

## Impact of Foliar Fungicides on Corn Hybrids

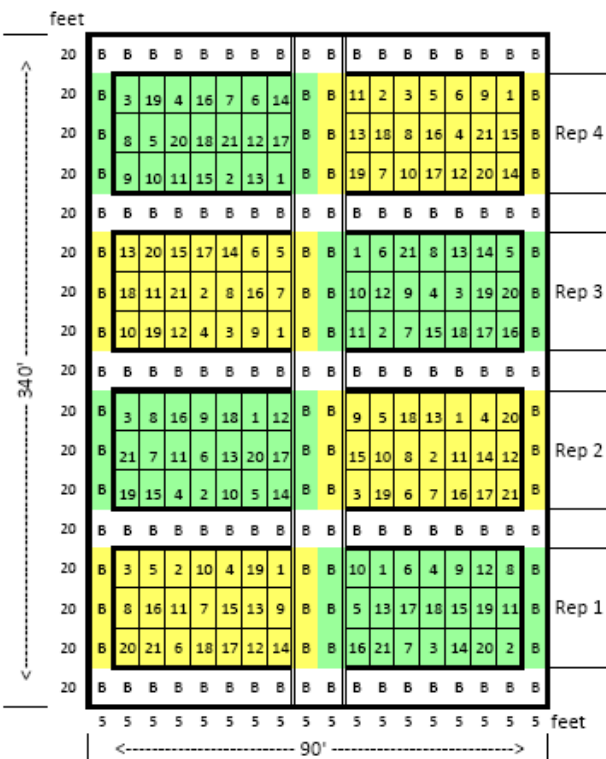
### Purpose:

The use of fungicides, particularly strobilurin fungicides, has been promoted for their disease control and yield enhancing effects on corn, soybeans and other crops. In many incidences, producers can expect economic yield responses from these products when diseases are present but the data is still inconsistent when it comes to plant health claims. The interactions among foliar fungicides and corn hybrids are not well understood; they most likely play a critical role in yield responses. In order to answer this question, a multi-year study was started in 2008.

### Methods:

The trials were conducted at three locations in southwestern Ontario (Ridgetown, Exeter and Wingham) during the 2008 and 2009 growing seasons. At each location, 21 commercial corn hybrids appropriate for that location were selected and planted. The 21 hybrids at each location were treated with or without the foliar fungicide Headline (BASF) at the tassel stage (T1) for a total of 168 plots per location. Headline application was done with the high clearance John Deere Field Research Sprayer maintained by the University of Guelph Ridgetown Campus. Headline was selected in this trial since much of the data generated in Ontario and the US has been associated with this product plus space and resources were limited. Plots were allowed to be naturally infected and disease ratings were recorded pre and post fungicide application.

