

2012 Results

BRANDT Research and Development Farm





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Preface

BRANDT is proud to present the 2012 results from our Research and Development Farm in Pleasant Plains. This year we have included some results from our Lexington trials as well. This was the eighth year for the farm at Pleasant Plains. This book is the result and culmination of the 2012 trials through harvest. It was by far the driest year we have experienced which led to much variability in the yields and results. Even so we found some very good data to share. Our goal is that you will find something of value for your operation.

They say this is the information age-and man is that true in agriculture! There are many publications, websites, plot results and articles for you to sort through. As a retailer of crop inputs we believe our responsibility to our customer is to sort through all this information and give you something you can rely on and execute. For example, at our Agronomy Day this August we brought in Sam Eathington, VP of Crop Breeding for Monsanto® so you could hear from the horse's mouth what is going on in hybrid research. We also brought in University of Illinois' Dr. Fred Below to share his findings on high yield corn production in Illinois.

As you will see, the 20-inch corn planter resulted in some sidewall compaction which may have influenced the comparisons to 30-inch rows. Even with that said, we found that in 30-inch rows the highest yielding population was 39,000. We agree with Dr. Below that you have to pick the right hybrid and then plant it at the right rate.

Seven years ago we began to run trials on strobilurin fungicides on corn to determine their effectiveness. Take a look at chart 2 on page 11 for a 7-year corn response to strobilurin fungicide with N-Boron applied at tassel. The 7-year average yield increase is 23.9 bushels/acre! I believe it has been proven and most of our customers now include fungicide and N-Boron in their crop plan.

Several years ago we introduced the benefits of BRANDT Smart Trio™ to relieve plant stress in combination with post herbicide application in corn and soybeans. Check out the double digit yield increases in 2012. We will continue to use the Research Farm to evaluate new products.

Nitrogen and fertilizer management in high yield corn is critical to production and environmental impact. We have included additional trials of starters and at planting N applications for your consideration.

Soybean seed treatments gave some impressive yield increases this year. Average yield increase across treatments was 11 bushels per acre! BRANDT has two state of the art seed treatment installations one each at Curran and Lexington.

Please review the data to draw your own conclusions. Ed Corrigan, Technical Agronomist and primary architect of these trials, has provided a summary. We value your feedback, questions and suggestions. For economic analysis and return/acre we used \$8/bushel for corn and \$16/bushel for soybeans. These were cash values when this data was developed and may have changed since then.

Tim McArdle,
 General Manager



KEY FINDS

- The 7-year average yield increase with application of a fungicide plus N-Boron on corn is 23.9 bu/ac!
- Fertility management is critical for maximum corn yields. See page 12 for some amazing visual results.
- Careful attention to planting population in corn and soybeans will increase success.
- Soybean seed treatments provide seed protection and defense against early season insects resulting in impressive yield increases. (p. 24)

CORN

HYBRID RESPONSE TO

Crop Rotation And Population

CROPPING HISTORY:
1st year corn on beans
9th year corn on corn

TILLAGE:
Conventional tillage

PLANTING DATE:
April 19, 2012

HARVEST DATE:
August 29, 2012

HERBICIDE:
2.7 qt Degree XTRA
pre-emerge

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with
1qt/ac BRANDT Smart Trio
0.5 oz of Cadet

POPULATION:
33,000 / 36,000 / 39,000

FUNGICIDE:
Quilt Xcel 14 oz/ac
plus N-Boron 1qt/ac
Hero 5 oz at R2

CROP NUTRITION:
240-90-180
(30-90-180 fall applied
suspension, 180 units of
N from ammonia with
N-Serve, 30 units of 28%
at plant).



- Higher populations added an average of 7.7 bushels per acre over the 33,000 population (\$61.60 per acre). (pg 5)
- A look at the 7 year history of the Pleasant Plains hybrid trials vs. crop rotation revealed the low 2012 crop yields still had very good value per acre, averaging \$991. (pg 7)
- The corn on corn rotation in 2006 averaged 60 bushels or \$183 per acre more profit than corn following soybeans. (pg 7)
- The corn following soybeans in 2012 averaged \$55 per acre more profit.

There was only one population of corn on corn planted in 2012 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 10.3 bushels per acre less and was 1.7% drier than the 1st year corn. The lower moisture and yield per acre of the corn on corn was primarily due to the shorter maturity hybrids not performing well on corn following corn. (pg 6 graph)

HYBRID RESPONSE TO CROP ROTATION AND POPULATION

At Pleasant Plains

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 \$8.00 BU	
1st yr Corn	DKC 57-76	GEN VT3P	107	20.9	119.1	135.3	149.5	134.6	\$992.99	
9th yr Corn	DKC 57-76	GEN VT3P		19.7			112.9	112.9	\$866.17	
1st yr Corn	DKC 59-37	GEN SS RIB	109	22.2	121.9	129.5	145.9	132.4	\$1,005.14	
9th yr Corn	DKC 59-37	GEN SS RIB		22.0			117.5	117.5	\$882.53	
1st yr Corn	DKC 63-84	VT3	113	23.9	133.1	131.6	140.7	135.1	\$1,013.01	
9th yr Corn	DKC 63-84	VT3		21.8			109.1	109.1	\$820.78	
1st yr Corn	P 1018 AM1	AM1	110	22.0	74.4	101.9	101.6	92.6	\$695.34	
9th yr Corn	P 1018 AM1	AM1		21.1			99.5	99.5	\$753.50	
1st yr Corn	DKC 61-88	GEN VT3P	111	21.4	127.5	139.8	122.3	129.9	\$980.20	
9th yr Corn	DKC 61-88	GEN VT3P		21.2			118.1	118.1	\$893.80	
1st yr Corn	DKC 62-08	GEN SS RIB	112	22.9	129.5	137.2	139.4	135.4	\$1,008.22	
9th yr Corn	DKC 62-08	GEN SS RIB		23.9			138.7	138.7	\$1,023.30	
1st yr Corn	DKC 62-97	GEN VT3P	112	21.7	128.7	148.0	140.5	139.1	\$1,046.61	
9th yr Corn	DKC 62-97	GEN VT3P		22.2			121.0	121.0	\$906.83	
1st yr Corn	DKC 63-33	GEN SS RIB	113	23.6	121.8	115.2	120.6	119.2	\$881.78	
9th yr Corn	DKC 63-33	GEN SS RIB		22.6			129.9	129.9	\$969.76	
1st yr Corn	P 1319 AM1	AM1	113	22.7	126.6	107.4	129.3	121.1	\$902.37	
9th yr Corn	P 1319 AM1	AM1		25.4			145.4	145.4	\$1,057.46	
1st yr Corn	DKC 65-19	GEN VT3P	115	22.7	162.9	166.0	151.6	160.2	\$1,193.51	
Did not plant in Corn on corn										
1st yr Corn	DKC 66-96	GEN VT3P	116	25.4	170.4	151.5	145.8	155.9	\$1,133.61	
9th yr Corn	DKC 66-96	GEN VT3P		27.0			137.1	137.1	\$981.90	
1st yr Corn	DKC 67-57	GEN VT3P	117	24.7	175.8	192.7	196.3	188.3	\$1,377.19	
9th yr Corn	DKC 67-57	GEN VT3P		26.1			201.2	201.2	\$1,453.50	
1st yr Corn	Total Average				22.8	132.6	138.0	140.3	137.0	\$1,019.16
9th yr Corn	Total Average				21.1		130.0	130.0	\$964.50	

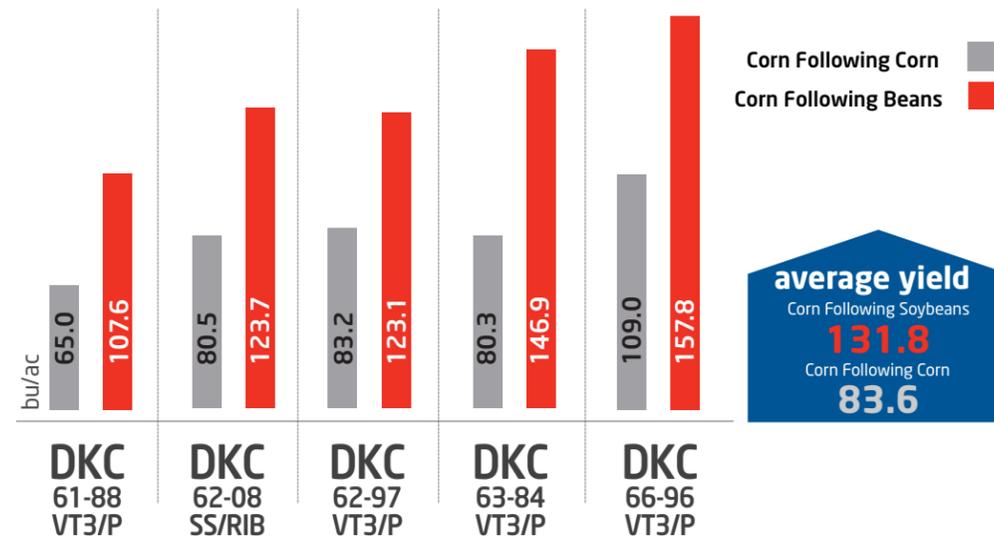
2012 AVERAGE YIELD RESPONSE TO POPULATION

1st Year Corn



A shortage of soil moisture for the 2012 corn hybrid trials led to half the normal yield. Even in this environment, 39,000 plants per acre had the best yield, suggesting that increased shading may have reduced heat stress.

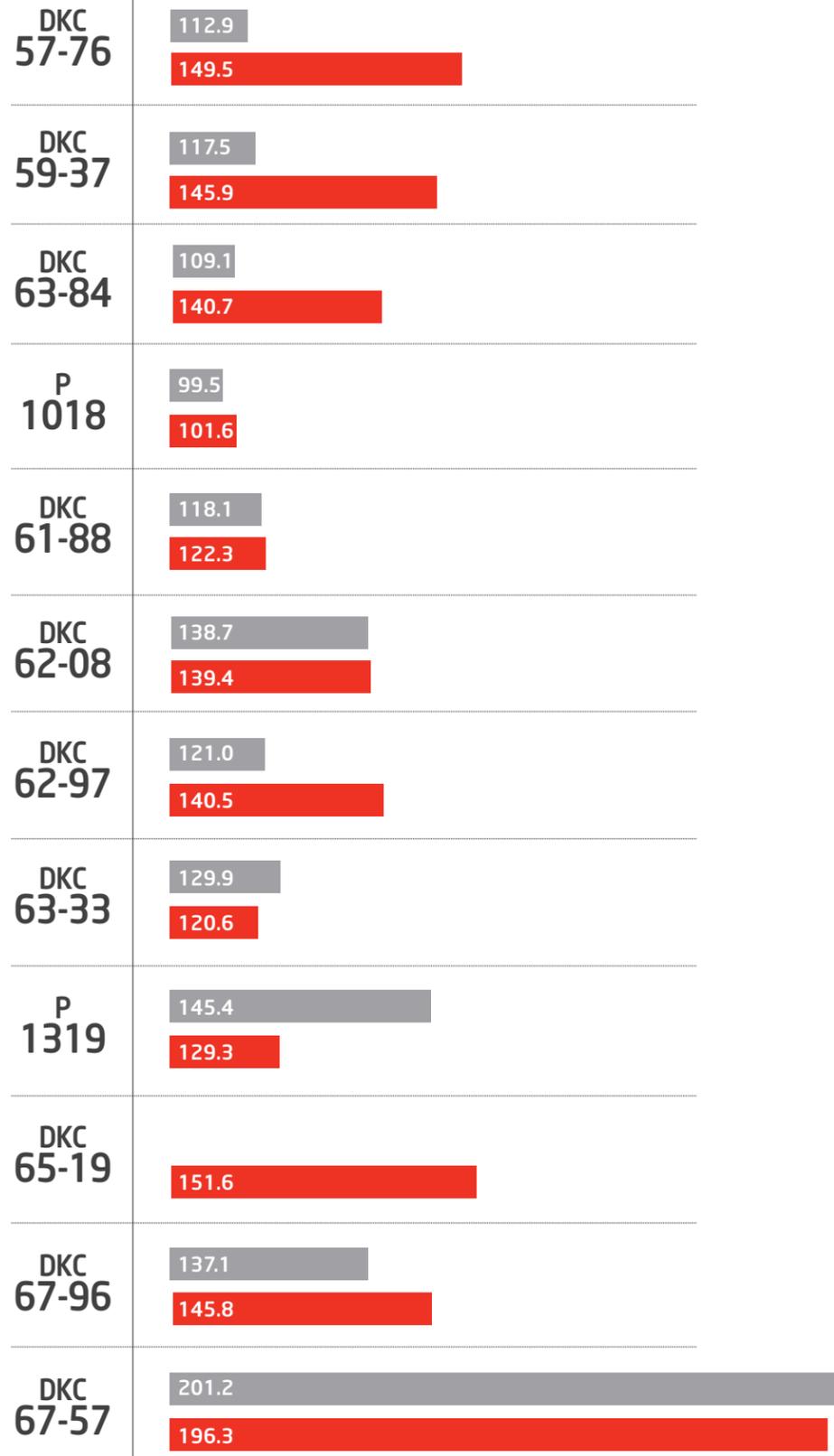
LEXINGTON RESEARCH FARM



Continuous corn averaged 48.2 bushels per acre less than corn on bean rotations. High amounts of residue in the corn on corn trial reduced the seed to soil contact necessary for even emergence. The high amount of surface residue also immobilized a significant amount of 28% nitrogen further limiting yields.

