



Trial: 2007-Headline Corn

## **The effect of Headline® fungicide on the yield of four corn hybrids.**

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### **Summary**

Headline fungicide was applied at the Tassel (VT) stage of four corn hybrids (Croplan 491 YGCB, Croplan 421 YGCB, Pioneer 37F74 HX and Pioneer38H64 HX). The crop was under drought stress in July and early August. Low disease pressure was observed during the period of the trial. A slight delay in maturity was observed with Headline treatment. Yield differences between hybrids were observed. Across and hybrids fungicide increased corn yields. A probable interaction between fungicide application and yield by hybrid was observed.

### **Background & Objective**

The strobilurin fungicide, Headline®, has recently been labeled for use on field corn. This is the second year of a study examining the effect of prophylactic foliar fungicides on yield of several corn hybrids under SW Minnesota growing conditions.

### **Site and application description**

The trial was planted at the University of Minnesota, Southwest Research and Outreach Center near Lamberton, Redwood County, Minnesota. Site and treatment application details are shown in table 1 and 2 respectively. The Bt corn borer hybrids Croplan 491, Croplan 421, Pioneer 37F74 and Pioneer 38H64 were planted in a split plot design with six replications on May 3, 2007. Main plots were fungicide treated or untreated and subplots were hybrid. Plots were planted with a John Deere Max Emerge planter at 2 inch depth. The previous crop was soybean. Force 3G insecticide at 5 oz. /1000 ft row was applied in a T-band for corn rootworm management based on a history of extended diapause northern corn rootworm. Early season rainfall was above average. Post emerge herbicide could not be applied to two of the six replication as a result of wet soils and the few weeds in these plots were hand weeded. The latter part of the season was extremely hot and dry from mid-June until mid-August. Detailed temperature and rainfall information for this trial can be found at:

<http://swroc.coafes.umn.edu/Weather/weather.htm>.

This trial was effectively free of foliar disease at the time of fungicide application to Full tassel corn on July 13. Headline fungicide @ 6 oz/acre with 0.125% V/V NIS were applied in 20 gallons per acre water at 38 PSI pressure using a Hi Boy Sprayer (Hagie Manufacturing Company).

**Table 1. Location and agronomic information**

<b>Site information</b>						
<b>Location:</b>	University of Minnesota Southwest Research and Outreach Center					Series H4-6
<b>County:</b>	Redwood	<b>Nearest Town:</b>	Lamberton, MN			
<b>Soil type:</b>	Normania and Ves Loams					
<b>Fertility:</b>	<b>P(Bray):</b> 12	<b>K:</b> 140	<b>pH:</b> 6.1	<b>O.M. %</b> 0.0		
<b>Applied Fertilizer:</b>	November 15, 2005 135-0-0					
<b>Plot design:</b>	Split plot 6 replications where main plot = fungicide treatment and subplot = variety					
<b>Plot size:</b>	10 foot x 65 foot					
<b>Plot Maintenance</b>						
<b>Previous crop:</b>	Soybean					
<b>Primary Tillage:</b>	Fall 2006 Mulch Till					
<b>Secondary Tillage:</b>	4/30/2007 Field cultivator 1X					
<b>Planting date:</b>	5/3/2007	<b>Row spacing:</b>	30 inch			
<b>Seeding rate:</b>	34,000	<b>Seeding depth:</b>	2.0 inches			
<b>Planting equipment:</b>	John Deere MaxEmerge					
<b>Cultivar:</b>	Part of trial	<b>Trait(s):</b>				
<b>Weed control:</b>	PPI 1X 04/30/2007	Harness 2.25 pt				
	POST 06/05/2007	Buctril & Atrazine 2 pint	Repl. 1,2,5,6 only			
<b>Disease control:</b>	Part of trial					
<b>Insect Control:</b>	Force 5 oz T band at planting					

**Table 2. Treatment application information**

<b>Date:</b>	7/13/2007
<b>Wind:</b>	Calm
<b>Temperature (F):</b>	66 F
<b>Relative humidity %</b>	60%
<b>Crop stage:</b>	VT-R1
<b>Volume:</b>	20GPA
<b>Pressure:</b>	38 PSI
<b>Nozzle:</b>	8003
<b>Nozzle spacing:</b>	15"
<b>Equipment:</b>	Hagie Hi Boy

**Results and discussion**

Plant injury was not observed with any of the treatments. Low disease pressure continued until maturity for all varieties and quantifiable differences by fungicide treatment were not observed. Common corn rust, northern corn leaf blight and gray leaf spot were observed at trace levels but occurred late in the growing season. Isolated plants with anthracnose symptoms were observed. Senescence was delayed about one week in plots receiving fungicide.

