

Approaches to Weed Control for Brassicaceae Crops

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Brassicaceae crops include canola, rapeseed, mustard, camelina and other species. These crops are generally regarded as oilseed crops although there may be other end uses.

While brassica crops are relatively well established in North America, there are very few herbicides label for use in their production. According to the Pesticide Information Center On-Line (PICOL; <http://picol.cahe.wsu.edu>) in the state of Washington there are 10 and 3 herbicide active ingredients labeled for use in canola and yellow mustard, respectively, while there are 44 herbicide active ingredients labeled for wheat. Currently, there are no herbicides labeled for use in camelina. Moreover, the herbicides labeled for canola and are very limited in their spectrum of control. Even in Canada where canola acreage is substantially greater than in the U.S. the number of labeled herbicide active ingredients is limited.

The development of herbicides for use in brassica crops has largely focused on developing herbicide resistant (HR) crops. These include Roundup-Ready, Liberty-Link or Clearfield systems. HRC canola systems have gained wide acceptance in North America and are grown on greater than 80% of the acreage in Canada. No HRC varieties of yellow mustard or camelina are currently commercial available. Roundup-Ready and Liberty-Link HRCs were developed using genetically modification (GM) and are restricted somewhat in international markets. The positive and negative aspects of GM crops and market acceptance have been discussed at length. Additionally, there are concerns about the development of resistant weeds through the heavy use of HR crops.

A bigger obstacle to widespread adoption of Brassicaceae crops in eastern Washington is the injury caused to these crops by persistent herbicides used in cereal grains and legumes. For instance, canola cannot be planted for a minimum of 40 months following the use of Pursuit herbicide. Pursuit is the most commonly used herbicide in grain legume production in eastern Washington. In addition to the 40 months, the fields must complete a bioassay to ensure they are safe for the plant back of canola. This bioassay may take an additional year which means canola can't be planted for over 4 years following a Pursuit herbicide application. Many of the more popular herbicides in wheat don't allow the planting of canola for two years or longer following their application. Additionally, the exact plantback restrictions will often depend on factors such as soil pH and annual precipitation. Most of the research done in developing plantback restrictions was done outside of the PNW in different environments. Thus, labeled plantback restrictions are not hard and fast, but served as guidelines across much of eastern Washington.

Yellow mustard is such a minor crop that its plantback restrictions are rarely listed on pesticide labels. An exhaustive search of herbicide labels did not find a single mention of camelina.

In summary, weed control in conventionally produced Brassicaceae crops is limited due to very few labeled herbicides. Genetically modified, herbicide resistant crop systems have the greatest potential for weed management programs, but resistant varieties aren't currently available. However, an even greater problem than weed control in the crop is the ability of the crops to tolerate the soil persistence of commonly used wheat and legume herbicides. The persistence of these herbicides may not allow the planting of Brassicaceae crops for over 4 years.