Crop Rotation

1st Year Corn vs. 9th Year Corn at 39,000 (Pleasant Plains Research Farm)



■ 9th year corn
■ 1st year corn

A tremendous amount of yield variation was prominent this year from hybrid to hybrid. Hybrids with a longer maturity rating combined with an early flowering date tended to fill the ear very slowly after pollination and maximized yields. Conversely, the shorter maturing hybrid yields were reduced especially in corn on corn rotations partially due to the planting date of April 19. A number of trial comparisons of crop rotation in the area favored continuous corn rotation when planted earlier in 2012. Four of the 12 hybrids had an enhanced yield on the continuous corn rotation; all were 113 day maturity or longer.

Early planting in 2012 along with a dry spring caused a reduction in the height of plants and a converse increase in root mass. As the heat began to stress the corn, some of the hybrids reacted by rolling the leaves to conserve moisture. We observed that the tighter the roll the higher the yields. *By rolling during a portion of the day, a hybrid conserves its moisture and maximizes its maturity.*



The 7-year graph below illustrates the devastating impact of the 2012 drought on corn production. However, it also demonstrates the increase in value of the crop over those years. In 2006, continuous corn out yielded the corn/bean rotation by 60 bushels per acre.

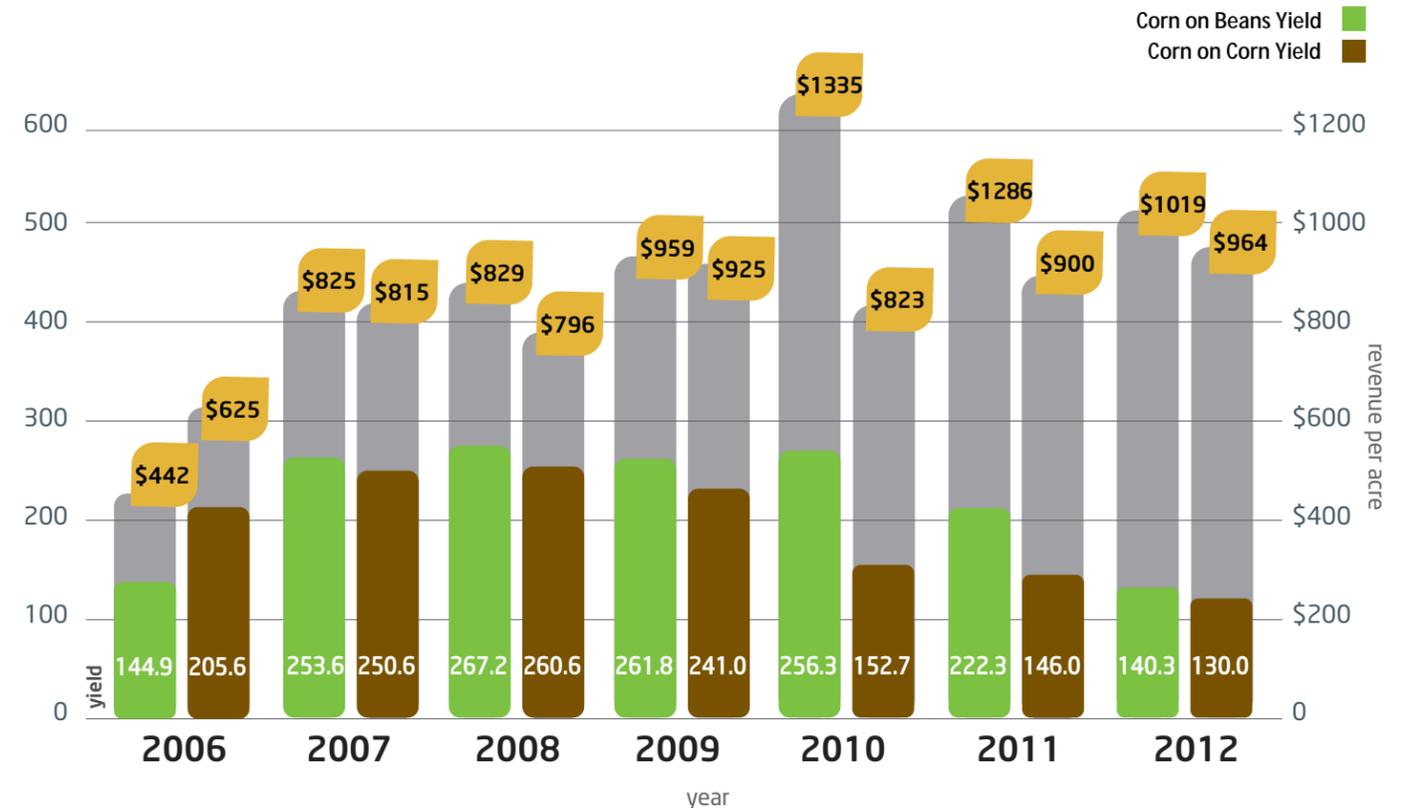
Every year since 2006, the corn/bean rotation has been the winner. 2010 and 2011 crop years average 90 bushels per acre more in the same rotation, while 2012 crop rotation averaged only 10 bushels per acre advantage to corn on beans.

Does this indicate that the continuous corn rotation is headed back to a leading position for 2013? Weather, insects and individual field management is what has dictated the outcome of the winner over each of the last seven years, so we would look for this next year's weather to help pick the winner again.



CROP ROTATION RESULTS OF HYBRID TRIAL AVERAGES

Data was collected from the past seven plot book hybrid trials using the crop prices from that year.



CORN

Stimulants and Stress Mitigation

CROPPING HISTORY:
1st year corn on beans
9th year corn on corn

TILLAGE:
Conventional tillage

PLANTING DATE:
March 30, 2012

HARVEST DATE:
August 22, 2012

HERBICIDE:
2.7 qt Degree
XTRA pre-emerge

POST HERBICIDE:
32 oz of Roundup
WeatherMAX
0.5 oz of Cadet

POPULATION:
39,000

FUNGICIDE:
Quilt Xcel 14 oz/ac plus
N-Boron 1qt/ac
Hero 5 oz at R2

CROP NUTRITION:
240-90-180
(30-90-180 fall applied
suspension, 180 units of
ammonia with N-Serve,
30 units of 28% at plant.)



- In these trials the 9th year corn out yielded the 1st year corn by 53.3 bushels per acre. Just like last year, the early planting date favored the continuous corn stress mitigation.
- The V5 strobilurin fungicide treatments did have a small yield increase in side by side comparisons this year.

- The addition of BRANDT Smart Trio, Manni-Plex B Moly, and N Boost reduced plant stress at the V5 application timing.
- The addition of BRANDT Smart Trio to fungicides at V5 improved yields.

STRESS MITIGATION

Plot Averages

1st Year Corn 115

9th Year Corn 168.3

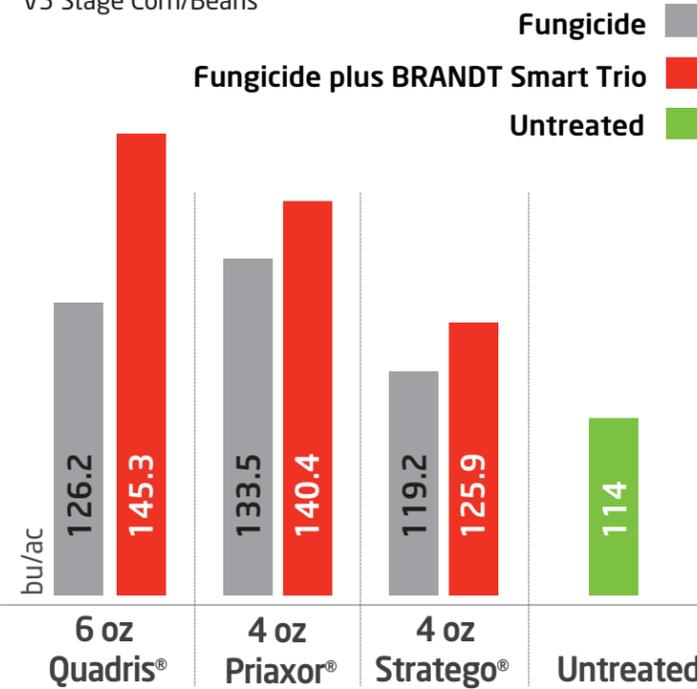
Continuous corn out yielded the corn/soybean rotation in the stress mitigation trials for the second year in a row. An early planting date of March 31 in combination with good residue and nutrition management led to a 53 bushel per acre advantage.

Excellent corn on corn hybrid

This is second year we've seen a positive response to corn on corn with this hybrid group. It out yielded all hybrids in our 20 vs 30 corn on corn trial. (pg 17)

FUNGICIDE TRIALS

V5 Stage Corn/Beans



Each of the V5 stage strobilurin fungicide trials had a positive impact this year in the corn/bean rotation. Corn at this stage did not display any disease symptoms; however we did observe a visual response (leaf speckles) from the addition of Cadet to the post Roundup.

The speckling from the Cadet herbicide was more noticeable in the corn/soybean rotation. Continuous corn trials did not speckle as much nor did it have a positive response to strobilurin fungicide at V5.

This leads us to believe that V5 corn that is under temporary leaf necrosis may have an increased yield response to strobilurin fungicides.

BRANDT SMART TRIO 2012 YIELD RESPONSE

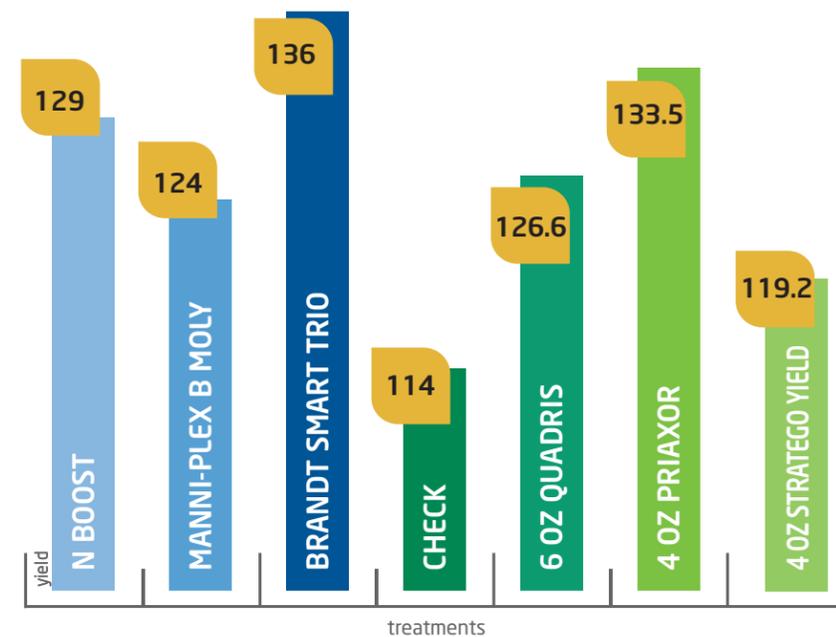


Average of 8 Trials

BRANDT Smart Trio at the V5 stage did "noticeably" reduce the stress from the combination of Roundup® and Cadet®, averaging 22 bushels per acre more corn over the 8 random trials.

V5 STAGE YIELD RESPONSES

2012 Additives to Glyphosate and Cadet



FACT

V5 stage of corn growth is very significant in determining ear size (girth).

All the treatment additives to the Roundup/Cadet combination were successful with improving the yield at harvest. BRANDT Smart Trio provided the most stress relief at the least cost per acre.

