

## HARROWING FOR WEED CONTROL AND IMPROVED YIELD

*Interim Research Report W2006-15*

### RATIONALE

Post-emergence harrowing is a technique used by some organic farmers for weed control. Although some farmers find this technique very effective, others find the prospect intimidating. Harrowing is an effective tool for weed management when it is selective - when it is aggressive enough to kill or damage weeds but not aggressive enough to kill or damage crop plants. Extensive research at the Scott experimental farm indicates that the balance of aggressiveness for field pea may be between 65 and 90% burial. The type of implement used to harrow is less important than the aggressiveness of the operation.

This study was initiated to determine what sorts of results farmers were having with harrowing on farm. Volunteers intended to harrow in 2005. We asked that they leave a strip that was not harrowed so we could compare weed numbers and crop yields in areas that were harrowed to those in areas that were not harrowed.



Spring tine harrow in action (B. Frick)

### ON-FARM HARROWING TRIALS

In 2005, we looked at 8 farm fields that had harrowed and not harrowed strips. We wished to consider the effect of harrowing, as done on organic farms. The farmers chose which fields and crops they were going to harrow, and harrowed with their own equipment at

times that they determined to be appropriate. Weeds were counted shortly after harrowing, in 20 quadrats, each 50 cm x 50 cm per strip. Crop and weed biomass and crop yield samples were taken by hand at maturity, in 5 quadrats per strip, each 50 cm x 1 m.

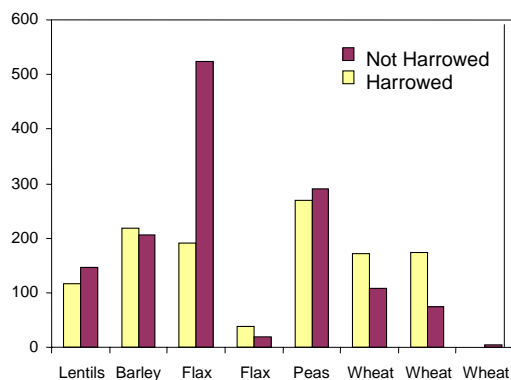


Figure 1. Weed biomass in harrowed and unharrowed fields for several crops, 2005

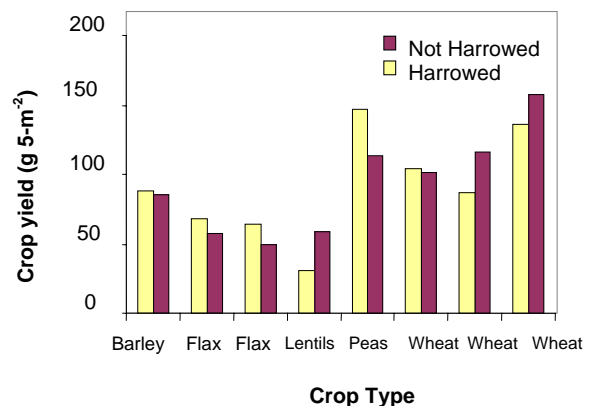
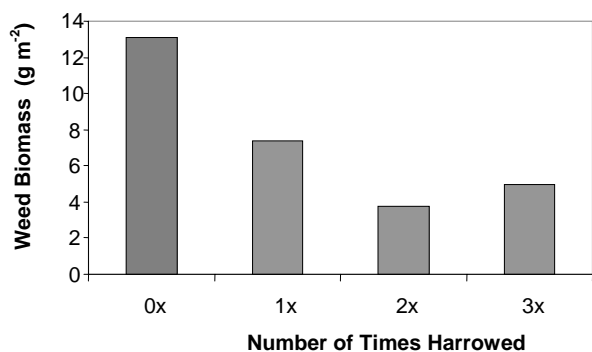


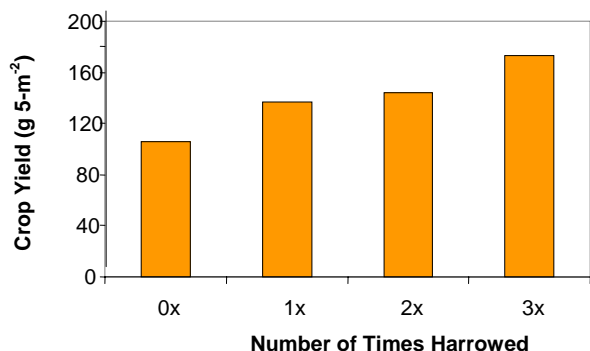
Figure 2. Crop yield for harrowed and unharrowed fields for several crops, 2005



**Figure 3. Weed biomass with increased harrowing frequency**

In the analysis of all of the harrowing trials, there were no strong overall trends. Some harrowed fields, particularly one flax field, had less weed biomass than those that were not harrowed (Figure 1), but some harrowed fields had more weed biomass than those that were not harrowed. Crop yields were higher in some harrowed fields, most notably one pea field, but they were less in others (Figure 2).

One farmer tested the effect of increased harrowing by harrowing one, two, three, or no times. Weed biomass was reduced with more frequent harrowing (Figure 3), and crop yields were increased (Figure 4).



**Figure 4. Crop yield with increased harrowing frequency**

### THE BOTTOM LINE...

Harrowing can result in good weed control and increased yield, but these favourable results are not always seen on farm.

### CREDITS

Jennifer Bromm, Brenda Frick and Roxanne Beavers (ed.)

### NEXT STEPS

The results presented here are very preliminary, from a single year, and in the case of multiple harrowing, from a single field. These can not be generalized beyond this scope.

In 2006 we hope to encourage more farmers to test the multiple harrowing option. We will limit the number of crops we examine, and strive for greater replication of each test crop. We will examine intensity of harrowing using photographs taken by the farmer immediately after harrowing. In this way, we hope to compare results on farm to those of organic researchers.



**Wayne Hovdebo harrowing (B. Frick)**

### ACKNOWLEDGEMENTS

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Dave Cook, Hazeldel SK

### FUNDING

Saskatchewan Agriculture and Food



Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada

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