

Client Identification Information: Dr. Martin Entz, Department of Plant Science, University of Manitoba.

Project Title: Control of late-season herbicide escapes and volunteer canola by selective cutting using the CombCut.

Project Overview

This Carman-based project tested the effects of the Combcut machine in RR soybean. The main purpose was to determine whether the combcut could be used to control canola volunteers in soybean.

Background and Objectives

The risk of developing herbicide resistance, problems with volunteer canola in soybeans and general interest in reducing chemical use to reduce production costs are reasons to create recommendations for mechanical weed control use in an integrated weed management (IWM) strategy in soybean. Selective cutting through use of the CombCut allows for the removal of weeds below the crop canopy. The CombCut a tool developed in Sweden, moves below the crop canopy cutting weeds, while no damage occurs to the crop (Lundkvist and Verwijst, 2011). Additionally, the cutting of seed producing parts will prevent the return of weed seeds to the seedbank, and can increase the quality of the target crop (Lundkvist and Verwijst, 2011). Research conducted in Sweden examined the efficacy of selective cutting using the CombCut to manage seed production of thistle (*C. arvensis*). It was found that selective cutting was comparable to early and late herbicide treatments in its ability to reduce seed production of *C. arvensis* a thousand-fold (Verwijst et al., 2017).

The objectives of the project are to: 1) test, and create recommendations for the use of the CombCut in soybean; 2) Test the reduction of weed seed return using the CombCut to manage volunteer canola and late season weed escapes and 3) evaluate possible yield benefit of managing above canopy weeds and volunteer canola.

Project Summary

Experiment 1: Frequency of selective cutting using the CombCut to manage herbicide escapes and volunteer canola in soybean

This experiment was (is being) conducted at the Ian N. Morrison research farm. Glyphosate-tolerant canola was seeded along with glyphosate tolerant soybean to simulate volunteer canola. The experiment was a randomized complete block design with four replicates.

Treatments were based on number of CombCut passes as subsequent periods over time.

| Treatment | Frequency |
|-------------|--------------|
| 1 (control) | No CombCut |
| 2 | One pass |
| 3 | Two passes |
| 4 | Three passes |

- **Measurements:**

- Weed density (before CombCut)
- Crop and weed biomass (before harvest)
- Weed seed biomass (before harvest)
- Yield
- Dockage



Carman: Left- no combcut; Centre-two passes; Right- three combcut passes

Experiment 2: Timing of selective cutting using the CombCut to manage herbicide escapes and volunteer canola in soybean This experiment was (is being) conducted at the Ian N. Morrison research farm at one location. Glyphosate-tolerant canola was seeded with glyphosate tolerant soybean to simulate volunteer canola. This trial was conducted in a completely randomized design with four replicates. Treatments are based on percent flower of target weed species.

| Treatment | CombCut placement | Percent flower (target weed) |
|-----------|----------------------|------------------------------|
| 1 | Above Canopy | 25 |
| 2 | | 50 |
| 3 | | 75 |
| 4 | | >75 |
| 5 | Within Canopy | 25 |
| 6 | | 50 |
| 7 | | 75 |
| 8 | | >75 |
| 9 | Control (no CombCut) | Control (no CombCut) |

Measurements same as experiment 1.



Left: Combcut at 75% canola flower within canopy; Right: 25% flower within canopy.

Experiment 3. On-farm testing of the combcut to control RR canola in RR soybean.

The field site for this experiment was conducted on a commercial soybean field near Portage la Prairie.

Knowledge Transfer Activities

A field day was held at Carman on July 16 plus the experiments were featured at the Pulse “Smart Day”. A total of 160 individuals visited the plots. We will feature this study on our website and host a webinar on the project.

Issues

No major issues – the experiments were conducted as planned.