CORN

BRANDT Total Acre®

CROPPING HISTORY:
7th and 9th year corn o

TILLAGE:
Conventional tillage

PLANTING DATE:
March 31, 2012

HARVEST DATE:
August 16, 2012

HERBICIDE:
2.7 qt Degree XTRA pre-emerge

POST HERBICIDE:
32 oz of Roundup WeatherMAX with 1 qt/ac BRANDT Smart Trio 0.5 oz of Cadet

POPULATION:
36,000 / 39,000

FUNGICIDE:
Quilt Xcel 14 oz/ac plus N-Boron 1qt/ac Hero 5 oz at R2

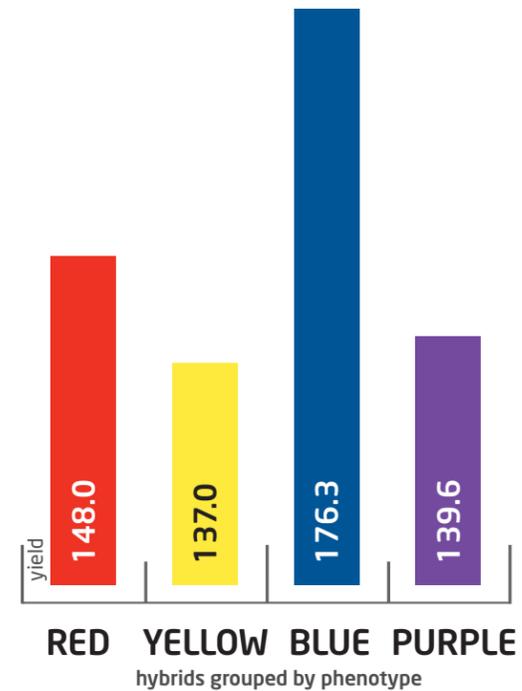
CROP NUTRITION:
Various combinations of nitrogen, phosphorus, and potash



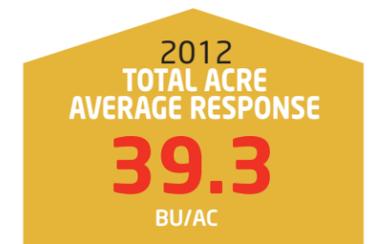
- The hot and dry growing conditions of 2012 reduced the yields. However the yield response to each variable was significant.
- Strobilurin (active ingredient in some fungicides) relieved tremendous plant stress and accounted for a large percentage of the yield in 2012.
- Phosphate and potassium applications continued to be a valuable investment.
- Soil insecticide applications made a significant yield contribution.
- An application of zinc, as well as starter at planting, was very consistent with previous work.
- Hybrid choice continued to be the most responsive variable in the 2-year trials.

TOTAL ACRE POLE POSITIONS	2011	2012	2 YR AVERAGE
1. Hybrid Variance	56.2 bu/ac	39.3 bu/ac	47.7 bu/ac
2. Strobilurin Fungicide Response	14.1 bu/ac	51.7 bu/ac	32.9 bu/ac
3. P&K Rate	27.4 bu/ac	23.3 bu/ac	25.4 bu/ac
4. Nitrogen Rate	18.3 bu/ac	16.3 bu/ac	17.3 bu/ac
5. Zinc (1qt/ac)	10.9 bu/ac	8.1 bu/ac	9.5 bu/ac
6. Population Rate	13.9 bu/ac	3.7 bu/ac	8.8 bu/ac
7. Starter (28% at plant)	4.5 bu/ac	4.0 bu/ac	4.3 bu/ac
8. Soil Insecticide	20.6 bu/ac	12.3 bu/ac	16.4 bu/ac

1 HYBRID VARIANCE

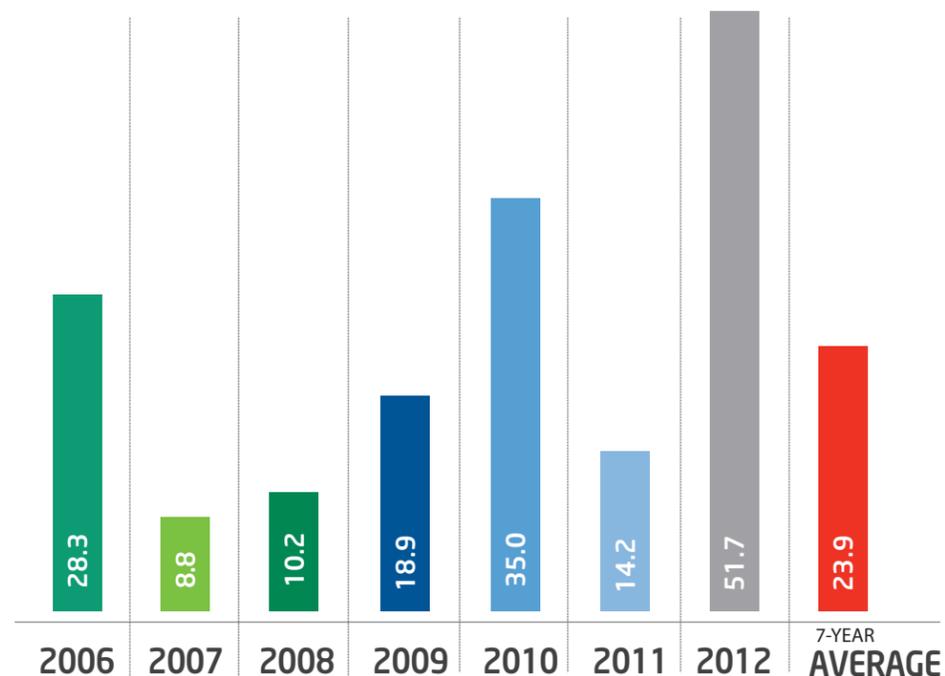


Total Acre® is focused on measuring the yield impact of various management practices with each hybrid phenotype (physical characteristics) using an omission plot design. Currently, BRANDT has defined five phenotype groups that today's hybrids are classified into. We have assigned a color to each of those groups. The graph to the left indicates the wide variations in yield response found in this year's color groups with a (4 of the 5) range of 39.3 bushels per acre. The most yield influencing management practice continues to be hybrid selection at the 1st pole position.

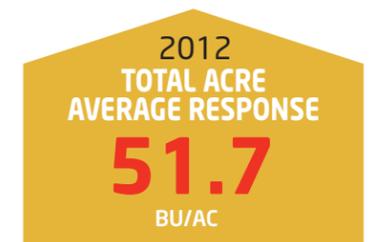


2 7-YEAR STROBILURIN FUNGICIDE WITH N-BORON

Yield Response Tassel Stage Corn



The Pleasant Plains 7-year average response to tassel stage applications of strobilurin fungicide with the addition of N-Boron is 23.9 bushels per acre. This year's drought conditions recorded the highest response to the application over the 7-year span. Leaf and stalk disease were minimal this year due to the dry conditions. However strobilurin fungicide's ability to slow the plant's metabolism for a 21 day window after the application increased yield. The slower metabolism increased the efficiency of the corn plant during grain fill. N-Boron assisted the corn plant with the transient boron deficiency during early flowering stage documented by professor Fred Below.





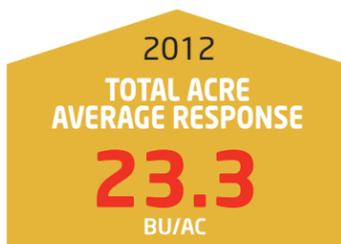
FALL APPLIED 30-90-180

NO APPLIED P&K

3 P&K RESULT

136.7 No P&K

160 With P&K



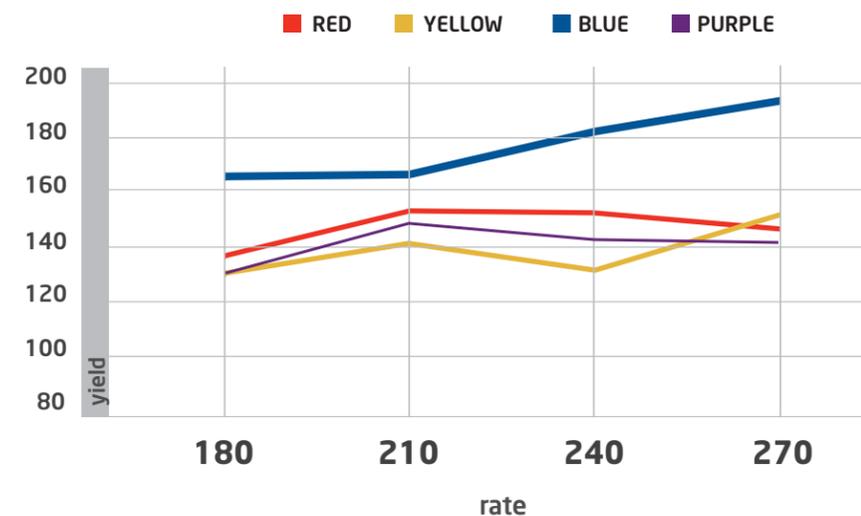
Gross dollar of return on investment is \$186 per acre value at \$8.00 corn.

We are utilizing Blocks 9-12 at the Research Farm to demonstrate our Total Acre® Solution. Part of this proprietary solution is to evaluate hybrid performance to applied nutrients. Over the past few years, we have created two different management zones, one involving a 'high tech' approach and another following 'standard' recommendation practices.

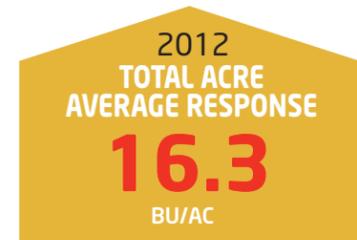
Our 'high tech' method aims to maximize corn production. Therefore, we have a customized nutrient build program in place. The 'standard' method is based on soil test levels established by university testing. The levels in this block are more than sufficient. Their recommendation does not call for adding additional fertilizer, none was applied. As you can see from the photo, the corn in the 'high tech' zone has a greater nutrient use efficiency at the stage of growth and is tasseling much more consistently/uniformly. This is especially evident when drier conditions exist.

P&K applications increased yield by an average of 23.3 bushels per acre in the drought of 2012. That is a \$186 per acre value at \$8.00 corn. As you can see by the picture above, it also gave us a visual response at pollination. The corn trials with applied P&K tasseled earlier and were able to endure the heat and stress. At harvest, the P&K applied plot had noticeably improved stalks above the ear.

4 NITROGEN RATE

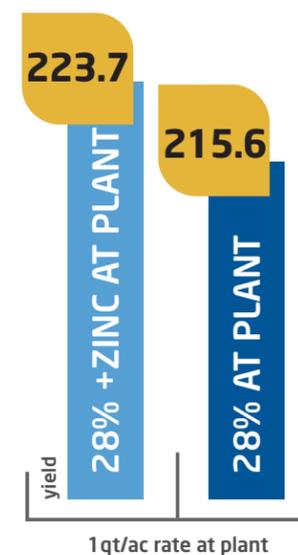


Only one hybrid group responded to increased nitrogen above 210 units. The Blue group was also the highest yielding group in the 2012 Total Acre trial. This same group had a significant response to phosphorus and potassium. This is the second year in a row that no significant yield increase was observed above 210 total units of N per acre. The blue group hybrid is the only group that has responded above 210 N units during the two year period. Matching your Blue group hybrid to a higher total rate of N (or side dress nitrogen) maximizes its performance.

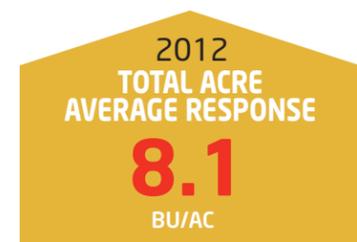


5 ZINC RESPONSE

At Plant

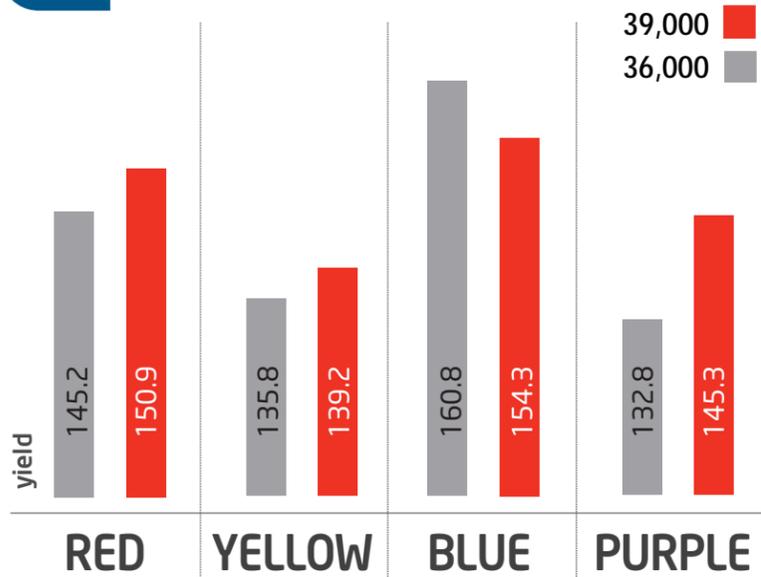


The additions of chelated zinc to starter applications (banded at planting) gave a 9.5 bushel per acre yield increase over the past two years. Soils in the central Illinois area have good levels of zinc. However those same soils have good supplying power of phosphorus which ties up the zinc rendering it unavailable to the emerging corn plants. Zinc has limited mobility in the soil and therefore must be applied close to the row for maximum yield increase.

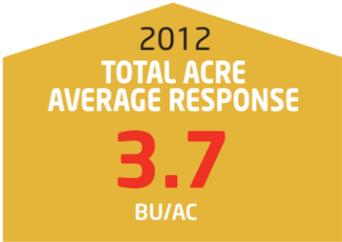


6

POPULATION RATE



The 192 trial average of 3.7 bushels per acre response to population gave a \$29.60 per acre value at \$8 corn. Three of the four hybrid groups responded positively to the increase of population from 36,000 to 39,000. The Blue hybrid group that responded to high rates of nitrogen was unresponsive when population was raised above 36,000 plants per acre.



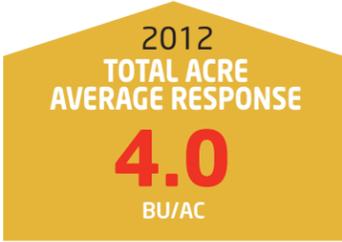
FACT
Dryness allowed the insects to heavily impact the crop.