The factorial analysis of variance (ANOVA) for Soybean yield and moistures are shown in table 3. Due to the significance of replication for yield, pooled error was not used to calculate mean separations.

Hybrids differed in moisture at harvest at maturity (Table 3). Croplan 421 had lower yield than other varieties. Croplan 491 and Pioneer 38H64 had the lowest yield (Table

3, Figure 1). Yields were good in spite of the droughty conditions from late vegetative to early dough stages.

A difference in moisture by fungicide treatment was significant at the 10% but not at the 5% level (Table 3). With three of the four hybrids, a numerical yield advantage for fungicide was observed and a numerical yield decrease was observed with Croplan 491. A fungicide by hybrid interaction for yield was significant at the 10 % but not 5% level (Table 3, Figure 2). At the 10% level, fungicide application increased yield on two of the four hybrids Pioneer 37F74 and Pioneer 38H64, 10.6 bushels and 13.8 bushels respectively. Fungicide application did not increase yield on Croplan 421 and Croplan 491. Across hybrids fungicide treated plots yielded 6.9 bushels more than untreated. Gray leaf spot, common rust and other disease ratings scored by company range from slightly below to slightly above average in the hybrids tested.

This trial showed yield response for prophylactic fungicide application. However, it is likely that there is an interaction with fungicide response and hybrid (Prob (F) = 0.054). A hybrid interaction would make predictability of a response difficult. These results are dissimilar to the results obtained in 2006 where yield differences were not observed under a higher yield environment

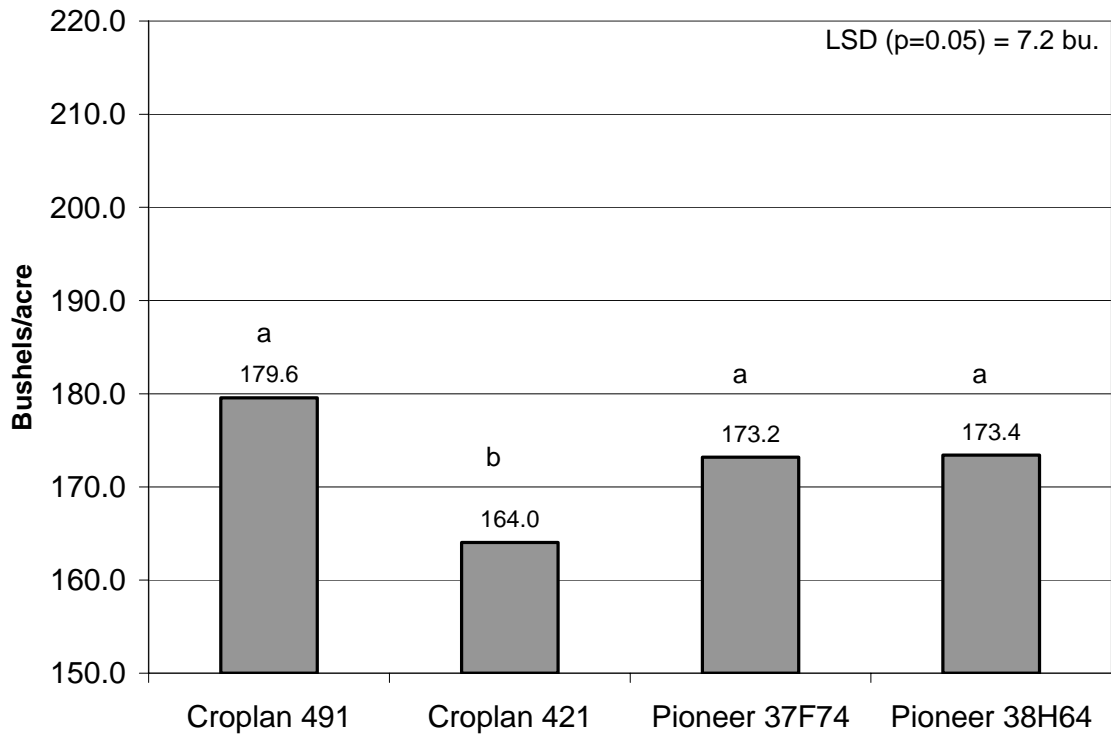
<http://swroc.cfans.umn.edu/SWMNPEST/06publications/headlinecorn.pdf> .

Scouting for early season corn disease combined with awareness of weather forecasts and disease tolerance of hybrids may eventually allow better prediction of economic responses to fungicide applications to field corn.