Figure 1: Plot Layout

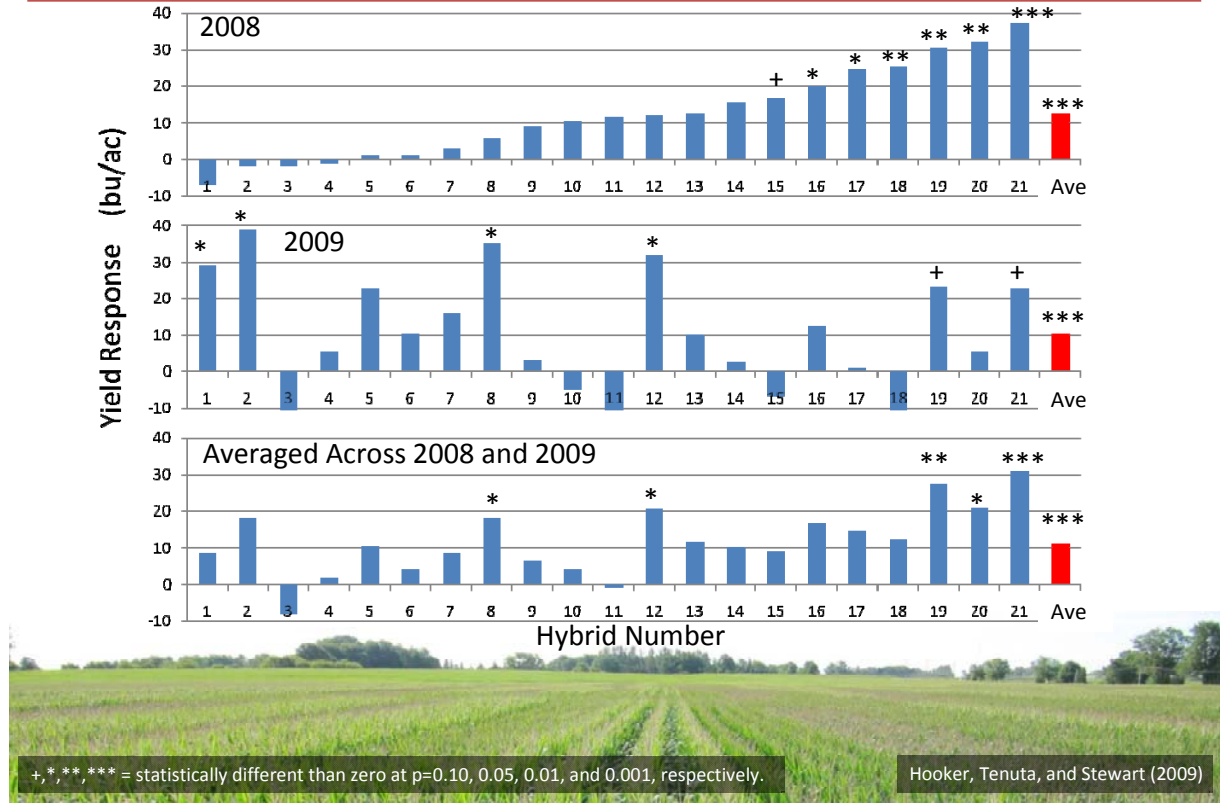


\* YELLOW = NO FUNGICIDE  
GREEN = HEADLINE

### Results:

As expected fungicide responses varied by hybrid, location and year. Although the average yield response at all three locations (Ridgetown, Exeter and Wingham) was significant ( $p < 0.05$ ) over the two years, the response was less during the 2009 growing season than in 2008. The relationship between fungicide yield response and the yield potential of the hybrid and/or the hybrids susceptibility to leaf diseases needs to be examined further in this study. In other studies, the economic response to fungicides was highest in hybrids which lack a good disease package.

Figure 2 - Fungicide response varied by hybrid and year  
-- RIDGETOWN --

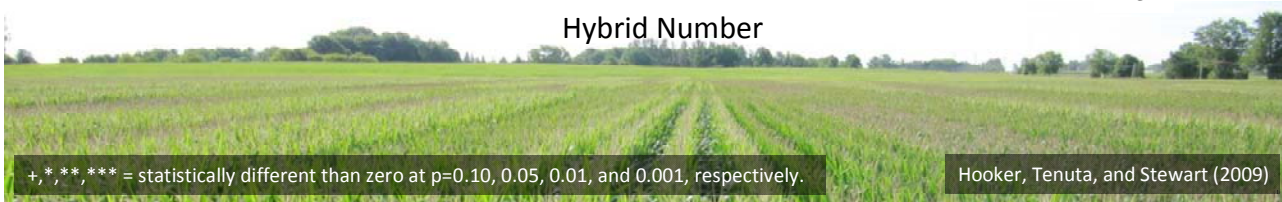
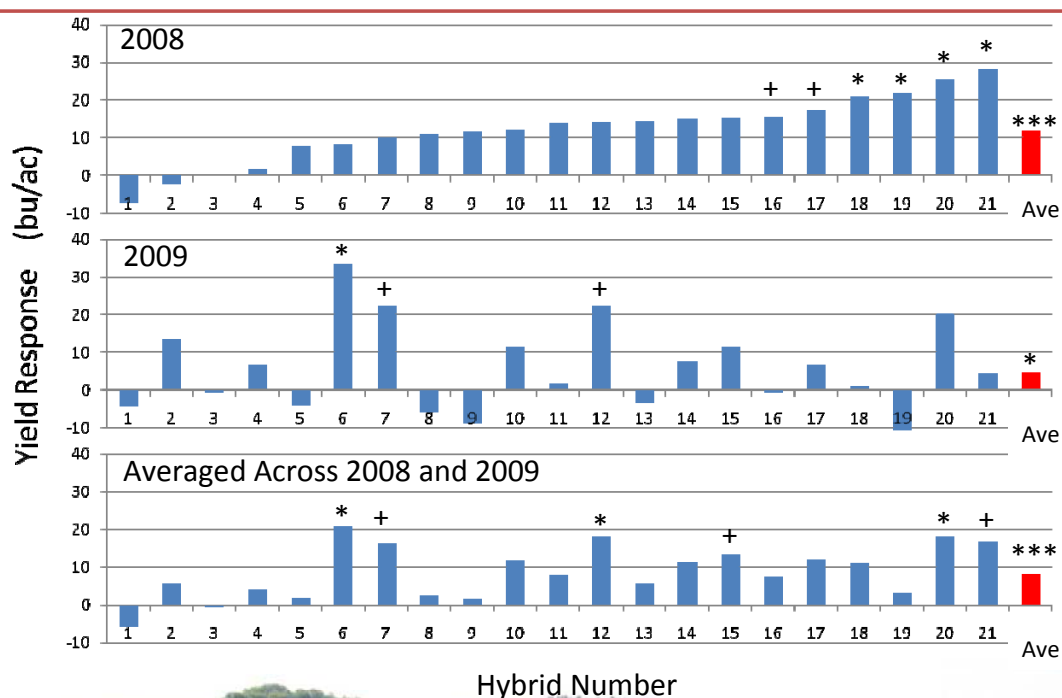


