Sun Grant Western Regional Center
Oregon State University

Camelina Improvement for Insensitivity to Residual Herbicide Activity

Scot Hulbert, Washington State University (2009-2011)

OVERVIEW

Camelina is a newly emerging crop that has considerable potential as a biofuels feedstock in the inland Pacific Northwest and also has potential for making cropping systems more sustainable. However, it is extremely sensitive to residual amounts of certain herbicides (Group 2, imidazolinone) in the soil, which could hinder adoption of the crop by potential growers. Dr. Hulbert and his co-PI have initiated a program to develop Camelina lines that are resistant to these herbicides, thus reducing the risks to those who want to adopt this crop as part of their crop rotation plan. The ultimate goal is to quickly release these new lines of Camelina to all interested breeders and seed producers.

Progress to Date

The team is making good progress toward releasing imidazolinone tolerant Camelina lines. The results of work so far have indicated that tolerance can be achieved in Camelina by mutagenesis, and that these mutants can be inherited as single genes. The team has made crosses between four imidazolinone resistant mutants and one sulfonyl urea resistant mutant. The team was not able to select plants with a higher level of resistance in the second generation (F_2) progeny of the different crosses. They are in the progress of making F_2 populations between the two different classes of resistance. F_2 progeny of the first imidazolinone resistant mutant in the Cheyenne background was crossed to the Calena line and the progeny were selected for resistance to the herbicide Pursuit and grown to maturity. Next generation F_3 families from resistant plants were then tested to identify lines with uniform resistance. Approximately 20 of these F_3 families are to be increased for planting in the coming spring; this seed will be bulked for release. Finally, the single sulfonyl urea resistant mutant was tested for resistance to Pursuit and found to be more resistant that the four imidazolinone resistant mutants. Since this is resistant to both subclasses of the group 2 herbicides, this is now the favored mutant and will be bred for release. This mutant occurred in the Cheyenne background and is currently being crossed to the Calena line. Vigorous and resistant individuals will be selected from an F_2 family.

Collaborators

Ian Burke, Washington State University (co-PI)

Technology Transfer

- Presentation at Pacific Northwest Direct Seed Association, January, 2009.
- Washington State University Extension meeting to oilseed crop growers, Odessa, WA, October, 2009.

Funding Sources

- U.S. Department of Transportation, Research and Innovative Technology Administration
- Cost share: Washington State University

Contact: Scot Hulbert, Department of Plant Pathology, Pullman, WA
509-335-3722, scot_hulbert@wsu.edu

$89,428 in federal funds