7

STARTER

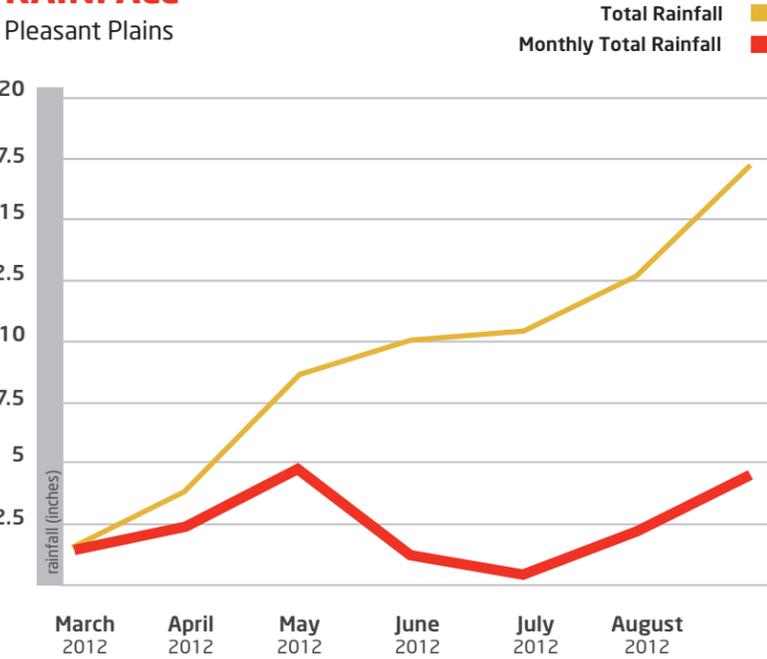
10 gal of 28% N at planting

Visual response to the starter treatments were again observed beginning at the 3 leaf stage and continued until tassel stage. The starter treated corn plants were darker green and slightly taller than untreated rows. In these trials the fall applied NH3 was reduced in the areas where starter was applied.



RAINFALL

Pleasant Plains



The above rainfall graph (red line) displays the spot in early May that was the turning point away from normal rainfall and record yields for the 2012 crop year. Corn planted after May 1 at the Research Farm never saw a day with abundant moisture. The May planting date resulted in 58 bushels per acre yield reduction compared to corn planted just 2 weeks earlier in April. (See graph on page 36)

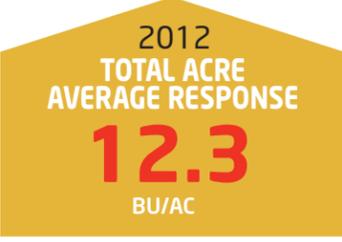
A dry June, July, and early August, coupled with record heat, sparked heavy insect pressure on both corn and soybeans in 2012. The shortage of rain increased rootworm pressure on corn due to low mortality from drowning as they hatched in early June. The third week of June also began the battle against spider mites and Japanese beetles. The graph on page 22 documented a five bushels per acre response to an insecticide for soybeans at R1. This equated to an \$80 per acre value for treatment.

8

SOIL INSECTICIDE

At Planting

Soil insecticide applications continue to be a very good investment to maximize yields. Insecticide added to the liquid starter banded on the surface behind the closing wheels averaged 12.3 bushels per acre yield increase. In this plot we observed low rootworm pressure conditions.



223.8 No Insecticide

236.1 Insecticide at Planting

- Placed on treated corn
- Capture 5 oz/acre
- Banded on Surface

20 Inch vs 30 Inch Row Width Trials

CROPPING HISTORY:
1st year corn on beans
8th year corn on corn

TILLAGE:
Conventional tillage

PLANTING DATE:
April 19, 2012

HARVEST DATE:
September 9, 2012

HERBICIDE:
2.7 qt Degree XTRA
pre-emerge

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with
1qt/ac BRANDT Smart Trio
0.5 oz of Cadet

POPULATION:
33,000 / 36,000 / 39,000
42,000 / 45,000 / 48,000

FUNGICIDE:
Quilt Xcel 14 oz/ac plus
N-Boron 1qt/ac
Hero 5 oz at R2

CROP NUTRITION:
240-90-180
(30-90-180 fall applied
suspension, 180 units of
ammonia with N-Serve,
30 units of 28% at plant).



48K, 45K, 42K Population
20" Row Spacing

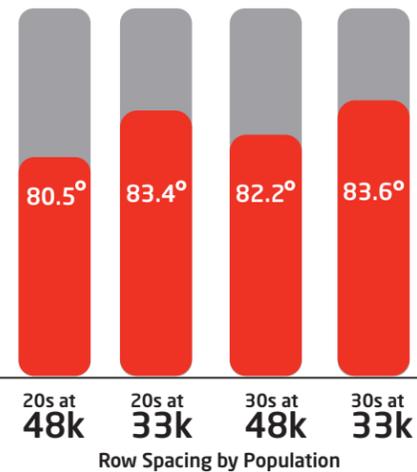


39K, 36K, 33K Population
20" Row Spacing

The 20-inch rows had on average a 7.5-inch spacing between plants. Narrower row widths and higher populations improved soil shading which reduced the soil temperature. Root growth is minimal at soil temperatures above 90 degrees. (See soil temperature chart)

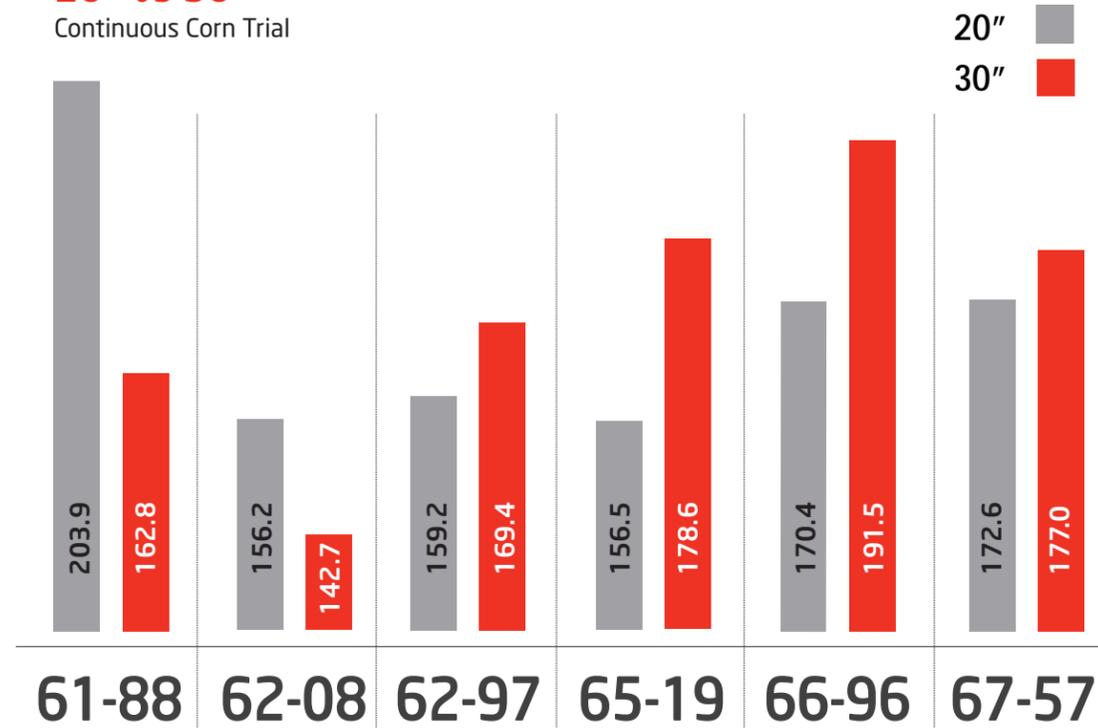
- 6 readings were taken in each population zone
- 6 additional readings were taken within each specific hybrid
- Readings were taken mid-day

SOIL TEMPERATURE BY ROW SPACING



20" vs 30"

Continuous Corn Trial



DeKalb®

We have been following the advancements of 20-inch row corn for the past three years. Each year has provided our staff with valuable information to enable us to create the best recommendation for narrow row corn.

In Block 14 of our 20 vs 30s row spacing trials, we have numerous hybrids planted at populations varying from 33,000 to 48,000 plants per acre. During an in-field root dig at approximately VT stage of growth we noticed the following symptomology:

- Root structure exhibited a Hachet or Mohawk effect. The most common cause for this is too much down force pressure at planting, creating a sidewall compaction layer that does not allow the corn plant's roots to permeate the soil horizontally. This situation would have been worse if our planting conditions were wetter.

- Another piece of information we uncovered related to plant spacing:

- The 30-inch row had on average a 5.5 inch spacing between plants.
- At lower populations both row spacing root systems looked decent. However, when we increased to higher populations, the 30-inch row's root system got significantly smaller due to increased competition. The 30-inch row corn's roots were intermingled with one another and since it's drier they are competing for water and nutrients while 20s were less restricted.

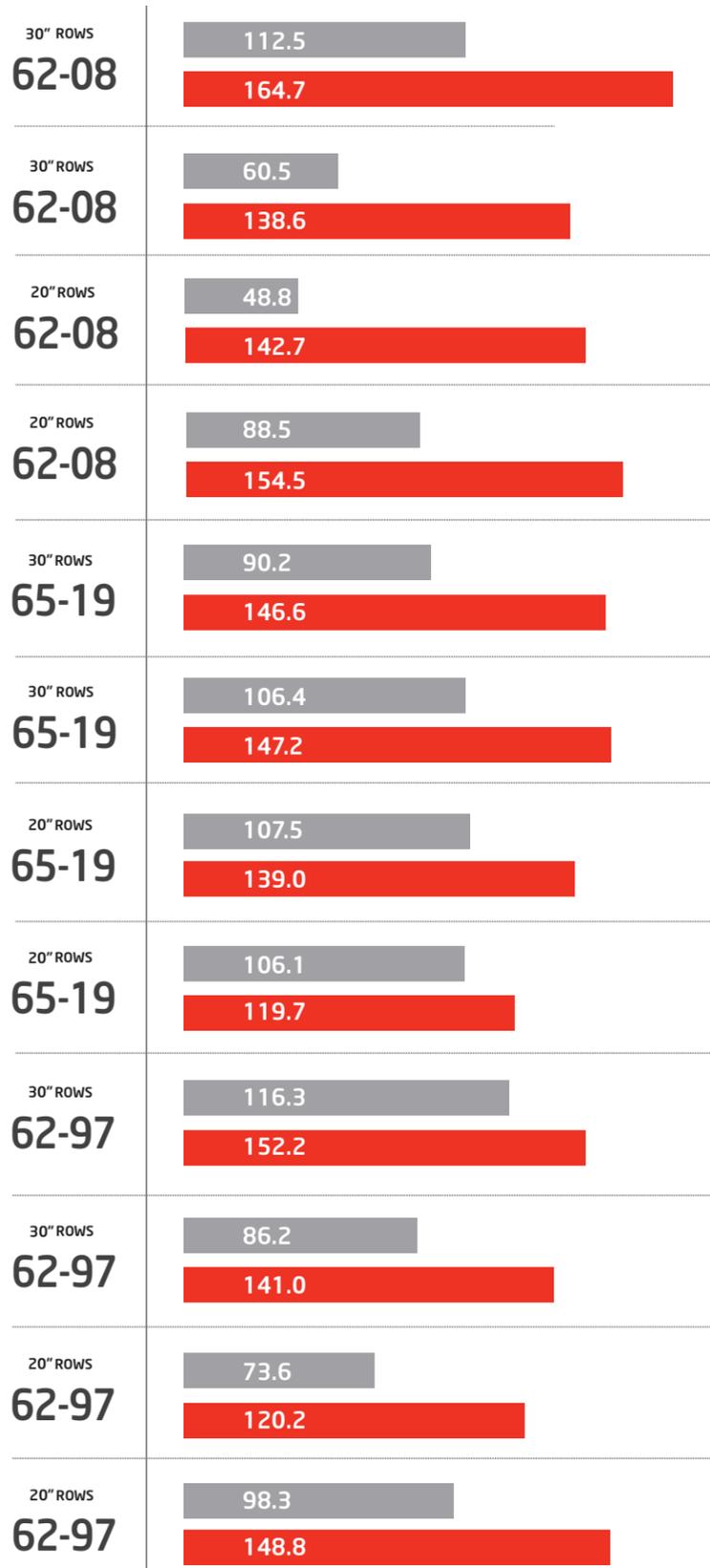


20" Row Spacing "Hachet Roots"

Due to complications with down pressure, the 20-inch row trial was placed at a disadvantage.

