

Cereal Leaf Disease Management with Headline, Tilt and Folicur Fungicides in Spring Cereals

FINAL REPORT 2006

Purpose:

To evaluate the effectiveness of HEADLINE fungicide and compare the Cereal Leaf Disease Control of HEADLINE, TILT, and FOLICUR with a non-treated strip. HEADLINE is a new fungicide for the control of leaf diseases in cereal crops. HEADLINE has the same window of application as TILT. Company literature promotes that there is a greater yield advantage for HEADLINE as compared to TILT. HEADLINE is not the same product as FOLICUR, although, some growers found that FOLICUR gave some control of late diseases and yield increases. HEADLINE should be applied by the flag leaf stage. This product can be applied, with a later application of Folicur to reduce Fusarium Head Blight.

Methods:

HEADLINE and TILT were applied on the cereal crop immediately after flag leaf emergence in strips, leaving a non-treated (check) strip for comparison. For 2005, HEADLINE was also applied earlier than the flag-leaf stage with the herbicide by some cooperators. This is referred to as "HEADLINE EARLY" for comparison. In 2006, BASF promoted the use of ½ rate (80 ml per acre) with the herbicide to be followed by FOLICUR was applied at the 75% head emerged stage of the spring wheat. In all plots, FOLICUR was applied at the 75% head emerged stage of the spring wheat. Strips of each treatment were harvested.

Results:

The results for the fungicide treatments in 2004, 2005 and 2006 are shown in the tables on the pages 2 to 5.

Fungicides on Oats showed no yield advantage and little improvement in Test Weight in 2004 (Table 1). Headline is not registered for use on oats, but was under a special research permit for this plot. Unfortunately there was not any comparison on oats in 2005 or 2006 to see if there was a yearly difference.

HEADLINE on barley resulted in a 3 to 5 bu/ac increase. Some barley varieties have better genetic resistance and therefore some varieties responded less than others (Table 2 & 3). At a cost of \$23.00 per acre for product and application and a \$100 per tonne for barley, the breakeven is about 10 bu/ac.

In spring wheat, the use of *HEADLINE - early* applied at the same timing as the herbicide did not show any improved yield (the negative yield response is due to field variability and lodging at this site) in 2005 (Table 5). In 2006 there was a slight yield advantage to ½ rate HEADLINE applied with the herbicide (Table 6). Because leaf diseases are rarely present at this stage of wheat plant, we would not expect and yield response from a fungicide product.

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The use of *HEADLINE* at the flag leaf emerged stage showed an economical yield advantage of 6.7 bushels per acre (bu/ac) in 2005 at Kinburn site only (Table 5). At this site there was heavy Septoria leaf disease pressure in stand at the flag leaf emerged stage of the wheat when the *HEADLINE* was applied. At other fields, there was no visible leaf disease present at the flag leaf stage of the wheat, therefore no yield improvement was expected.

In 2005 use of *FOLICUR* only showed about a 3 to 5 bu/ac increase in yield in spring wheat, with only a small advantage to including the *HEADLINE* with the herbicide. The use of *HEADLINE* with the herbicide and followed by the application of *FOLICUR* did not show an advantage as compared to the *FOLICUR* only treatment. It is interesting to note that in 2004 where *HEADLINE* was used at the flag leaf stage, there was about twice the fusarium and toxin level in the grain samples (Table 4). Although we are not sure why this is, the thinking is that *HEADLINE* controlled the other leaf diseases other than fusarium and because the fusarium mold did not have to compete with the other diseases and there was more growth of the fusarium.

