Canadian Agronomist

DIGGING INTO RESEARCH

Manage canola harvest to optimize winter wheat production

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Winter wheat following late- or early-maturing canola hybrids had similar grain yields, but straight-cutting canola reduced the subsequent winter wheat yield. Applying pre-harvest herbicides while swathing with an on-board sprayer was effective in controlling weeds and maintaining winter wheat yields. Pre-harvest + pre-plant herbicides eliminated the need for an in-crop winter wheat herbicide in the spring.

With the shift to straight cutting of later maturing canola hybrids, there is a need to update winter wheat management practices in a canola-winter wheat rotation. The objectives of this study were to investigate how early- and late-maturing hybrid canola and harvest timing impact the subsequent winter wheat crop. Additionally, the research also tested winter wheat herbicide applications while simultaneously windrowing canola.

Field experiments were conducted near Lethbridge and Lacombe, AB, Indian Head and Saskatoon, SK, and Brandon, MB from 2018 to 2022 for a total of 16 site-years. Two canola hybrids with pod-shattering reduction traits were compared: InVigor L233P (early-maturing) and InVigor L255PC (late-maturing). AAC Wildfire was the winter wheat variety used in the study at all locations.

The three harvest timings included i) early windrowing performed at 40 % seed color change (early-timing), ii) conventional windrowing performed at 60 % seed color change (conventional-timing), and iii) straight-cutting at 10 % seed moisture (straight-cutting).

The weed management treatments included: i) pre-harvest herbicide in canola (pre-harvest), ii) pre-plant herbicide for winter wheat (pre-plant), and iii) pre-harvest plus pre-plant herbicides (pre-harvest+pre-plant).

The pre-harvest herbicide was a tank mix of Heat LQ herbicide (saflufenacil) plus glyphosate applied during the windrowing operation using an on-board sprayer. For the straight-cutting treatment, the pre-harvest herbicide was applied at 60% seed color change. The pre-plant herbicide was Focus (pyroxasulfone) applied as a pre-seed burn-off treatment prior to winter wheat seeding.

Winter wheat yield trended higher after windrowed canola

In this research, straight-cut canola yielded similar to windrowed canola. However, it reduced the subsequent winter wheat crop yield by 4.9% compared to the early-window treatment and by 4.3% for the conventional windrow timing. The research suggest this may be attributed to lower soil moisture availability following straight-cut operations.

Early and conventional windrow timing had similar winter wheat yields in the subsequent crop.

Fall weed control improved winter wheat yield

Winter wheat yield was 2.2% higher when a pre-harvest herbicide application was conducted compared to a pre-plant only fall application. A combined pre-harvest + pre-plant residual herbicide application resulted in a 3.8% winter wheat yield increase compared to pre-plant only application.

The application of a pre-harvest herbicide was effective in controlling broadleaf weeds in the fall. The combined pre-harvest + pre-plant residual herbicide controlled grassy weeds in the fall and broad leaf weeds in the spring. This was consistent for both the early- and later-maturing varieties.

On the other hand, a pre-plant herbicide only application with either conventional windrowing or straight-cutting slightly reduced the succeeding winter wheat grain yield. This highlights the importance of a pre-harvest herbicide application in the canola crop preceding winter wheat, which if performed simultaneously with canola windrowing, eliminates an operational preseed step from the winter wheat system.

This study reinforces previous research that found that in-crop herbicide applications may be unnecessary because winter wheat is highly competitive against weeds.

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