Volunteer canola has become a common weed in western Canada and researchers wanted to find out whether genotype, environment or other factors had the most influence. The results show that secondary dormancy appears to be under genetic control and varies between canola cultivars. Screening new canola varieties for dormancy induction, combined with good in-crop control of volunteers should reduce the prevalence of volunteer canola as a weed in western Canada.

Volunteer canola, which has become a common weed in western Canada, establishes a seedbank through large harvest losses of viable seed (3000 viable seed/meter²). These losses are usually equivalent to at least 10 times the normal seeding rate of canola. The length of time a seed can last in the seedbank is a function of the ability of the seed to develop secondary dormancy, which is the ability of a seed to remain dormant (not germinate) when all of the conditions that would normally cause germination are present.

In this project, researchers wanted to determine why volunteer canola has become such a common weed and to suggest ways in which it can be managed. The objectives of the project experiments were to determine the relative importance of genotype, seed size, time of windrowing, temperature, tillage system, and environment on the expression of secondary seed dormancy in spring B. napus.

Using a lab test developed in Europe, researchers determined that many Canadian canola varieties do have the ability to develop secondary dormancy. This characteristic appears to be under genetic control and varies between canola cultivars. The environment that the canola is grown in has relatively little effect on its dormancy induction. A lab assay also confirmed that high temperatures induce dormancy in canola varieties that are susceptible to it. The experiments also showed there was no clear advantage of zero-till over conventional tillage in reducing the longevity of the volunteer canola seedbank.

Overall, the results indicate that producers should attempt to reduce seed loss at harvest in order to prevent canola seeds from being introduced into the weed seedbank. As early swathing does not increase dormancy, producers should swath at the recommended time and attempt to avoid seed shatter. Following harvest, producers
should not deep till their fields as canola seed that remains near the soil surface does not persist as long.

Volunteers should be controlled in crop to eliminate the chance of the seedbank being replenished. In these experiments, all of the volunteer canola always emerged before the timing of the in-crop herbicide application so there should be opportunity to control volunteer canola with herbicides. Producers should carefully plan their crop rotations so that herbicide options exist for controlling volunteers.

Although seed dormancy is genetic and varies between canola cultivars, information with respect to the seed dormancy potential of individual genotypes is currently not readily available to producers. Therefore, it is recommended that the canola seed industry begin to screen new canola varieties for dormancy induction using the lab assay refined in this project. By only releasing canola varieties with a low potential for induction into secondary dormancy, the persistence of volunteers should be drastically reduced. This step combined with good in-crop control of volunteers should reduce the prevalence of volunteer canola as a weed in western Canada.

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