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Is spraying by moonlight effective?

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Ken Coles, left, of Farming Smarter tells participants at the June 24 Lethbridge field school about spraying trials that explore the effectiveness of herbicides when applied in the morning, midday and midnight. | Barb Glen photo

Improving effectiveness | Researchers tested various types and rates of chemicals and how they respond to spray timing

It's midnight in the canola field and all is quiet, except for the distant chirping of crickets — and the rumble and hiss of the sprayer.

Equipment technology has evolved to where night spraying is no harder than day spraying, which can be handy when timing is crucial and acres are many.

But does spraying at night provide effective weed control?

A three-year study undertaken by the Farming Smarter research group based in Lethbridge sought to find the answer.

Now wrapping up Year 3, researchers have bad news for early birds. The common practice of morning spraying for pre-seeding burn-down is less effective than either midnight or midday, with midday showing best results.

Initial results for in-crop spraying show midday herbicide applications have the highest efficacy in peas and canola, while midnight applications provided best control of grassy weeds.

Information about the trials was a topic of discussion at the Farming Smarter field school, which ran June 24-26 in Lethbridge.

“The advent of autosteer has sort of expanded the opportunity to spray at night time, and some guys are crazy enough to do it,” said director Ken Coles.

“You do the outside round (first), you make sure you know where your potholes are, and it does give you an expanded window of operation.”

However, most registered herbicides were tested for daytime application, so trials designed by Agriculture Canada research scientist Bob Blackshaw sprayed crop plots at dawn (4 to 5 a.m.) noon (12-1 p.m.) and midnight (12-1 a.m.)

Plots included Liberty Link and Roundup Ready canola, peas and wheat. Various types and rates of chemicals were tested, creating reams of data that will be crunched over the coming months.

“When I started off in this endeavor, I really didn’t think, to be honest, that we would see the differences that we have,” said Coles.

“I think it’s one of these opportunities that if we have a better understanding of which herbicides work under which conditions, we might be able to come up with a bit of a schedule that will maximize our efficacies.”

Differences between the spray timings were more significant in early growth stages, but tended to level out before harvest, according to early data.

Blackshaw said research results brought surprises but also assurances about night spraying.

“Some of this research has shown that in some cases with some herbicides there’s not a large negative effect, so I think producers that still want to do that, especially if they get behind because of adverse weather conditions ... it’s not an absolute no-no.”

However, he said for some herbicides, spraying in the daytime provides better results.

“I think that’s especially true for early in the year ... when we have cooler conditions.”

It has proven more difficult to analyze how herbicides with different modes of action respond to spray timing. Blackshaw said he thinks it plays a role, but more research is needed for definitive answers.

However, temperature at time of spraying definitely makes a difference, Blackshaw told farmers at the field school.

He said daytime temperatures of at least 10 C are needed for herbicides to be effective.

“The crop needs to grow so it can metabolize the herbicide and break it down so it’s not injured, and the weed needs to grow so that the herbicide can actually do the job on it.”

It means reasonably warm, sunny conditions. The more actively weeds are growing, the better the herbicide can kill them.

Coles said temperatures generally reach their 24-hour lows in the early morning, when relative humidity is highest and dew is heaviest. That will affect chemical efficacy.

Dew might help the chemical spread on the plant, and leaves may be more hydrated, but that doesn’t necessarily mean the plant is efficiently translocating the ingredients because it is not photosynthesizing.

The Alberta Canola Producers Commission and the Alberta Barley Commission funded the night spraying research.