STROBILURIN FUNGICIDE HYBRID RESULTS

Tassel Stage Application



Strobilurin Fungicide at Tassel ■
No Strobilurin Fungicide at Tassel ■

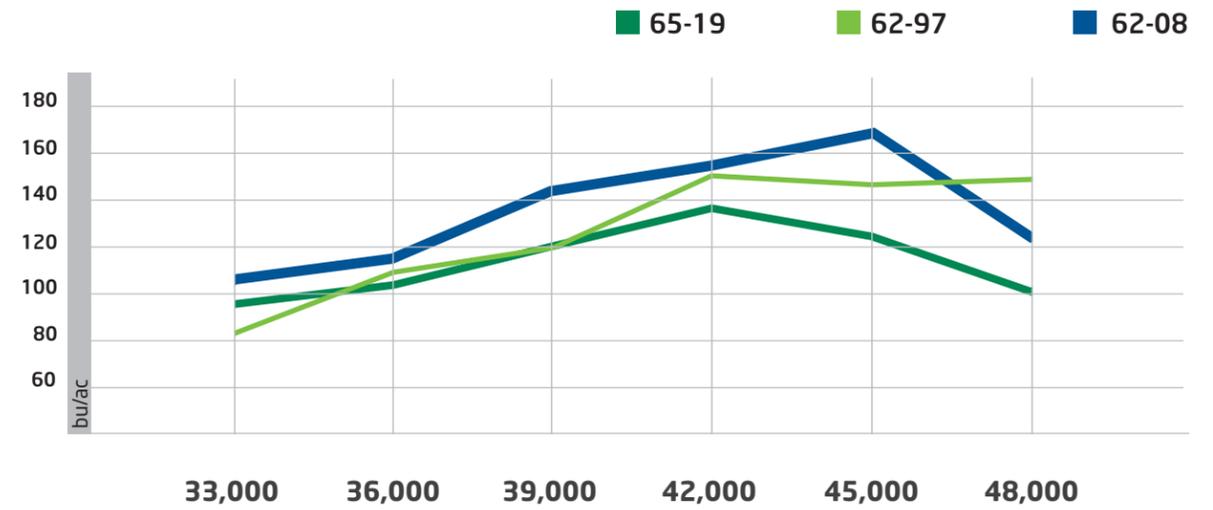
As you can see from the chart on this page, strobilurin fungicide applied at VT/R1 stage was very beneficial this year regardless of the row spacing. *This data continues to positively reinforce our previous years experience with strobilurin fungicides. It pays...when a properly timed application is applied in a stressful or non-stressful year.* The environment this season just happened to be stressful enough that timing made all the difference in the world because as you remember we did not have disease. The combination of the high temperatures and the need to assist the corn plant with pollination led us to apply products at the front end of the application window. We needed to relax (decreases respiration) the plant and allow it to mature at a normal pace.

average yield
strobilurin fungicide at tassel
142.9
without
91.2



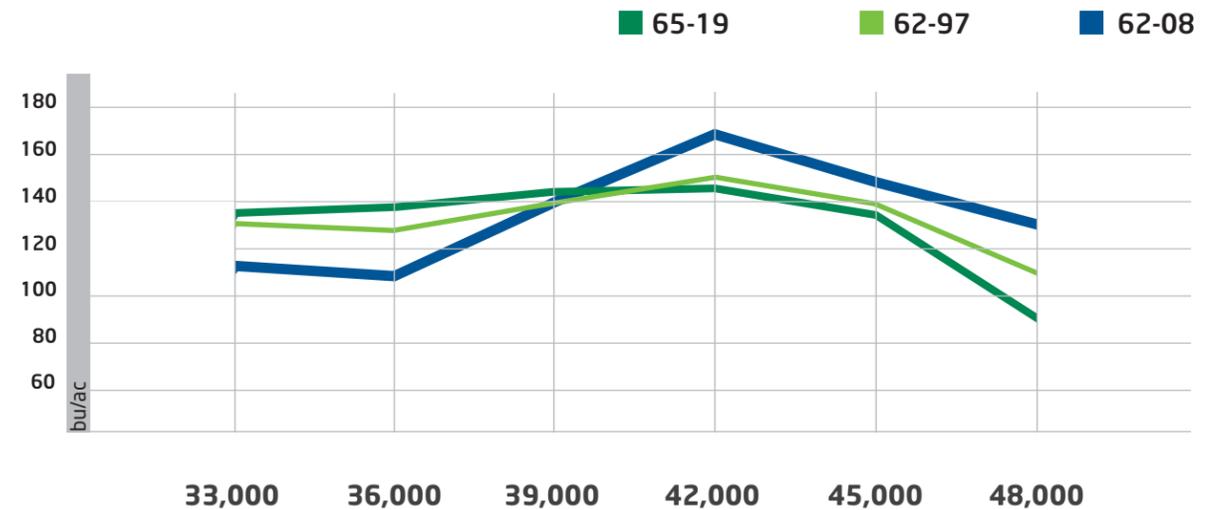
20" ROW CORN

Population Response



30" ROW CORN

Population Response



As we continue to research the effects of row spacing our findings continue to point out:

- Proper hybrid selection is critical for success when planting narrow row corn.
 - Select a shorter profile hybrid with a wider leaf
 - Start with a better than average soil nutrient prerequisite to maximize the flowering performance of hybrids

- Phosphate and potassium levels need to exceed university expected levels
- pH should be balanced
- Seed placement becomes more important when planting narrow rows (20 inch).
 - 7.0 to 7.5 inch plant spacing seems to be ideal

FACT

Increasing plant populations maximizes narrow row corn.

Precision Planting



FieldView App

Throughout the years the BRANDT Research and Development Farm has proven that proper decision making is the key to success. This decision making process does not take place at any one time throughout the growing season but rather takes place year around. One tool spotlighted at this year's agronomy day to was Precision Planting's FieldView iPad app. By pairing FieldView to the ever popular Precision Planting 20/20 SeedSense® Monitor System; growers quickly and accurately make

profitable decisions by displaying real time planter performance items such as population, singulation, spacing, down force, and ground contact. From a simple speed change based on the ground contact of the planter row unit or a change in vacuum pressure after switching hybrids, this tool has proven that it can aid in decisions that will increase yield and productivity!

SINGULATION MAP



Too often, seeds hit the sensor on their way down the seed tube. When this happens, seeds ricochet down the tube causing the familiar skip/double pattern in the field. Precision® Planting BullsEye Seed Tubes reduce these errors with a simple offset that moves the sensor out of the way of the seed path.

Another means to improve seed singulation and spacing for vacuum planters is to install eSet meters.

- **Singulate any seed size or shape** – there's no pocket or cell, which means the disk is not seed sensitive.
- **Improved seed release** – the raised platform means seeds release down the center of the seed tube minimizing seed tube ricochet.
- **No adjustments** – you get 98.5%+ singulation on almost every seed type without adjusting vac or double eliminators.
- **Better seed agitation** – seed treatments can inhibit singulation because seeds pack together at the bottom of the meter. eSet has aggressive seed agitation that keeps the seed pool fluid for better loading.

DOWN FORCE PRESSURE MAP



Root zone compaction is caused when there is excessive down force applied to the row unit during planting. That compaction cuts yields by potentially:

- Reducing germination rates and lowering plant count
- Increasing plant stress, reducing ear girth and length
- Stressing plants at pollination during dry years with hot summers

These factors need to be considered not only with different soil types but also environmental conditions at planting.

The Precision Planting systems automatically measure and manage down force, enabling the planter to run at an optimal level and maintaining uniform seeding depth.



- FieldView App
- Down Force
- Singulation BullsEye Seed Tubes eSet

SOYBEANS

Stress Mitigation

CROPPING HISTORY:
Corn/Bean Rotation

TILLAGE:
Conventional tillage

PLANTING DATE:
April 23, 2012

HARVEST DATE:
September 20, 2012

HERBICIDE:
Valor 3 oz/ac

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with
1 qt/ac BRANDT Smart Trio

POPULATION:
120,000

FUNGICIDE:
Quadris 6 oz/ac plus
Manni-Plex B Moly 1qt/ac,
Hero 5 oz at R3

CROP NUTRITION:
20-60-120 suspension
Applied in the fall



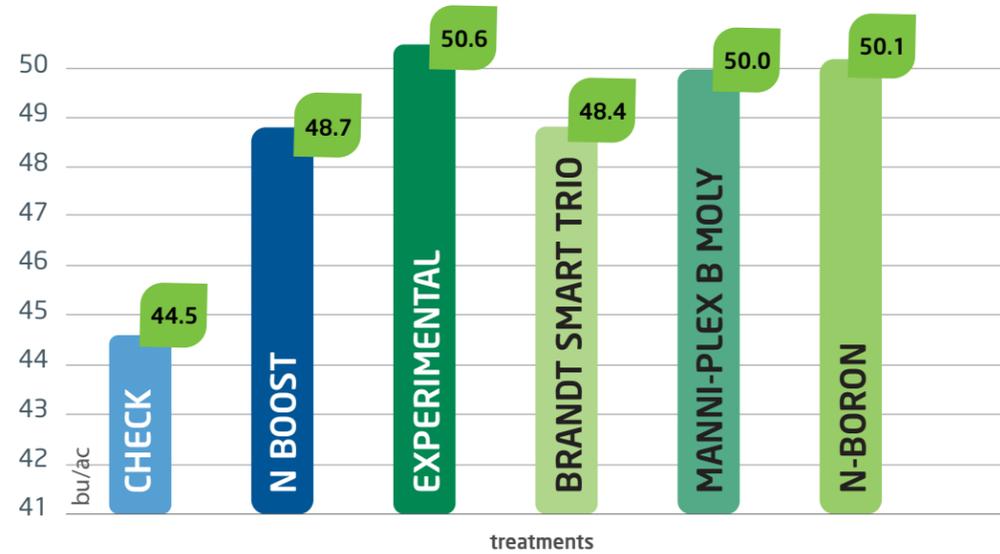
- Fungicides applied at R4 stage soybeans averaged 4.0 more bushels per acre in 2012.
- A five bushel per acre yield advantage was recorded (for the third year in a row) by applying a foliar insecticide to soybeans at first flower stage for Japanese beetle feeding.
- Mitigating crop stress by adding micronutrient mixes to post applications improve yield and ROI.

JAPANESE BEETLE CONTROL

Insecticide applied at first bloom



STRESS MITIGATION SOYBEAN TRIALS



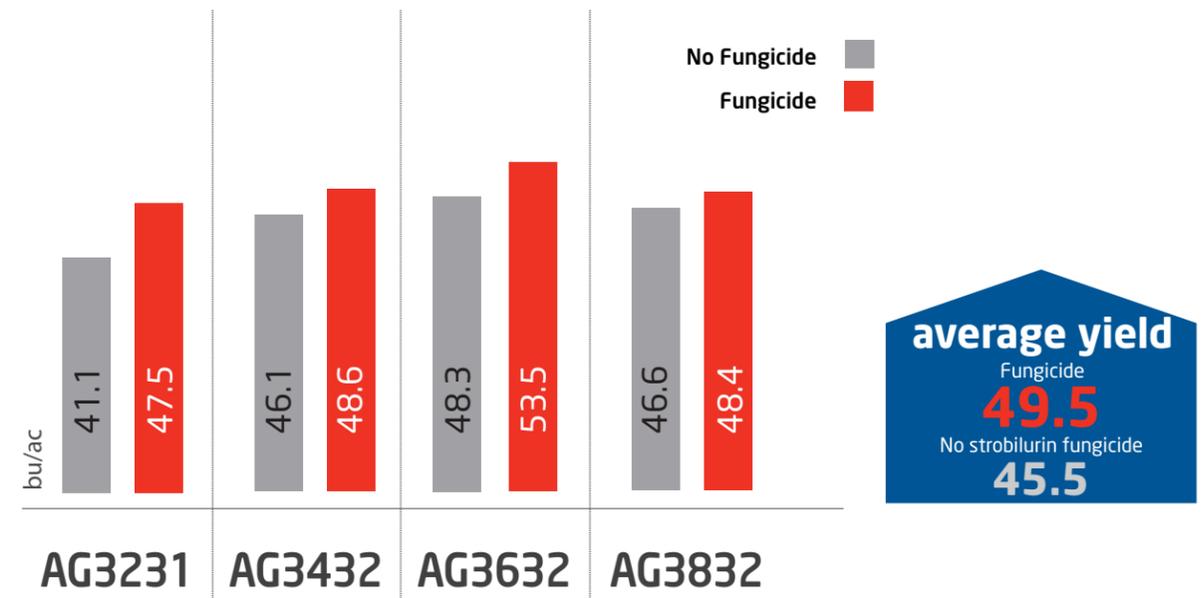
These trials were conducted to evaluate the performance of BRANDT foliar nutritionals on soybeans. The value of applying a micronutrient or plant stimulant was very profitable in 2012. The treatments averaged over five bushels per acre, equating to a \$75 per acre value at \$16 per bushel soybeans. The applications were timed for early R3 stage soybean and contained an insecticide (check included) for spider mites which

were beginning to spread through the plots. Each of the products assisted the soybean plants with recovery from the low pressure spider mites. **Note:** Soybean "check" strips without stimulants or micronutrients added to the insecticide for spider mites had less green stems at harvest. Even though the stems were brown, the check strips were plugging the head worse than treated strips.

FACT

Soybean flash can occur when the plant receives a large dose of glyphosate which reduces photosynthesis

FUNGICIDE TRIALS



Fungicide treated soybeans averaged four bushels per acre over the check for a \$60 per acre value. The soybeans had very little to no disease due to the dry weather. They were under

a tremendous amount of drought stress and recovering from spider mites. The strobilurin portion of the fungicide assisted the soybean yield by increasing photosynthesis and protein production.

