

Higher returns with an IWM strategy in zero-till barley-pea rotations

An economic analysis of an Integrated Weed Management (IWM) research study is helping to shed light on how IWM can provide greater contribution margins to zero-till farmers. A barley-pea IWM rotational study conducted under zero-till in the Black Soil zone at Lacombe, Alberta assessed the interaction of seeding date (late April or late May), seeding rate (recommended or 150% of recommended), fertilizer timing (fall or spring banded), and in-crop herbicide rate (50% or 100% of recommended).

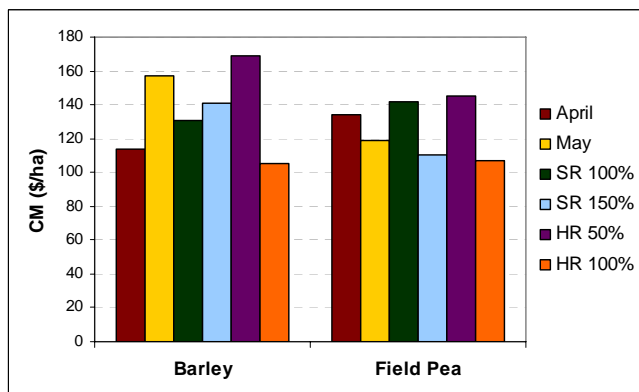
This study, conducted by Agriculture and Agri-Food Canada, concluded that the most competitive cropping system in the study was the combined use of early seeding, higher seeding rates, and spring-applied fertilizer, and that crop yield, weed biomass, and weed seed bank were often similar between the 50% herbicide rate and the 100% herbicide rate when a competitive crop was established.

AAFC researchers analyzed the profitability of IWM strategies in the study. For barley-pea production, the highest contribution margin (CM) (returns over variable production costs) was earned with 50% of the recommended herbicide rate, spring application of N fertilizer, seeding barley later at the high seeding rate, and seeding field pea early at the recommended seeding rate. This IWM system had a CM benefit of at least \$51/ha (\$20.65/ac) compared with current common practices.

Seed pea at recommended rates

The CM from barley was found to be the same for the recommended seeding rate and 150% of the recommended rate. The higher seeding rate for field pea had a lower CM of \$32/ha (\$12.95/ac) than the recommended rate. Field pea seeded at higher rate did not result in higher yield, and since seed costs were higher at the higher seeding rate, the CM is lower.

Spring applied N fertilizer was more profitable. The added field operation costs of fall-applied fertilizer were greater than the savings from slightly lower N fertilizer costs in the fall, and there was no yield benefit to fall application.



Mean contribution margin for a barley-pea rotation at Lacombe, Alberta (1999-2001).

Legend: April = April seeding; May = May seeding; SR100% = Recommended seeding rate; SR150% = 150% of recommended seeding rate; HR50% = 50% of recommended herbicide rate; HR100% = Recommended herbicide rate.

Conversion: \$/ac = \$/ha divided by 2.47.

Source: Smith, E. G., Upadhyay, B. M., Blackshaw, R.E., Beckie, H. J., Harker, K. N., and Clayton, G. W. 2006. Economic Benefits of Integrated Weed Management Systems for Field Crops in the Dark Brown and Black Soil Zones of Western Canada. *Can. J. Plant Sci.* 86: 1273-1279.

Seed pea first

Seeding date was not significant for field pea, but the May seeding date was more profitable than the April date for barley. The shorter growing season for barley may facilitate later seeding without a yield penalty. Based on this study, and a second wheat-canola IWM rotational study, the best crop timing for seeding would be to seed canola and pea first, then wheat, and seed barley last.

Lower herbicide rates

The CM for 50% of the recommended rate herbicide application was greater than or equal to the recommended herbicide rate. The benefits of reduced herbicide rate ranged from \$64/ha (\$25.91/ac) for barley to \$38/ha (\$15.39/ac) for pea. The reduced herbicide rate might benefit from an increased seeding rate, but this study was not conclusive on the benefits of the combined practices. While lower rates of herbicide were more profitable in this study, knowing the impact of growing conditions on the efficacy of lower rates would also help farmers make improved decisions.