# Proline® and Folicur Fungicide on Spring Wheat - 2008

## Purpose:

To evaluate the impact on yield and grain quality of Proline® and Folicur® fungicides on spring wheat.

## Methods:

Project co-operators were asked to apply either/or both Proline® and Folicur® fungicides in a block in a field planted to a single wheat variety. The fungicide was applied within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.

For proper spray coverage, Backward-Forward Nozzles or Turbo FloodJets alternating along boom were to be used. The 2 nozzle configurations were to be at 30 cm (12") above canopy. Backward-Fwd nozzles were to be at 15 degrees from horizontal. See Picture 1 below.

At Harvest, weights and grain samples were taken from both sides of the treated and untreated blocks

## Results:

**Figure 1 – Daily Rainfall for 2007 and 2008 Growing Season from the Ottawa Weather Station.**

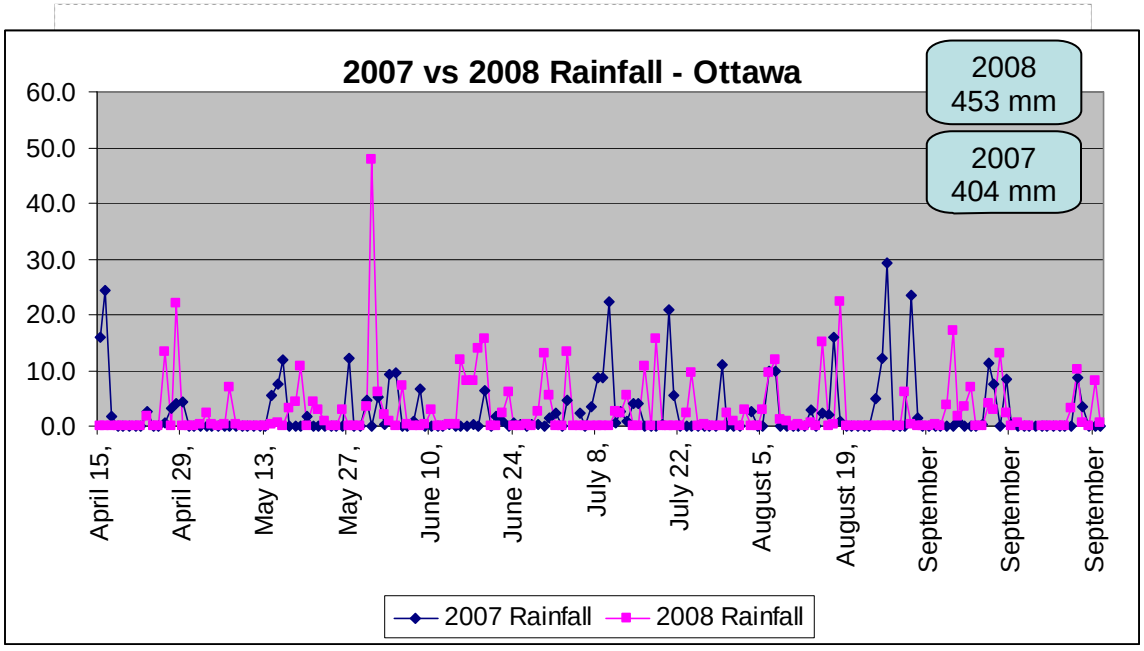
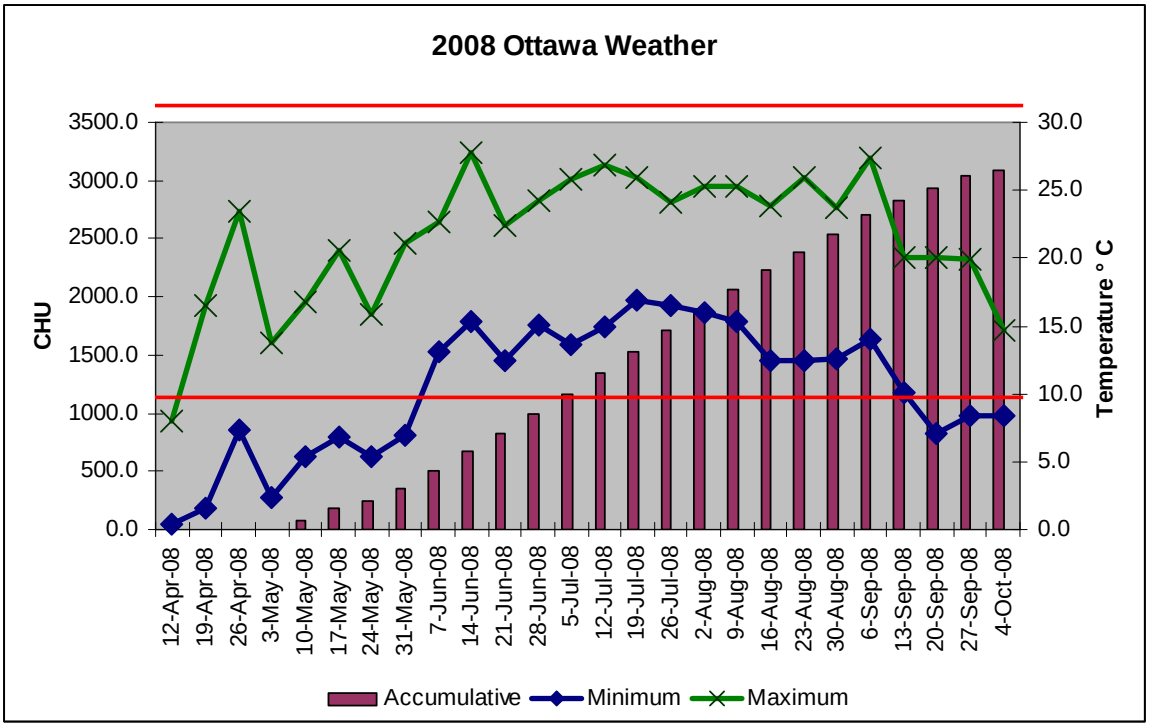


