Corn Max Inputs Trial

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Objective

The objective of this study was to evaluate corn yield benefit from combinations of three different variables: seeding rate, nitrogen rate, and fungicide application.

Background

Crop Year:	2008	Herbicide:	
Cooperator:	Farm Focus/Marsh Foundation	PRE(May 24):	Cinch ATZ at 1.75 qt/A + Durango at 1.5 qt/A +2,4-D LVE6 at 10 oz/A + AMS at 17 lb/100 gal
County/Town:	Van Wert/Van Wert		
Soil Type:	Hoytville silty clay loam, Haskins loam	Hybrid:	Stewart 7T765
Drainage:	Tile- nonsystematic	Insecticide:	Poncho 250 on seed
Previous Crop:	Wheat	Row width:	30 inches
Tillage:	Fall disk/ripper, land leveled. No spring tillage.	Planting Rate:	see Methods
Soil Test (2005):	pH 6.2, P 38 ppm, K 118 ppm	Planting Date:	May 23, 2008
Fertilizer:	225 lb/A 2-9-49 broadcast incorporated (Aug. 2007); 95 lb/A 45-0-0 2x2 banded at planting; 135 or 195 lbs/A nitrogen sidedressed as 28% UAN (June 18)	Harvest Date:	October 20, 2008

Methods

This study was set up as six treatments with four replications of each treatment in a randomized complete block design. Plot size was 60 feet wide by 600 feet long. The treatments were:

1) 30,000 seeds/A, 180 lbs/A nitrogen, with 6 oz/A Headline fungicide + 0.25% v/v NIS
2) 40,000 seeds/A, 180 lbs/A nitrogen, with 6 oz/A Headline fungicide + 0.25% v/v NIS
3) 30,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide
4) 40,000 seeds/A, 240 lbs/A nitrogen, with 6 oz/A Headline fungicide + 0.25% v/v NIS
5) 40,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide
6) 30,000 seeds/A, 180 lbs/A nitrogen, no foliar fungicide

Headline foliar fungicide treatments were applied on August 8 at corn stage R2-blister. Fungicide applications were made with a high clearance ground sprayer in 15 gallons per acre spray volume at 40 psi using TeeJet XR11004 flat fan nozzles on 15 inch spacing.

Harvest populations (October 10, 13) were estimated by counting the number of plants with harvestable ears on each side of a 17 feet 5 inch measured distance at four different locations in each plot. The average of the number of plants per 17 feet 5 inches was converted to plants per acre. Yields were calculated from grain weights measured with a calibrated weigh wagon from

the entire 60 feet wide plot (24 rows). Plot moistures were measured with the yield monitor. All yields were adjusted to 15% moisture.

Results

Table 1. Harvest population, moisture, and yield means[1] for each treatment.

Treatment	Harvest Population	Moisture	Yield
	(plants/A)	(%)	(bu/A)
30,000 seeds/A, 180 lbs/A nitrogen, Headline foliar fungicide	30,600 b	19.4	195.7 a
40,000 seeds/A, 180 lbs/A nitrogen, Headline foliar fungicide	39,100 a	18.4	183.3 b
30,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide	30,400 b	19.2	203.3 a
40,000 seeds/A, 240 lbs/A nitrogen, Headline foliar fungicide	39,200 a	19.5	186.1 b
40,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide	39,200 a	18.6	187.2 b
30,000 seeds/A, 180 lbs/A nitrogen, no foliar fungicide	30,100 b	19.1	185.5 b
LSD (P=0.05)	1,700	NS	7.9
F-test	69.7	1.0	8.6
CV (%)	3.3	4.4	2.8

[1] Means followed by the same letter in the same column are not significantly different.
NS= not significant

Summary

The results from this one year study did show statistically significant differences in harvest population and yield for the treatments. Significant differences in harvest populations were expected as a result of setting the planter for two different seeding rates. The addition of 60 lbs/A nitrogen caused a significant yield advantage when comparing the treatment consisting of 30,000 seeds/A + 180 lbs/A nitrogen and the treatment consisting of 30,000 seeds/A + 240 lbs/A, with neither treatment receiving fungicide. Also, the addition of Headline foliar fungicide caused a significant yield advantage when comparing the treatment consisting of 30,000 seeds/A + 180 lbs/A + Headline and the treatment consisting of the same seeding rate and nitrogen rate without the addition of Headline fungicide. There is no clear reason why the additional nitrogen or fungicide applications did not cause a significant yield response at the higher seeding rates.

For economic comparison, we compiled seed cost, nitrogen cost and fungicide cost below:

Treatment	Input cost[1]	Gross Revenue[2]	Net Revenue[3]
	($/A)	($/A)	($/A)
30,000 seeds/A, 180 lbs/A nitrogen, Headline foliar fungicide	225	685	460
40,000 seeds/A, 180 lbs/A nitrogen, Headline foliar fungicide	250	642	392
30,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide	248	712	464
40,000 seeds/A, 240 lbs/A nitrogen, Headline foliar fungicide	293	651	359
40,000 seeds/A, 240 lbs/A nitrogen, no foliar fungicide	273	655	382
30,000 seeds/A, 180 lbs/A nitrogen, no foliar fungicide	205	649	445

[1]Input cost for seed, nitrogen, and fungicide only
[2]Corn bushel price of $3.50
[3]Net revenue figures taking into account input costs of seed, nitrogen, and fungicide only- not all input costs

For the above economic comparison we used in season product costs for the Headline foliar fungicide treatment of $14.00/A plus the cost of application ($6/A) for a total cost of $20.00/A. Using a current corn market price of $3.50/bushel, this would require an additional 5.7 bushel/A yield increase in corn yield to break even. The addition of 60 lbs/A nitrogen would require a corn yield increase of 12.3 bushel/A to break even. Likewise, the use of a 40,000 seed/A seeding rate compared to a 30,000 seed/A seeding rate would require a 7.1 bushel/A yield increase in corn to break even. The nitrogen price ($0.72/lb) and seed price ($2.50/1000) are from the 2009 Corn Enterprise Budgets compiled by OSU Production Business Management Specialist Barry Ward (http://aede.osu.edu/programs/FarmManagement/budgets/).

The application equipment used to apply the Headline foliar fungicide caused some wheel track damage to the corn plants within those treatment plots. Analysis of the data from the inside 12 rows harvested with the wheel tracks did not appear different to the data from the outside 12 rows harvested outside of the wheel track damage.

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