Seed Treatment

CROPPING HISTORY:
Corn/Bean Rotation

TILLAGE:
Conventional tillage

PLANTING DATE:
April 23, 2012

HARVEST DATE:
September 20, 2012

HERBICIDE:
Valor 3 oz/ac

POST HERBICIDE:
32 oz of Roundup WeatherMAX with 1qt/ac BRANDT Smart Trio

POPULATION:
120,000

FUNGICIDE:
Quadris 6 oz/ac plus Manni-Plex B Moly 1qt/ac, Hero 5 oz at R3

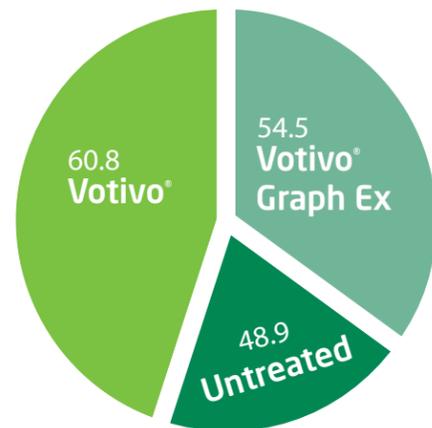
CROP NUTRITION:
20-60-120 suspension Applied in the fall



- The A3 seed treatment plus Votivo combination provided an average of 10.8 bushels per acre over untreated soybeans.
- A3 treatments include insecticides and fungicides.
- Improved emergence, darker green color, and growth were noted at both plots.
- All treated seed had significantly reduced bean leaf beetle feeding at emergence.

VOTIVO YIELD RESPONSE

Pleasant Plains



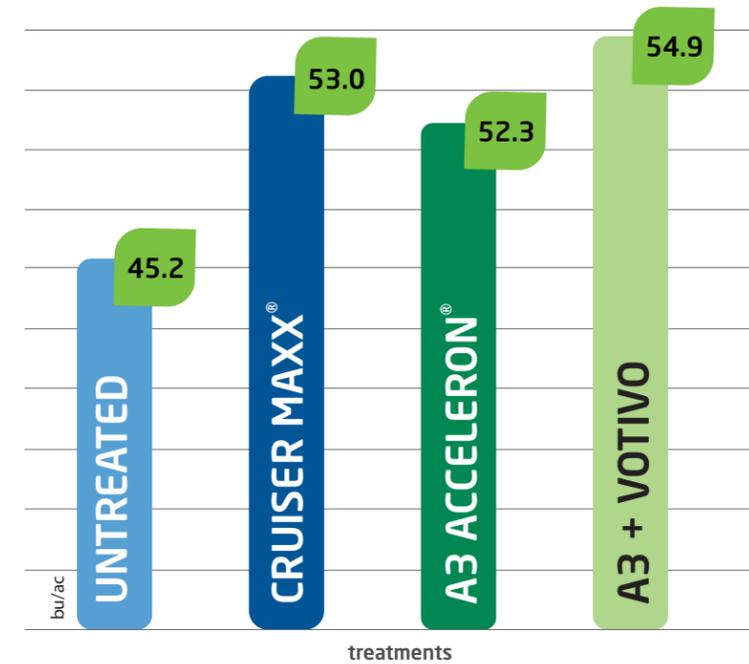
60.8
bu/ac

54.5
bu/ac

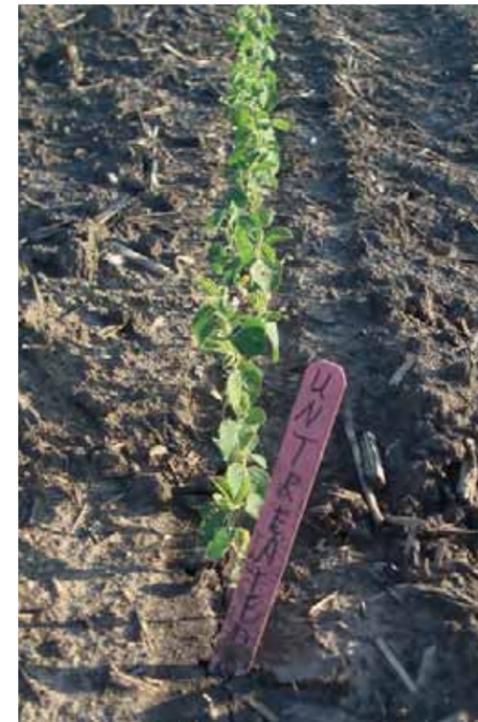
48.9
bu/ac

SEED TREATMENT YIELD RESPONSE

Lexington Plot



The home run of soybean production for both Lexington and Pleasant Plains had to be the seed treatment trials. Averaging 11 bushels per acre for a \$165 per acre value, the Votivo plus A3 treatment was head and shoulders above all other treatments. Both plots demonstrated vigorous growth and darker color from emergence to 2nd trifoliolate stage. The insecticide that is part of the treatment reduced the early season insect feeding to a near zero level. Not very often do we see an early growth stage soybean response equate to such a large harvest yield response. Start with a quality seed treatment and coordinate with a late season high management soybean protection system. This approach has maximized our yield opportunity.



FACT

Seed treatments continue to demonstrate a positive yield response.

SOYBEANS

Planting Date

CROPPING HISTORY:
Corn/Bean Rotation

TILLAGE:
Conventional tillage

PLANTING DATE:
April 23, 2012

HARVEST DATE:
September 20, 2012

HERBICIDE:
Valor 3 oz/ac

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with
1qt/ac BRANDT Smart Trio

POPULATION:
120,000

FUNGICIDE:
Quadris 6 oz/acre plus
Manni-Plex B Moly 1qt/ac,
Hero 5 oz at R3

CROP NUTRITION:
20-60-120 suspension
Applied in the fall



- April 23 was the highest yielding planting date.
- Foliar insect pressure on the earlier planting dates reduced yields.

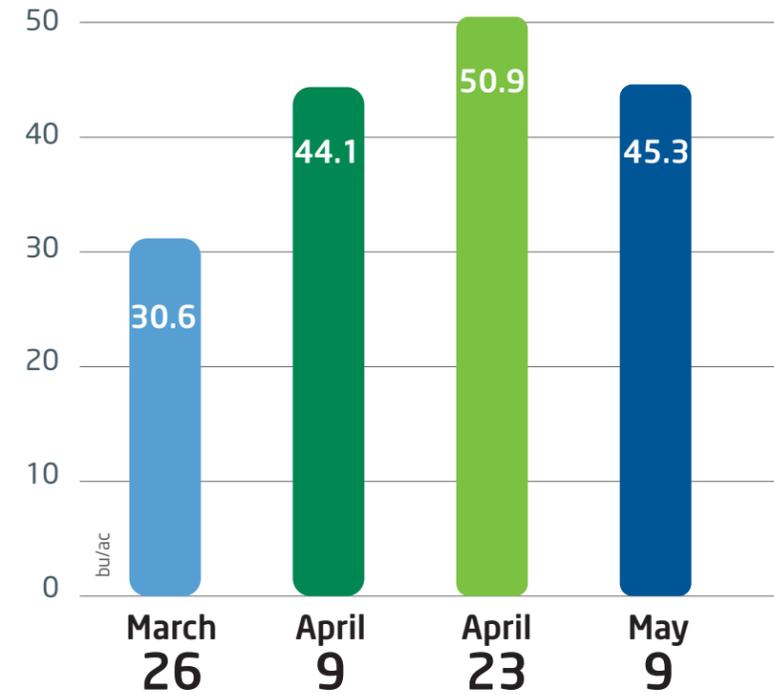
April 23 was the highest yielding planting date for the 2012 trials. The soybean planting date trials stimulated a number of challenges and opportunities. The first challenge was to escape the early frosts of the March planted soybeans, which we did with flying colors. March planted beans began flowering and hit R1 stage a full month ahead of the summer solstice of June 20 (typical first flower date of non determinate soybean varieties). As soon as the March beans began to flower, we observed heavy Japanese beetle leaf feeding (*right to the row*). Ed Corrigan summarizes, "Opting to not apply insecticide at this time,

- Late August rains improved yields on late planted soybeans.
- May 9 planting date had the least amount of green stems and leaves at harvest.

I am sure the early planted beans took a big yield hit from these scavengers. The last stress of the early planted soybeans was the short stature of plants that were in 30-inch rows. This wider row width and short plant height did not allow the middle of the rows to shade the ground, increasing the soil temperature. We also observed that later planting dates were consistently taller as planting was delayed. Along with those later plantings they had noticeably less insect pressure from Japanese beetles and spider mites. Finally, we speculate the late August rains were also a salvation for the last plantings."

PLANTING DATE TRIALS

2012 Pleasant Plains



PECULIAR

One peculiar observation was that the latest planted soybeans had the brownest stems at harvest. Even though these were the brownest stems with no leaves left on them, they were the hardest for the combine to harvest.

Population

CROPPING HISTORY:
Corn/Bean Rotation

TILLAGE:
Conventional tillage

PLANTING DATE:
April 23, 2012

HARVEST DATE:
September 20, 2012

HERBICIDE:
Valor 3 oz/ac

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with 1qt/ac
BRANDT Smart Trio

POPULATION:
120,000 / 140,000 / 160,000

FUNGICIDE:
Quadris 6 oz/acre plus
Manni-Plex B Moly 1qt/ac,
Hero 5 oz at R3

CROP NUTRITION:
20-60-120 suspension
Applied in the fall

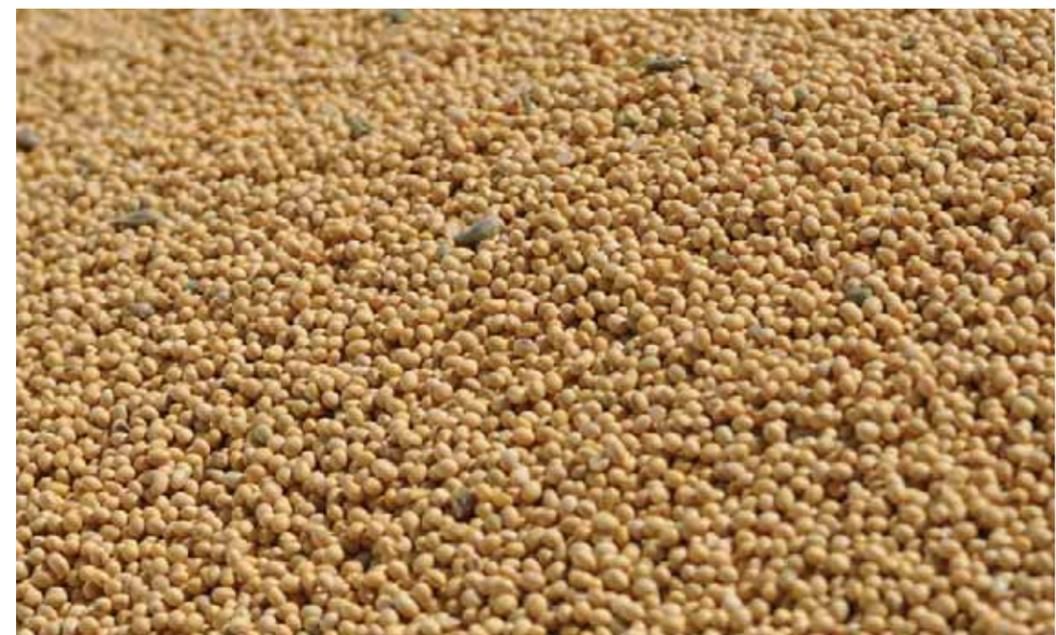
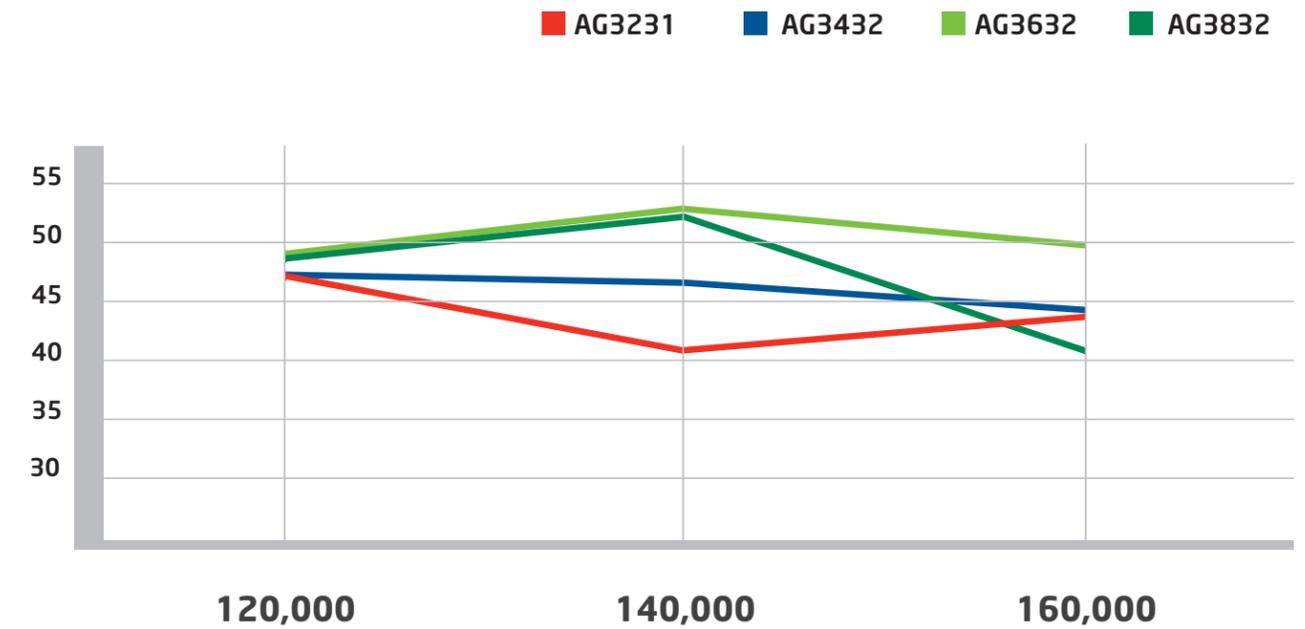


- 140,000 was the highest yielding population in three out of four varieties.
- Three years of population trials indicate higher yields at 140,000 or less when planted early (*prior to May 1*).