**Figure 2 – Daily High and Low Temperatures collected at the Ottawa Weather Station 2008.**




The weather data shown in Figures 1 and 2 from the Ottawa Weather Station represents the daily rainfall and the high and low weekly temperatures experienced during the 2008 growing season. Fusarium Head Blight requires both moisture and that temperatures are between 10° and 32° to survive and grow. From Figure 1, note that although the total rainfall during the growing season was only 59 mm or about 15% more in 2008 than 2007, the number and frequency of rainfall events was much greater. The temperatures range is indicated by the two horizontal lines on Figure 2. The critical wheat growth stage for infection is 5 to 7 days prior and up to 11 days following the head emerged stage. For most of the spring wheat crop this occurred between June 21$^{st}$ to July 12$^{th}$. In 2008, both moisture and temperatures were ideal for fusarium infection during this critical wheat growth stage, thus resulting in extremely high levels of Fusarium Damaged Kernels (FDK %) and vomintoxin (VOM ppm) which is produced by the fusarium mould.

For proper spray coverage, the Backward-Forward Nozzles or Turbo FloodJets alternating along boom are required. The 2 nozzle configurations are to be 30 cm (12”) above canopy and Backward-Fwd nozzles should be 15 degrees from horizontal (see Picture 1). The twin jet nozzles (Picture 2) give less coverage of fungicide product on the head of the wheat where the protection against the fusarium infection occurs, than the Turbo FloodJet.

