# PLANTING DATE AND INSECTICIDE USAGE FOR PREVENTION OF BARLEY YELLOW DWARF IN KENTUCKY GROWN WINTER WHEAT (2000-2001)

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## METHODS:

Clark wheat was planted using a no-till planter on 4, 16, or 30 Oct 2000 following a corn crop on the University of Kentucky Research and Education Center in Caldwell Co. KY. The 7' by 15' plots were arranged in a randomized block design generated by Proc Plan (SAS 1998) with 4 replications.

Fertility was applied as 35 lbs of nitrogen on 13 Feb 01 and 70 lbs of nitrogen on 23 Feb 01. Harmony Extra ® herbicide was applied on 13 March 01 at a rate of 0.5 fl. oz. per acre. The fungicide Tilt ® was applied at a rate of 4 fl. oz /Ac on 26 Apr 01.

The insecticide treatments included three different application dates; 27 Nov 00 (Fall), 07 Mar 01 (Winter) or 01 May 01 (Spring), and all possible combinations of these dates and a no insecticide control, applied to all planting dates. This provides for eight separate insecticide treatments on each planting date as follows:

1.) Non-Treated
2.) Fall Only (11/27/00)
3.) Winter Only (3/7/01)
4.) Fall & Winter
5.) Spring (5/1/01)
6.) Fall & Spring
7.) Winter & Spring
8.) Fall & Winter & Spring

Each insecticide application consisted of Warrior ® (lambda-cyhalothrin) at 3.2 fl. oz. per acre, made with a backpack sprayer in 26 gal of spray per acre.

Regular aphid counts were not made but plots were checked for aphids just before applications were made. Plots were rated for BYD on 30 Apr. 01 (ca. Feekes GS 10) by randomly selecting 50 individual plants and examining them for symptoms. A percent infection based on plants displaying BYD symptoms was calculated for each plot.

Plots were harvested in June 2001 using a small plot combine. Harvested grain was weighed, and checked for moisture content. Plot grain weights were corrected to a moisture standard of 13.5% and yields per acre were calculated based on a standard 60 lbs. per bushel.

All data was analyzed using SAS, Proc GLM.

**RESULTS AND DISCUSSION:**

Originally the experiment was designed to have four planting dates. These dates would reflect planting too early, on time and too late for this location. However, the fourth planting date was not made as the ground was frozen by the target date.

In order to reduce variability in the experiment, fertility, herbicides, and fungicide were applied regardless of need and at high rates. Reducing variation, as much a possible, increases one's ability to explain differences or lack thereof, on the experimental variables, in this case planting date and insecticide timing. These applications however are not necessarily economically appropriate treatments and are not intended as production recommendations.

Plots showed too few symptoms of BYD for analysis. Only a rare strike could be seen and thus is not expected to account for much if any differences in the yield data. One should bear in mind however that not all losses are accompanied by visual symptoms, just as visual symptoms are not always accompanied by yield reductions.

The overall analysis of yield data for the experiment did produce a significant difference (F=4.74). However, all of this difference was due to Planting Date (Table 1). The analysis for planting date provided a significant difference (F=46.52), while the analysis for Insecticide Sprays (F=1.35) and the Planting Date X Insecticide Spray interaction (F=0.47), were not significant.

**Table 1. Yield of plots of Clark wheat planted on three different planting dates.**

| REGWQ* Grouping | Mean (Bu/Ac) | N | Planting Date |
|---|---|---|---|
| A | 89.770 | 32 | 3 |
| B | 83.951 | 31 | 2 |
| C | 76.191 | 30 | 1 |

*Means with the same letter are not significantly different. Ryan-Einot-Gabriel-Welsch Multiple Range Test at p=.05 level of significance.

Though sprays did not provide significant differences in the original analysis, an overview of the data suggested something might be present. Therefore the data for sprays was separated and analyzed for each planting date. These three separate analyses used Proc GLM for the analysis of variance and the Dunnett's test to look at each insecticide treatment (Table 2). Dunnett's is a very powerful test, which compares each treatment individually to a standard, in this case the untreated check. In every comparison no significant difference was found. In essence thought there appear to be some differences in the data, in this year on this set of plots every plot (within a planting date) was essentially equal. None of the insecticide applications produced a difference in yield.

**Table 2. Yield (Bu/Ac) for plots of Clark wheat planted on three dates and treated with insecticide on various dates*.**

| Treatment | Planting Date 1 | Planting Date 2 | Planting Date 3 |
|---|---|---|---|
| No Insecticide | 74.2 | 80.3 | 87.0 |
| Fall Only | 72.0 | 85.9 | 88.9 |
| Winter Only | 80.1 | 83.8 | 88.4 |
| Fall & Winter | 73.7 | 83.0 | 90.4 |
| Spring Only | 75.0 | 81.7 | 90.8 |
| Fall & Spring | 75.9 | 85.5 | 89.7 |
| Winter & Spring | 77.8 | 84.3 | 91.1 |
| Fall, Winter & Spring | 81.6 | 87.7 | 91.9 |

*Means within a column followed by *** are significantly different from the No Insecticide treatment. Dunnett's Comparison at p=.05 level of significance.

Because yields did not show a response to any insecticide treatments, in this experiment all insecticide applications would have given a negative return on dollars invested. This is consistent with the lack of BYD symptoms found in the study.

The reason(s) for a difference in yields based on planting date is not clear. That the second planting date is higher yielding than the first is not unreasonable as that date is near what is considered optimum for this location. However, one might have expected that the final planting date would result in a decreased yield as compared to the second date. One might conjecture that as the fall of 2000 was quite mild, the third planting date had an equally good chance of producing an adequate stand, as did the second. Additionally, perhaps the third planting was not as far advanced (growth stage) ending the winter and was thus provided some protection from late winter or early spring freeze injury.

## REFERENCES:

SAS. 1998. The SAS System for Windows 6.03. SAS Institute Inc, Cary, NC

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