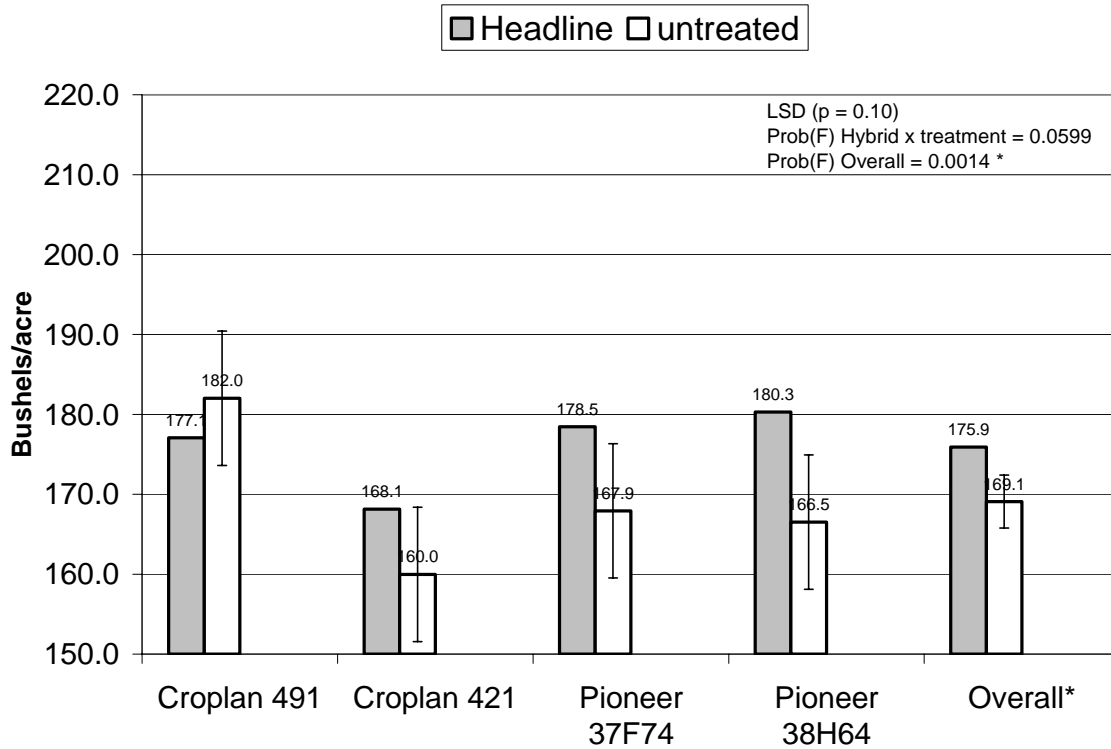
**Table 3.** Factorial analysis of variance (ANOVA). The effect of foliar applied fungicides on corn moisture and yield. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2007)  
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Character Rated	% moisture	Prob (F)	LSD (0.05)	yield BU/acre @15.5% 10/10/2007	Prob (F)	LSD (0.05)
Rating Date	10/10/2006					
<b>TABLE OF R MEANS</b>		0.2907	<b>N.S.</b>		0.001	<b>8.76</b>
Replicate 1	13.2 a			160.2 b		
Replicate 2	13.0 a			167.9 b		
Replicate 3	13.1 a			175.9 ab		
Replicate 4	13.2 a			177.0 a		
Replicate 5	13.0 a			178.8 a		
Replicate 6	12.9 a			175.6 a		
<b>TABLE OF A MEANS</b>		0.054	<b>N.S.</b>		0.0086	<b>4.23</b>
1 Headline	13.2			176.0 a		
2 Untreated	13.0			169.1 b		
<b>TABLE OF B MEANS</b>		0.0001	0.25		0.0014	<b>7.15</b>
1 Croplan 491	12.8 c			179.6 a		
2 Croplan 421	12.4 d			164.0 b		
3 Pioneer 37F74	13.3 b			173.2 a		
4 Pioneer 38H64	13.8 a			173.4 a		
<b>TABLE OF AB MEANS</b>		0.1791	<b>N.S.</b>		0.0599	<b>N.S.</b>
1 Headline	12.8			177.1		
1 Croplan 491						
2 Untreated	12.8			182.0		
1 Croplan 491						
1 Headline	12.4			168.1		
2 Croplan 421						
2 Untreated	12.4			160.0		
2 Croplan 421						
1 Headline	13.4			178.5		
3 Pioneer 37F74						
2 Untreated	13.2			167.9		
3 Pioneer 37F74						
1 Headline	14.0			180.3		
4 Pioneer 38H64						
2 Untreated	13.5			166.5		
4 Pioneer 38H64						

Figure 1. Yield comparison for four hybrids with and without fungicide. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2007) B. Potter



**Figure 2.** The effect of Headline fungicide on the yield four corn hybrids.  
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**Acknowledgments:**

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