**Table 1 - Folicur® compared to Untreated**

| Variety | Nozzle Type Used | Yield @14.5 % (bu/ac) | FDK (%) | VOM (ppm) 6 = >6 | DIFF Yield @14.5% (bu/ac) | % DIFF Fusarium | % DIFF VOM | Grade |
|---|---|---|---|---|---|---|---|---|
| Sable | Twin | 55.4 | 4.26 | 4.89 | 0.5 | -75.9% | -18.5% | CE Feed |
| Sable | Twin | 66.1 | 19.46 | 6 | 3.4 | 53.6% | 0.0% | Sample |
| Brio | Twin | 43.9 | 22.1 | 6 | -3.4 | 62.4% | 0.0% | Sample |
| Sable | Twin | 59.2 | 8.16 | 6 | 0.1 | -52.8% | 0.0% | Sample |
| Sable | Flat Fan | 58.6 | 11.14 | 5.62 | 4.8 | 77.1% | -6.3% | Sample |
| Sable | Flat Fan | 60.2 | 20.18 | 6 | 6.5 | * | 0.0% | Sample |
| Sable | Twin | 65.1 | 9.88 | 6 | 1.6 | | | Sample |
| Sable | Twin | 66.4 | 9.64 | 6 | 2.9 | | | Sample |
| Sable | 2-nozzle | 32.5 | 8.2 | 6 | 0.6 | -62.5% | 0.0% | TF Sample |
| Sable | 2-nozzle | 32.2 | 9.69 | 6 | 1.5 | 3.0% | 0.0% | TF Sample |
| **Avg.** | | **54.0** | **12.3** | **5.9** | **1.9** | **0.7%** | **- 3.1%** | |

**Picture 1 – Turbo FloodJet nozzles**


**Picture 2 – Twin Jet nozzles**

## Summary:

Table 1 shows the 2008 result of Folicur® compared to Untreated strips and Table 2 shows the results of Proline® compared to Untreated strips. It is important to note that in most of these strips that incorrect nozzles were used and therefore may explain why there was less of a FDK ie. Fusarium % and VOM reduction than would have been expected from these on-farm field verification trials as compared to the research trials. The poor reduction in FDK and DON in these results emphasizes the importance of using the proper nozzles when applying these fungicide products. Graph 1 shows the Nozzle Affects DON (VOM) Reduction in Winter Wheat research conducted by Dr. Dave Hooker at Ridgetown Campus - University of Guelph. This research also shows the impact of the nozzles.

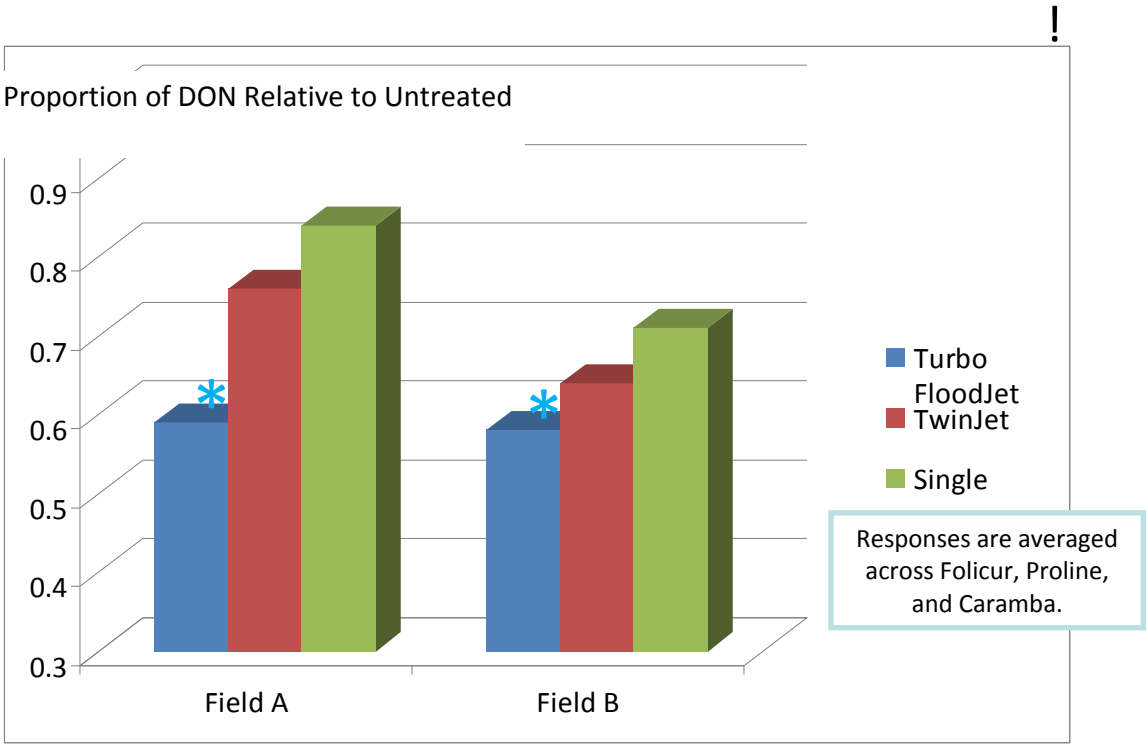
**Table 2 – Proline® Compared to Untreated.**