The 140,000 population continued to be the highest yielding average. Variety response was similar to the last three years of population trials. The earlier maturing varieties responded best to lower populations and longer maturing varieties yielded greatest at 140,000 population. All populations maintained good standability with no observed variance of disease or insect pressure.

PLANTING POPULATION TRIALS

2012 Pleasant Plains



FACT

Plant population responses follow planting date

Maturity and Variety Response

CROPPING HISTORY:
Corn/Bean Rotation

TILLAGE:
Conventional tillage

PLANTING DATE:
April 23, 2012

HARVEST DATE:
September 20, 2012

HERBICIDE:
Valor 3 oz/ac

POST HERBICIDE:
32 oz of Roundup
WeatherMAX with
1 qt/ac BRANDT Smart Trio

POPULATION:
120,000

FUNGICIDE:
Quadris 6 oz/ acre plus
Manni-Plex B Moly 1qt/ac,
Hero 5 oz at R3

CROP NUTRITION:
20-60-120 suspension
Applied in the fall



- Longer maturing beans added 10 bushels per acre over shorter maturity varieties.
- Grain moisture percentage did not follow the maturity of the variety.
- The RR2Y trait averaged 4.3 bushels per acre more than the straight RR trait.

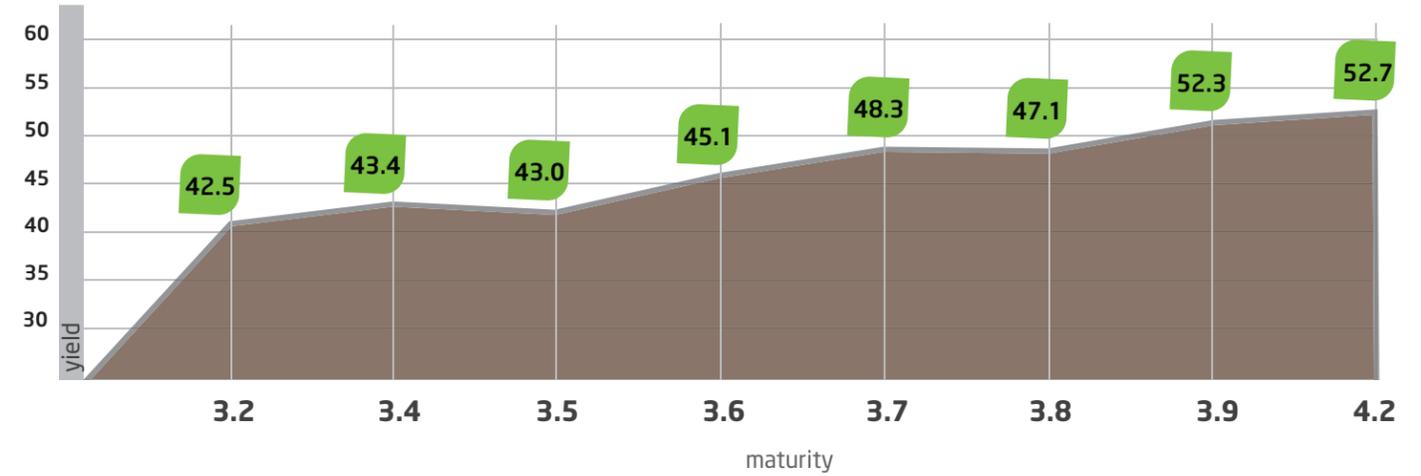
Picking a longer maturity variety for your zone added an average of 10 bushels per acre (\$160/ac value). All the varieties were very similar. The grain moisture at harvest had no relationship to maturity this year. For the third year in a row, we observed a higher yield for RR2Y beans vs straight RR varieties.

FACT

Later maturing soybeans lead the way

SOYBEAN MATURITY

Yield vs Maturity

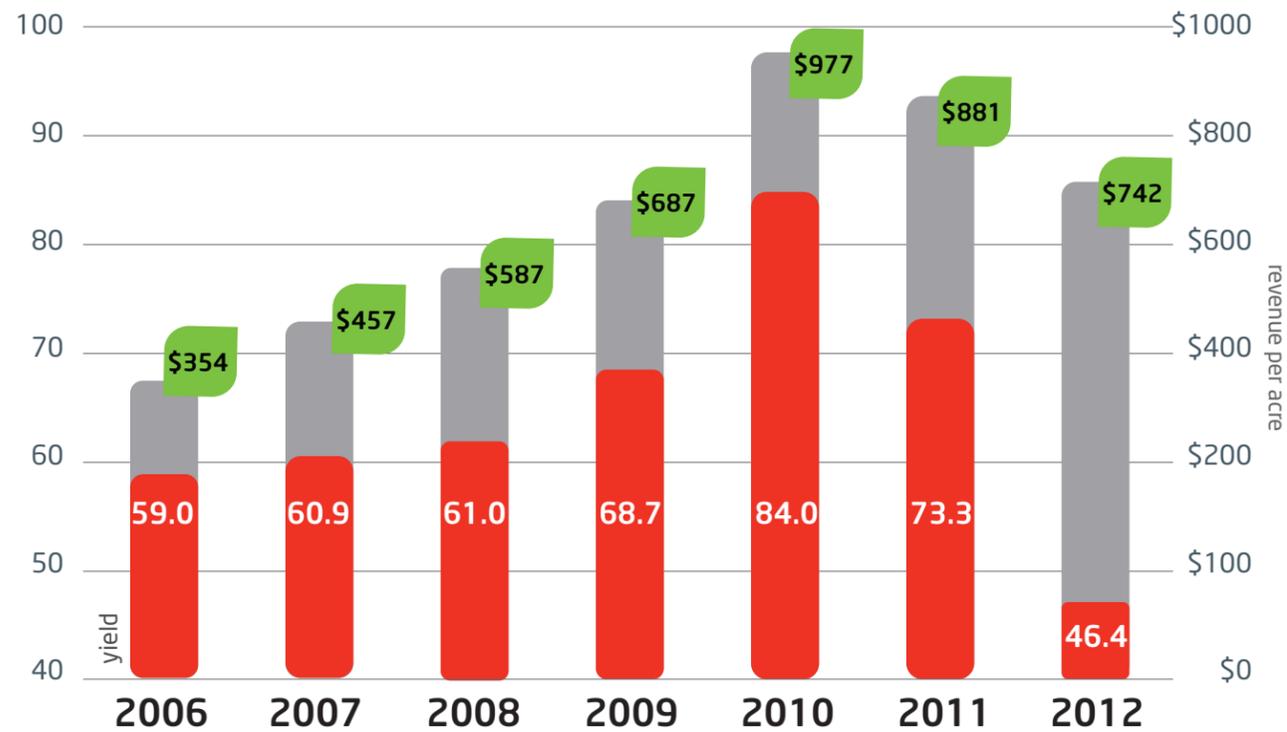


VARIETY RESPONSE TO CROP ROTATION AND POPULATION

BRAND	VARIETY	TRAITS	MATURITY	HARVEST MOISTURE	AVERAGE YIELD @ 13% MOISTURE	AVERAGE GROSS INCOME @ \$16.00/BU
Asgrow	AG3231	RR2Y	3.2	11.8	42.5	\$680.26
Asgrow	AG3432	RR2Y	3.4	12.2	45.5	\$728.54
Asgrow	AG3533	RR2Y	3.5	10.9	43.0	\$688.39
Asgrow	AG3731	RR2Y	3.7	10.8	46.2	\$738.54
Asgrow	AG3832	RR2Y	3.8	11.2	46.8	\$748.71
Asgrow	AG4232	RR2Y	4.2	11.6	52.7	\$843.38
Pioneer	93Y40	RR	3.4	11.9	38.1	\$609.69
Pioneer	93Y82	RR	3.8	10.7	47.4	\$757.95
Croplan	R2C 3632	RR2Y	3.6	11.0	45.1	\$721.16
Croplan	R2C 3780	RR2Y	3.7	10.7	50.4	\$805.61
NK	S34-N3	RR2Y	3.4	11.7	46.7	\$747.94
NK	S39-U2	RR2Y	3.9	11.5	52.3	\$836.20
Total Average				11.3	46.4	\$742.20

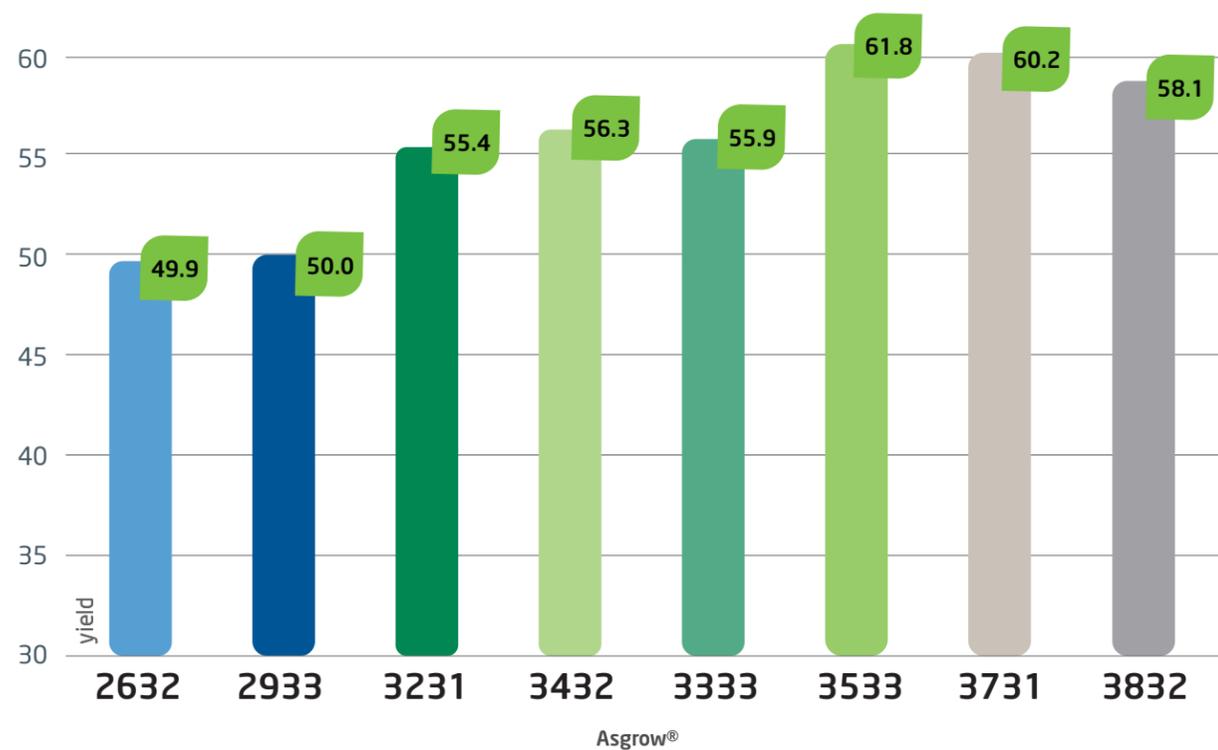
7-YEAR SOYBEAN VARIETY PLOT AVERAGES

Yield vs Gross \$/ac



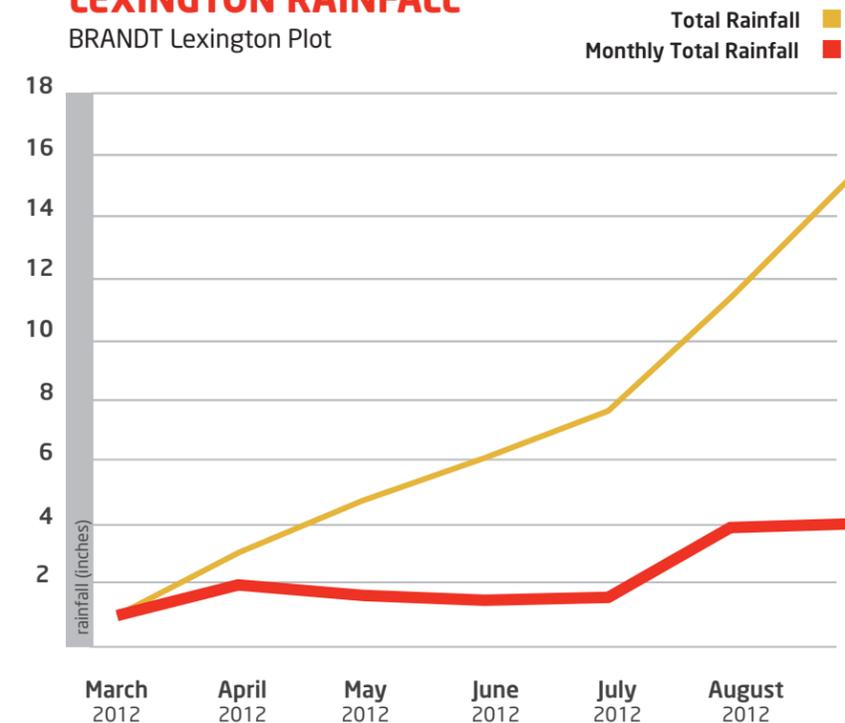
SOYBEAN VARIETY AND MATURITY

BRANDT Lexington Plot



LEXINGTON RAINFALL

BRANDT Lexington Plot



Rainfall at our Lexington plot totaled 15.5 inches for the growing period of March through August. The rainfall, at just under 2 inches per month from April to July, was insufficient for high yield corn production. The record high temperatures and lack of rainfall coupled with insect pressure resulted in poor pollination and ear molds. The insects fed heavily on silks and opened the husks allowing the disease to begin. Soybean production was more normal due to good rains in August.