**Summary:**

There were significant differences in how hybrids responded to Headline in both years but this yield response is often variable and a number of factors can contribute to this variability. Some of these factors include environmental conditions, which diseases are present and are they controlled or suppressed, is it a hybrid physiological responses as opposed to disease management or combination of both, etc. From this study we have seen some consistent genetic responses but we are currently investigation why some hybrids respond more than others.

Figure 3 - Fungicide response varied with hybrid and year

-- EXETER --



+, \*\*, \*\*\* = statistically different than zero at p=0.10, 0.05, 0.01, and 0.001, respectively.

Hooker, Tenuta, and Stewart (2009)

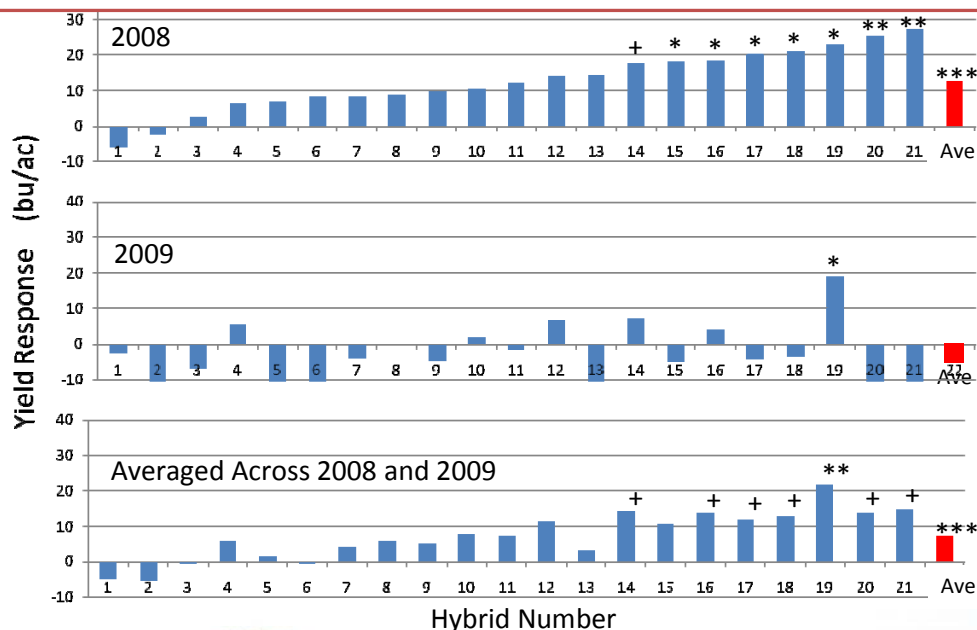
**Next Steps:**

As previously described, this is a multi-year project. The effects of hybrid in the absence of foliar diseases needs to be further studied since we do not have a full understanding of the interactions occurring. Which hybrids respond and which don't to a fungicide application? Can we make this response consistent across environments (locations)? For this reason we have initiated another study with the Seed Corn Growers of Ontario and the seed corn companies to look at inbred responses to foliar fungicides with the ultimate goal of determining whether a hybrid response could be used in a predictive model to assist producers in their decision whether or not to apply a fungicide.

**Acknowledgements:**

Funding for this project was provided in part by Agriculture and Agri-Food Canada through the Agricultural Adaptation Council's CanAdvance Program, the Ontario Corn Producers Association, various seed corn companies who graciously provided seed and BASF Canada for also providing the fungicide.

Figure 4 - Fungicide response varied with hybrid and year  
-- WINGHAM --



+ , \* , \*\* , \*\*\* = statistically different than zero at p=0.10, 0.05, 0.01, and 0.001, respectively.

Hooker, Tenuta, and Stewart (2009)

**Project Contacts:**

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**Location of Project Final Report:**

Please visit the GoCorn.net or the GFO website.