acre yield increase

compared with no P & K. Soybeans require 1.4 lbs of Potassium per bushel of beans. Over 80% of this potassium must be absorbed during the pod fill to harvest. During dry soil conditions, the diffusion of potassium to the root is reduced significantly. This is why it is so important to receive timely rain in August for top soybean production.

Fungicide yield response average 1.9 bushels per acre and was applied at R4 stage.

## VARIETY RESPONSE TO POPULATION

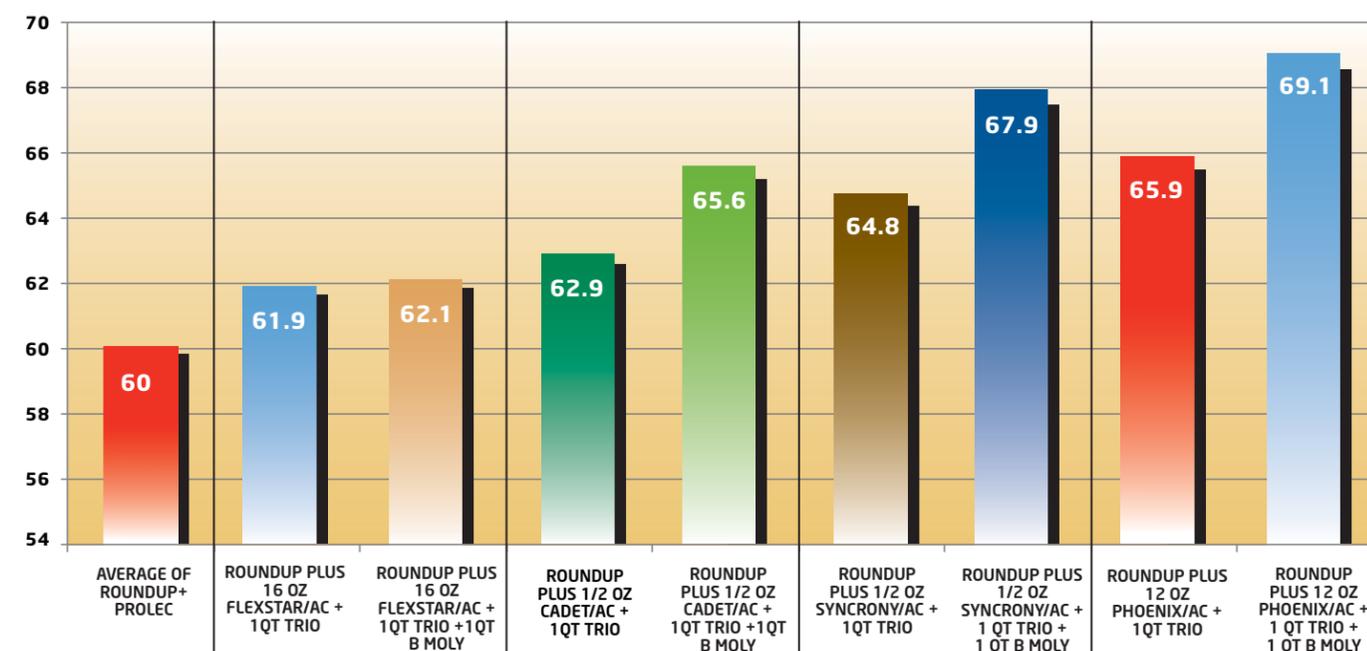
PREVIOUS CROP	VARIETY	TRAITS	MATURITY	HARVEST MOISTURE	YIELD AT 120,000	YIELD AT 140,000	YIELD AT 160,000	AVG. YIELD AT 13% MOISTURE	AVG. GROSS INCOME @ \$12.14/Bu
1st yr corn	AG3431	RR2Y	3.4	12.3	75.2	70.4	71.3	72.3	\$877.35
1st yr corn	AG3631	RR2Y	3.6	12.5	69.7	68.8	67.0	68.5	\$831.03
1st yr corn	AG3731	RR2Y	3.7	12.4	70.0	68.5	66.8	68.4	\$830.13
1st yr corn	AG4031	RR2Y	4.0	9.9	62.9	65.1	66.8	64.9	\$788.21
1st yr corn	Total Average			11.8	69.5	68.2	68.0	68.5	\$831.68

## SOYBEAN HERBICIDE STRESS MITIGATION

Cropping History: Corn/Bean Rotation  
 Tillage: Conventional Tillage  
 Planting Date: May 6, 2011  
 Harvest Date: September 23, 2011  
 Pre-plant Herbicide: 1.7 pt Prefix plus 22 oz Roundup WeatherMAX  
 Post Herbicide: 28 oz Roundup WeatherMAX, with Prolec and various tank mix partners at R2  
 Population: 140,000  
 Fungicide: 6 oz Quadris at R4 stage  
 Crop Nutrition: 20-60-120 applied in the fall as a suspension



## 2011 SOYBEAN YIELD RESPONSE TO STRESS MITIGATION



### Objective

To measure the stress mitigation of Smart Trio and/or B Moly when included with application of post herbicides with various modes of action.