FACT

Seed treatments increase yield on early planted soybeans.

Pipeline Research

CROPPING HISTORY:
1st year corn on beans

TILLAGE:
Strip tillage

PLANTING DATE:
April 9, 2012

HARVEST DATE:
August 29, 2012

HERBICIDE:
2.7 qt Degree XTRA pre-emerge

POST HERBICIDE:
32 oz of Roundup WeatherMAX with 1 qt/ac BRANDT Smart Trio

POPULATION:
39,000

FUNGICIDE:
Quilt Xcel 14 oz/acre plus N-Boron 1qt/ac Hero 5 oz at R2

CROP NUTRITION:
240-90-180 (30-90-180 fall applied suspension, 180 units of ammonia with N-Serve, 30 units of 28% at plant).

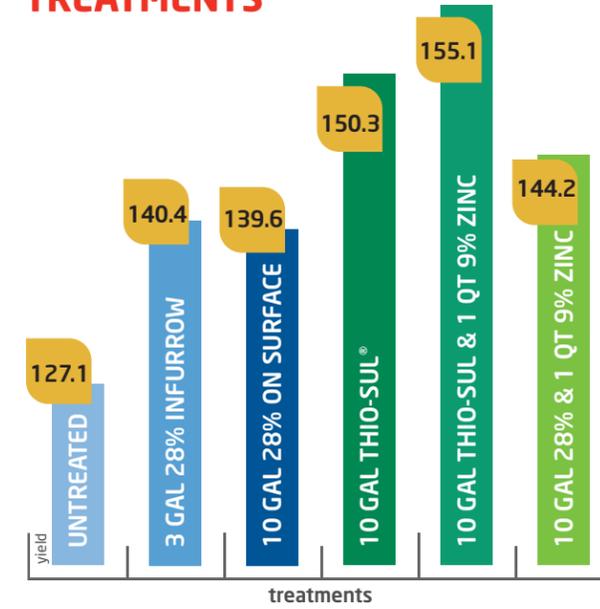


BRANDT expanded the Pleasant Plains trials in 2012 by adding a field just north of the new Specialty Formulations production facility. "Pipeline" trials are focused on evaluating proprietary BRANDT products, experimental

products, and production practices that will improve grower yield and profits. As a leading manufacturer of foliar nutritionals, these trials will assist BRANDT with product development for the future.

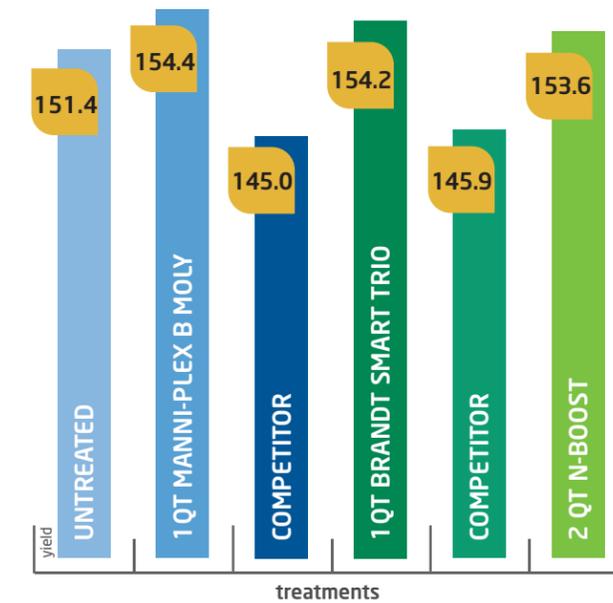
- Sulfur treatments at planting time had a good yield response.
- All "at plant" zinc treatments increased yield.
- Soil insecticides consistently demonstrated a yield increase.
- N-Boron and N Boost both improved yields at tassel time treatments.
- V5 treatment winners were BRANDT Smart Trio, Manni-Plex B Moly and N Boost.

RESPONSE TO PLANTER STARTER TREATMENTS



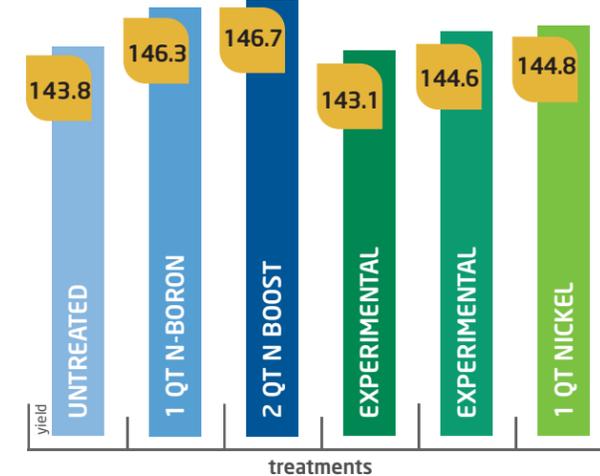
All starter treatments had a positive yield response this year. The addition of 9% zinc to each treatment gave the leading yield response of each trial. Starter was applied in two different methods. A3 gal per acre rate was applied in the furrow with the seed. The 10 gallon per acre rate of 28% and treatments were banded on the surface over the top of the row. Treatments had a measurable response above the 28% and will be tested further in 2013. Sulfur deficiencies have been identified in grower fields the last couple of years. Sulfur is a very leachable element that must be applied close to planting time to maximize yield response.

V5 TREATMENT



The V5 treatments were applied one week after the post Roundup application with water as the only carrier. Manni-Plex B Moly, N Boost, and BRANDT Smart Trio provided very similar yield results with the two competitive products reducing yields below the untreated check. A slight "greening" effect was observed 4 to 10 days after treatment with the N Boost and BRANDT Smart Trio. No visual effect was noted on other treatments.

AT TASSEL



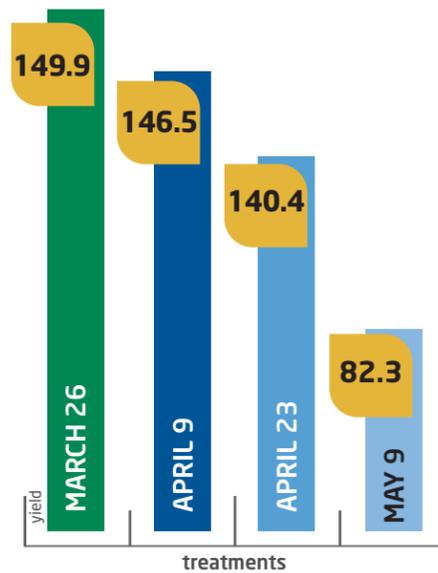
A positive yield response was measured on the N-Boron and N Boost applications at the tassel stage. N-Boron has been responsible for yield increases ranging from 2.5 to 7 bushels per acre at the Pleasant Plains plots over the last 7 years. Applications of insecticide and or strobilurin fungicide at tassel stage provide a good opportunity to include N-Boron to assist pollination and improve nitrogen efficiency.

N Boost has been used in many other countries and is a new product to the U.S. market for 2012. It stimulates the plant to increase the amount of carbon within each cell thus improving nitrogen efficiency and yield. Expanded trials are planned for 2013.

The nickel and two experimental treatments did not provide a meaningful yield response in this year's corn tassel trials.

CORN PLANTING DATE TRIALS

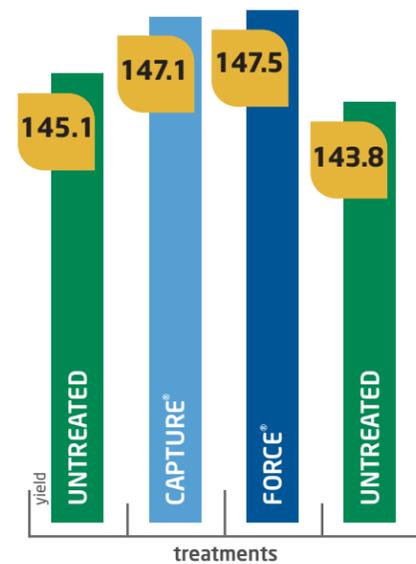
2012



The corn planting date trials were the hottest conversation of the 2012 trials for BRANDT. Each growth stage and weather event provided some very visual and exciting observations that could not have been enhanced. The dry conditions this spring allowed for very timely planting of each of the four dates and the yield curve is exactly what would have been expected. Our only “do over”, if we had one, would be that we would have included a trial of corn on corn to compare to the corn on bean rotation used here. When planting conditions are good, early planting pays off! Enough said!

SOIL INSECTICIDE TRIAL

Planter insecticide on Triple Pro Hybrid



The soil insecticide yield response was very uniform and much smaller in a corn on bean rotation than the trial used the last couple of years in corn on corn Total Acre. Both products provided enough yield increase to pay for the treatment in a very low rootworm pressure environment. As insect pressures increased, we would anticipate additional yield response.



FACT
N Boost is the one to watch.

Summary

The BRANDT Research and Development Farm is focused on constructing trials that evaluate yield responses to a mixture of traits and products as they are influenced by various management practices. These are practices that each grower can easily adopt to his/her own farm to achieve higher yields and more profit. Many of the trials use an “Omission” plot design to evaluate the yield response of each practice. The trial design begins by incorporating all management practices that optimize yield and plant health. Next, each of the practices chosen for a yield response is removed (one at a time) or the rate adjusted. This allows us to measure the degree of yield loss from the omission or reduction of a practice.

Central Illinois began this year with unseasonably warm conditions and unusually dry soils, creating a supreme seedbed for optimal seed soil contact. This was a welcome change from the last two years of abundant rainfall in central Illinois (over 50 inches) that created poor field conditions for planting. Record high temperatures were recorded throughout the month of March and into April allowing tillage and planting to progress two to three weeks earlier than normal. By May, growing conditions were so good many growers admitted this year’s “potential crop” was the best the area had ever encountered. In June, corn and soybean trials began displaying moisture stress and crop yield potential dropped each day as the drought built. Insects began to emerge and multiply, creating additional trauma to the plants and further reducing yield expectations. The growing crop, at this point, began to reflect the various manage-

ment practices used such as applied fertility insecticide, crop rotation, planting date, hybrid, and maturity. As the graphs on pages 7 and 32 demonstrate, the overall hybrid and variety trials of 2012 averaged just half the yield per acre of 2010 crop yields.

The drought environment created many “teachable moments” in 2012. This was definitely the year that a small change in management reflected very visual crop stress, but also meant significant dollars per acre for each bushel not lost to that stress. The longer maturity hybrids and varieties that were planted in April were one of the first to optimize yield. We observed that hybrids that rolled their leaves and flowered early significantly out yielding other hybrids by conserving precious water. The addition of phosphate and potash initiated earlier tasseling and provided improved yields over trials where we omitted phosphate and potash. Higher corn populations and narrowed row widths not only created more shade from the short stature corn: it also resulted in improving yields of most hybrids. **(Note: this year’s 20 inch row planter created a significant amount of side wall compaction, therefore compromising this study.)** Applying foliar insecticides during early flower development of both corn and soybeans contributed significantly to overall plant health and yield. Minimizing stress from post herbicides, insect damage and drought through the addition of micronutrients to the spray solution produced a home run.

Ed Corrigan, Technical Agronomist
Pat Schaddel, Technical Support Manager

BRANDT Consolidated, Inc.

2935 South Koke Mill Road
Springfield, Illinois 62711 USA
www.brandt.co
217 547 5800

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