

Performance & Cost Benefit of Optical Spot Spraying Technologies in Conventional, Dryland Farming in Western Canada

Crop Research



RESEARCH QUESTIONS:

- Assess the practicality as well as the economic benefit of spot spray technology
- Evaluate functionality and performance of WEED-IT Spot spraying technology
- Determine the total economic and agronomic benefit of optical spot spraying technology for Western Canada (2021 & 2022)

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Method

- Fields = 2 (2E & 2W)
- Zones = 4 (based on historical yield maps)
- Pre-seed Spray Treatments = 4
 - Full spray mode
 - Bias spray mode
 - Spot spray mode
 - Control (no pre-seed herbicide application)
- Crops = 2
 - Canola - seeded in barley stubble/residue (2021)
 - Barley - seeded in canola stubble/residue (2022)

Results

- Up to 97% chemical application reduction in Spot mode
- Up to 26% chemical application reduction in Bias mode
- Apparently, pre-seed spray treatments did not have a significant effect on yield
- Compared to the other spray mode treatments, profit-loss ratio was highest when WEED-IT was operated in Spot spray mode

Findings

- Hidden or very small weeds that were not exposed to pre-seed herbicide application
- Seeding operation exposed weeds that were previously hidden, but were not exposed to the pre-seed herbicide treatment
- Uncertain what, if any effect, pre-seed herbicide application had on yield, following a conventional, select (green-on-green), in-crop herbicide application

Future Research/Next Steps

- Repeat strip plot study in 2022 with barley seeded in the same fields on canola stubble
- Consider the effects of reduced chemical usage on other sustainability attributes such as soil health
- Explore the potential viability and feasibility of green-on-green precision spraying technologies