Table 1: 2004 Fungicides on Oats – Strip Plots

| Cooperator: | Variety | Treatment | Moisture (%) | Test Wt. (lbs/bu) | Yield @13% (bu/ac) |
|------------------|-----------|-------------------|--------------|-------------------|--------------------|
| Munster, Ontario | AC Goslin | Headline | 14.6 | 37.0 | 90.8 |
| Munster, Ontario | AC Goslin | Headline | 14.8 | 37.0 | 96.4 |
| Munster, Ontario | AC Goslin | Headline | 17.0 | 35.4 | 91.4 |
| Munster, Ontario | AC Goslin | Headline | 14.9 | 37.6 | 90.7 |
| | | Average | 15.3 | 36.8 | 92.3 |
| Munster, Ontario | AC Goslin | Tilt | 13.9 | 37.3 | 88.4 |
| Munster, Ontario | AC Goslin | Tilt | 14.0 | 38.1 | 96.5 |
| | | Average | 14.0 | 37.7 | 92.4 |
| Munster, Ontario | AC Goslin | Non | 14.1 | 37.5 | 96.6 |
| Munster, Ontario | AC Goslin | Non | 14.1 | 37.8 | 91.8 |
| | | Average | 14.1 | 37.7 | 94.2 |
| Richmond | AC Goslin | TILT | 12.5 | 39.2 | 145.5 |
| Richmond | AC Goslin | Non | 12.0 | 37.7 | 145.3 |
| | | Difference | 0.5 | 1.4 | 0.1 |

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Table 2: 2004 Fungicides on Barley – Strip Plots

| Site Location | Variety | Type | Diff. Moisture (%) | Diff. Test Wt. (lbs/bu) | Diff. Yield @14.5% (bu/ac) | Diff. Grade No | Diff. Fusa | Diff. VOM (ppm) | Comment |
|------------------|----------------|-------|--------------------|-------------------------|----------------------------|----------------|--------------|-----------------|------------------|
| Douglas, Ontario | AC Klinck | 6-row | 0.0 | 0.1 | -1.4 | 3.0 | 3.05% | 0.00 | High VOM in both |
| Ste. Isodore | OAC Baxter | 6-row | | | | 0.0 | 0.80% | -1.70 | |
| Douglas, Ontario | AC Klinck | 6-row | 0.0 | 0.1 | 2.8 | 4.0 | 4.00% | 0.00 | High VOM in both |
| Bromley, Ontario | AC Parkhill | 2-row | 1.5 | -3.1 | 4.7 | 0.0 | 0.80% | 0.00 | High VOM in both |
| Bromley, Ontario | AC Parkhill | 2-row | -0.2 | -0.5 | 9.5 | 0.0 | 0.30% | 0.00 | High VOM in both |
| Douglas, Ontario | AC Parkhill | 2-row | 0.4 | 2.2 | 10.3 | 0.0 | -0.01% | 1.29 | |
| | Average | | | -0.21 | 5.17 | 1.17 | 1.49% | -0.07 | |

Table 3: 2006 Fungicide Barley – Strip Plots

| Variety | Treatment | Moisture (%) | Test Wt. (lbs/bu) | Yield @ 14.8% (mt/ac) | Yield @ 14.8% (bu/ac) | Average Yield @ 14.8% (bu/ac) |
|---------|----------------|--------------|-------------------|-----------------------|-----------------------|-------------------------------|
| Encore | Headline #1 | 11.3 | 42.9 | 1.6 | 73.5 | |
| Encore | Headline #2 | 11.5 | 42.3 | 1.8 | 81.0 | 77.3 |
| Encore | No Headline #1 | 11.0 | 42.5 | 1.6 | 74.0 | |
| Encore | No Headline #2 | 11.7 | 43.1 | 1.6 | 74.4 | 74.2 |

Note: HEADLINE was applied at flag emerged stage of the barley.

Table 4: 2004 Headline on Spring Wheat – Strip Plots

| Site Location | Difference Test Wt. (lbs/bu) | Difference Yield @14.5% (bu/ac) | Difference Fusarium (+ = increase, - = decrease) | Difference VOM (ppm) (+ = increase, - = decrease) |
|----------------|------------------------------|---------------------------------|--|---|
| Panmure | -0.8 | -8.4 | 178% | 196% |
| Woodlawn | -0.5 | -2.2 | | |
| Panmure | -0.6 | -1.4 | 13% | 194% |
| Vernon | -1.3 | -1.3 | | |
| Ste. Isodore | 0.0 | 0.0 | 122% | 140% |
| Vernon 2 | -1.7 | 0.7 | 105% | -97% |
| Osgoode | -0.1 | 2.1 | 78% | 440% |
| Dwyer Hill Rd | -0.5 | 2.9 | 118% | 91% |
| Vernon 3 | 0.0 | 3.0 | | |
| Kinburn | 0.0 | 3.0 | | |
| Vernon 2 | 0.6 | 3.1 | 32% | -1% |
| Kinburn | 0.0 | 3.5 | | |
| Williamstown | 0.9 | 4.5 | | |
| Dalmeny | 0.2 | 10.3 | 200% | -12% |
| Average | -0.26 | 1.42 | 106% | 119% |

Note: Headline was applied at early emergence of the flag leaf.