| Variety | Nozzle Type Used | Compare to | Yield @14.5% (bu/ac) | FDK (%) | VOM (ppm) | Dockage (%) | DIFF Yield @14.5% (bu/ac) | % DIFF Fus | % DIFF VOM | Grade |
|---|---|---|---|---|---|---|---|---|---|---|
| Sable | Flat Fan | Untreated | 67.6 | 21.6 | 6 | 0.1 | 5.0 | 10.8% | 0.0% | TF Sample |
| Sable | Flat Fan | Untreated | 61.7 | 4.16 | 3.74 | 0.1 | 3.6 | -49.0% | -7.7% | TF CE Sample |
| Sable | 2-nozzle | Untreated | 77.1 | 4.03 | | 0 | 18.0 | -74.4% | | CE Feed |
| Sable | 2-nozzle | Untreated | 74.8 | | | | 15.2 | | | |
| Sable | 2-nozzle | Untreated | 50.6 | 4.44 | 2.66 | 0.3 | | | | CE FEED |
| Norwell | Flat Fan | Untreated | 54.1 | 6.42 | 2.87 | 0.9 | 2.7 | -56.1% | -47.4% | Sample |
| Norwell | Flat Fan | Untreated | 48.5 | 7.63 | 5.02 | 1.2 | 1.1 | -41.3% | 2.0% | Sample |
| Norwell | Flat Fan | Untreated | 51.3 | 5.94 | 4.33 | 1.2 | 5.9 | -53.1% | -19.8% | Sample |
| Sable | Twin | Untreated | 72.9 | 11.94 | 6 | 0.7 | 6.9 | 12.3% | 0.0% | Sample |
| Sable | Twin | Untreated | 70.8 | 12.13 | 6 | 0.6 | 8.2 | 0.1% | 0.0% | Sample |
| Sable | Flat Fan | Untreated | 64.9 | 6.99 | 6 | 0.2 | 11.2 | 11.1% | 0.0% | Sample |
| **Avg.** | | | **62.9** | **8.2** | **4.8** | **0.5** | **7.8** | **-26.7%** | **-10.0%** | |

From the 2008 data, Folicur® (Table 1) on average resulted in only 1.9 bushels per acre (bu/ac) which in most cases isn't enough extra yield to offset the yield loss due to trampling. Also there was no reduction in fusarium or VOM as compared to the untreated samples. Previous on-farm project results have shown about a 1/3 reduction in FDK and VOM levels with the use of Folicur®. Table 2 shows an average 7.8 bu/ac yield increase with the use of Proline®, 26% reduction in FDK and a 10% reduction in VOM. 2007 results with the use of Proline® showed 4.5 bu/ac increase. The greater reduction in FDKs and VOM levels with Proline® compared to Folicur® is consistent with the small plot research findings.

The cost of product and application of Folicur® is about $25.00 per acre and about $35.00 for Proline®. With most 90 foot boom sprayers, trampling is about 2.6%. On a 65 bu/ac crop this equals about 1.7 bu/ac. At $7.00 per bushel spring wheat, the trampling costs add close to $12 per acre. Trampling loss can be significantly reduced with the use of tramlines, or in the case of Folicur if it is aerial applied.

**Figure 3. – Nozzle Affects DON Reduction in Winter Wheat**




Mean DON in untreated Field A = 4.0 ppm; sprayed @ Day +6
Mean DON in untreated Field B = 3.8 ppm; sprayed @ Day +2 (Hooker et al., 2008)
* = significantly different than average of TwinJet and single nozzles

## Next Steps:

The intent is to run the project for a third year in 2009 and final report to be written.

## Acknowledgements:

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## Location of Project Final Report: