2011
Wisconsin On-Farm Foliar Fungicide Trials for Corn Grain

All information regarding on-farm trials is available at:
http://fyi.uwex.edu/fieldcroppathology/onfarm_trials/

Objective: To determine the economical use and timing of foliar fungicides in corn grown for grain in Wisconsin using the standard production practices of individual growers.

In 2011, we currently have funding to offer honorariums for five corn fungicide trials. The honorarium for growers is $200, for consultants it is $150, and for applicators it is $100. All paid participants will need to fill out a W9 tax form, which will be provided at a later date. For your convenience, a sample formatted invoice form will also be provided.

Materials and Methods:

Experiment Design: *Trials may be conducted using small plot (4 rows x 50 ft) or large* on-farm strip trials, which are sized to fit within a grower's production field. All trials must be conducted using a randomized complete block design. ***The minimum number of replications per trial site is three, although four is preferred. All treatments must be randomized within each replication.***

Treatment List: There is a new treatment list for 2011. With an increase in the number of questions about the use of early foliar fungicide applications (approximately V5 to V6), we want to compare single fungicide application applied at V5 or at R1. An untreated check must also be one of the treatments.

Therefore, the treatments are:

1. Untreated Check
2. Fungicide applied only at V5
3. Fungicide applied only at R1

To create a randomization for a RCBD in Excel:
1. In a blank worksheet
a. Enter plot numbers in column A
b. Enter treatment names in column B
c. Enter "=rand()" in column C (copy and paste)
2. Select columns B and C
3. Select "Data>Sort", then sort by "Column C"
a. Treatments are now randomly assigned to plots
b. Values in column C will change, but you can ignore this
c. The process works because "=rand()" generates random numbers from a uniform distribution

Hybrid and Other Production Practices: Because we are interested in how a fungicide responds under growing conditions that growers would experience, hybrids used in an individual trial are selected by the grower. Other production practices, including plant population, tillage, herbicide application, etc., are to be selected by the grower. Production information is to be recorded (on accompanying data sheets) for our records and analyses. Please select fields, or area of fields, which are as uniform in soil type and geography as possible. This helps to reduce potential variability in harvest data.

Application Techniques: **Applications must be made according to the current recommendations for each product**. Product and rates will be provided to each cooperator in advanced of the application. Please note that the application rate for the V5 application may be different from that for the R1 application. In 2011, all trials should be conducted using ground application methods. Our recommended good fungicide techniques are to use a medium droplet size, 15-20 GPA (ground application), and 35-40 PSI. Adjuvants can be used with either application timing but please consult with us regarding the best recommendation if they are to be used.

Disease Assessments Requirements:

V5 Disease Assessment (Pre-Application assessment)
R1 Disease Assessment (Pre-Application assessment)
Pre-Harvest Disease assessment
Stalk Nudge Test
Tassel Dieback Assessment
Stalk Health Assessment

Three foliar disease ratings must be completed. The first rating should be completed prior to the V5 fungicide application and the second rating prior to the R1 application and the third in early September prior to senescence. List all foliar diseases present and estimate the percentage of diseased (blighted) foliage for each treatment in each replication. For the V5 rating, estimate severity on the whole plant. For the R1 and pre-senescence ratings estimate the disease severity at the ear zone and above. If you cannot differentiate the severity of individual diseases, assess disease severity as the total "blighted" area. Please make special note if disease pressure is not even throughout the plot area. Please also note if there are other issues with production like insect damage, fertility imbalance, etc. Additionally, for the September disease assessment, a rating for number of tassels that show symptoms of premature death (assess 30 plants) should be obtained. For all disease assessments, ratings should not start on field edges, rather ratings should be conducted by walking into each plot approximately 50 yards before starting the data collection process. To help guide foliar disease assessments, standard area diagrams are available for the following diseases: (i) Common rust; (ii) Eyespot; (iii) Gray leaf spot; (iv) Northern corn leaf blight; (v) Northern corn leaf spot. These can be obtained from the Field Crops Plant Pathology website: http://fyi.uwex.edu/fieldcroppathology/onfarm_trials/.

Stalk Rot Assessments: **Incidence and severity of stalk rot must be obtained for each plot.** Stalk rot data should be collected at black layer (maturity). For incidence data, use the stalk nudge test. In this test, record the number of lodged plants per 30 consecutive plants in each treatment. A plant is considered lodged if it bends prior to reaching a 45-degree angle or if the stalk is lodged prior to this test.

For severity, we will make assessments on 5 plants per plot that are not in the harvested section of the field. For this, arbitrarily select five plants and split the stalk from the base. We will use the "University of Illinois (0-5) Stalk Rot Rating Scale" of Hines, Shaw, and White. A description of the rating system is provided below and copies are available at: http://fyi.uwex.edu/fieldcroppathology/files/2011/03/stalkrotscale.pdf.

"University of Illinois (0-5) Stalk Rot Rating Scale".

Rating Description
0 = No visible discoloration of the internal tissue below ear stalk nodes or pith
1 = Internal discoloration at the stalk nodes below the ear
2 = Internal discoloration at the stalk nodes and in the pitch below the ear
3 = Pith separation occurring below the ear
4 = Complete discoloration and decay of the pith between at least two nodes below the ear, but stalk still standing
5 = Stalk lodged below the ear due to stalk rot

Yield: Yield measurements should be obtained for each individual plot by harvesting from the middle of each plot, away from borders. Please make a note of the harvest length. Also please obtain grain moisture and test weight (if possible) data on a plot basis.

Data Analyses: Two sets of statistical analyses will be conducted. An initial analysis will be conducted for an individual trial site to test the hypothesis that responses like disease severity and/or yield are not affected by the application of a foliar fungicide. This information will be provided back to individual growers who participate in the trial and will also be used for summary extension documentation. For the second analysis, a combined statewide analysis will be conducted that examines the effect of variation across trial locations. All analyses will be conducted with SAS software, using the MIXED procedure. The alpha level will be set to 0.10 for all analyses and LSD will be used when there is a significant difference found.