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Table 5: 2005 Fungicide Spring Wheat – Strip Plots

| Site Location | Treatment | Yield (Treated - Untreated) | % Change in Fusarium | % Change in VOM |
|---------------|-------------------------|-----------------------------------|-------------------------|--------------------|
| Osgoode | Headline - early | -10.6 | 9% | 0% |
| Kemptville | Headline - early | -3.5 | 0% | -51% |
| Pakenham | Headline - early | 1.5 | 212% | 334% |
| | Average | -4.2 | 74% | 94% |
| Kinburn | Headline @ flag leaf | 6.7 | -98% | 18% |
| Renfrew | Tilt @ flag leaf | -2.3 | -52% | 0% |
| | Average | 2.2 | -75% | 9% |
| Osgoode | Folicur Only | 11.8 | 26% | 8% |
| Renfrew | Folicur Only | 0.1 | -55% | 0% |
| Kemptville | Folicur Only | 5.5 | 100% | 58% |
| Pakenham | Folicur Only | 3.4 | 371% | 474% |
| | Average | 5.2 | 111% | 135% |
| Kemptville | Headline + Folicur | 6.2 | -5% | -13% |
| Pakenham | Headline + Folicur | 5.8 | 376% | 103% |
| | Average | 6.0 | 186% | 45% |

Table 6: 2006 Fungicide Spring Wheat – Strip Plots

| Location | Variety | No Fungicide | 1/2 rate Headline + No Folicur | Difference (bu/ac) |
|-----------|-----------|-----------------|--------------------------------------|-----------------------|
| Brinston | Sable | 55.1 | 57.3 | 2.2 |
| Douglas | Sable | 72.8 | 73.6 | 0.8 |
| Beachburg | AC Barrie | 50.4 | 54.2 | 3.7 |
| Vernon | 606 | 57.9 | 59.3 | 1.4 |
| | | | Average | 2.0 |

Comparison of Headline at ½ rate applied with the grower’s herbicide, followed by an application of Folicur vs. Folicur only.

Note: FOLICUR only was better than combination with the HEADLINE

Table 6b: 2006 Fungicide Spring Wheat – Strip Plots

| Location | Variety | Folicur Only | Headline 1/2 rate + Folicur | Difference (bu/ac) |
|--------------|----------|--------------|-----------------------------|--------------------|
| Chesterville | 606 | 65.3 | 64.7 | -0.6 |
| Pakenham | Sable | 76.6 | 75.2 | -1.4 |
| Douglas | Sable | 74.2 | 73.3 | -0.9 |
| Osgoode | AC Brio | 67.2 | 62.6 | -4.5 |
| Osgoode | Sable | 78.4 | 72.2 | -6.2 |
| Kemptville | Winfield | 55.2 | 53.9 | -1.3 |
| Osgoode | Sable | 71.3 | 66.6 | -4.7 |
| Vernon | 606 | 66.1 | 65.5 | 0.7 |
| | | | Average | -2.4 |

Summary:

HEADLINE, TILT and FOLICUR cost about \$13.00 to \$15.00 per acre plus application. Custom application rate is about \$9.00 per acre. Grain yield loss due to sprayer trampling is about 2.5% or about 1.5 to 2 bu/ac. The break-even on spring wheat is about 5.5 bu/ac (\$22/ac @ \$5.25/bu = 4bu +1.5 bu for trampling). In 2005, the leaf disease pressure was low at most sites. Under these conditions, yield response would not be expected to be great. Only when leaf diseases are present would there be an economical yield response to the HEADLINE or TILT such as at the Kinburn site. FOLICUR was applied in only 4 side-by-side comparison strips in 2005. The average yield advantage was 5.2 bu/ac. However a project conducted from 2001 to 2003 with FOLICUR has shown only an average yield advantage of only 1.7 bushels/acre. The use of ½ rate HEADLINE with the herbicide application would need about 1.5 bu /ac to break-even.

Next Steps:

2006 crop year was the final year of this 3 year project.

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Project Contacts:

Scott Banks, OMAFRA, scott.banks@ontario.ca , 613-258-8359