### Comments/Conclusions

The 2011 stress mitigation trials demonstrated three management practices that effected soybean yields. We continue to rediscover that soybean stress management is more than just creating extra foliar growth. Soybean flash (like the above photo) from the post application of Roundup was an indication of the amount of stress soybeans were under in 2011. The warm evenings were inducing the soybeans to grow large amounts of vegetation. Nutrient deficiencies appeared as the herbicide was metabolized. Conversely, post application trials containing a 2nd mode of action added to the Roundup post application increased soybean yield over straight Roundup applications by slightly burn-

ing the vegetative tissue and slowing growth. This yield increase is not typical in most years and was a result of the soybean redirecting the manufactured protein and sugars to the pod rather than vegetation, thereby increasing yield. Depending on the mode of action used, trials captured a variation of .3 to 5 bu/ac per acre additional yield by adding the 2nd herbicide to Roundup.

Smart Trio enhanced soybean yield by reducing nutrient stress in all herbicide trials. The graph above illustrates that when compared to applications of Roundup alone, the addition of Smart Trio to these multiple modes of action tank mixes resulted in an average of 3.8 bu/ac extra yield. When B Moly was also added to the tank mixes the yield was increased an additional 2.3 bu/ac. Trials of Smart Trio mixed with Roundup alone improved yields 4.3 bu/ac per acre at the one quart per acre rate and 8.1 bushels per acre at the 2 quart rate. We will continue to evaluate and analyze use rates in 2012.

# SOYBEAN YIELD RESPONSE TO SEED TREATMENTS

**Cropping History:** Corn/Bean Rotation  
**Tillage:** Conventional Tillage  
**Planting Date:** May 9, 2011  
**Harvest Date:** October 3, 2011  
**Pre-plant Herbicide:** 1.7 pt Prefix plus 22 oz Roundup WeatherMAX  
**Post Herbicide:** 28 oz Roundup WeatherMAX, R2 stage  
 1 qt Smart Trio, 1 qt N Boron  
**Population:** 140,000  
**Fungicide:** 6 oz Quadris at R4 Stage  
**Nutrition:** 20-60-120 applied in the fall as suspension

## Objective

To evaluate the yield response to soybean seed treatments (Manganese, Zinc, Mycoriza, Acceleron).

## Comments/Conclusions

For the 2nd year in a row our seed treatment trials showed very positive results. As a comparison our trials were within what the industry saw on an average with approximately a 6.0 bushel per acre yield advantage. When we factor in an average seed treatment cost of \$11.00 per unit our return on investment was \$61.84 per acre.

The data continues to reinforce the idea that seed treatments are providing a greater advantage than just merely increasing yield. In the early vegetative stages, seed treatment allows for better plant establishment and early vigor giving way to larger plants. Chris Becker, Brandt Seed Specialist, measured a 6.4% increase in stand which followed along with last year's 7.1% increase. As he stated at Agronomy Day, "The seed treated soybeans filled pods closer to the top of the plant."

## Seed Treatment Response

Treatment	Variety	Trait	Maturity	Harvest Moisture	Yield at 140,000	Avg.Gross Income \$12.14 bu
No Acceleron	AG4005	RR	4.0	10.1 %	71.6	\$869.11
Acceleron	AG4005	RR	4.0	10.0 %	77.7	\$943.02



## Summary of 2011 Results

Corn averaged 188.1 bu. /acre over the 424 trials. Due to light showers in mid April, the corn was planted on three planting dates and provided us some additional information to ponder. The 1st year corn remained fairly constant in yield over all planting dates, while the corn on corn yields dropped as planting was delayed. Corn on corn planted on April 10th yielded 9 bushels per acre higher than the corn following soybeans. By the time we finished planting the trials on May 4th, the corn following soybean rotation was averaging 64 bu. /acre higher yield than the corn on corn.

Brandt Total Acre corn on corn yields ranged from a high of 293.4 bu. / acre to a low of 75.1 bu. /acre depending on the hybrid, population rate, nitrogen rate, phosphate and potash rate, and adding starter and/or zinc at planting. The trial design begins by incorporating all management practices that optimize yield and plant health. Next, each of the practices chosen for yield response (one at a time) is then removed or the rate is adjusted. This allows us to measure the degree of yield loss from the omission or reduction of a management practice.

Local grower field observations from the Brandt trade area plus Research Farm trials pointed to two main corn production issues: poor drainage and/or root and stalk diseases. In most cases, practices that assist the plant with disease prevention were the answer to higher yields. Residue management, higher rates of potassium and/or zinc applications were the most consistent disease control practices.

Soybean yields for 2011 averaged 69.5 bushels per acre over 120 trials. This was 13.2 bushels per acre less than last year's record. The soybeans were planted 2 weeks later than last year which reduced the time for flowering and pod fill (especially for the shorter maturity varieties). This later planting coupled with slow vegetative growth during May and June created a bleak outlook for high soybean yields in 2011. When the hot evenings began the 2nd week in July, the soybean vegetative growth and growth stages were accelerated which led to quick recovery of much of the lost yield potential.

Unlike the corn, the soybeans developed very little disease. However, the level of vegetative feeding from insects did escalate to 15% of leaf damage on the upper canopy the first week of July. Post insecticide treatments paid well in additional yield. Extra yield was also measured by applying post products such as Cadet, Phoenix, Flexstar, or Synchrony which slowed vegetative growth and rerouted the bean nutrition production into pod fill.

**Ed Corrigan**  
Brandt Technical Agronomist

## HIGHLIGHTS

- The gross profit to adding zinc was \$68 per acre. (p.9)
- Applied potash was the 2nd most important decision for yield and averaged \$173 acre. (p.7)
- A 4 year average of 12.7 bushel per acre yield advantage with Smart Trio. (p.5)