

## IMI Tolerant Chickpeas

By Megan Madden

The University of Saskatchewan's Crop Development Centre (CDC) recognized that the imidazolinones (IMI) class of herbicides is currently being used on chickpeas in other parts of the world such as Turkey. Acetolactate synthase/acetohydroxyacid synthase (ALS/AHAS) inhibitors (Group 2) have been shown to provide a broad spectrum of weed control activity, flexibility in timing of application, low usage rates, and low toxicity. In 2009, the CDC began to evaluate chickpea germplasms for tolerance to a mixture of imazethapyr and imazamox to identify germplasm for potential use in development of herbicide resistant cultivars by conventional breeding methods. The first of these varieties will be on the market, at the earliest, in 2018. "Currently, the CDC chickpea breeding program is introgressing the resistance into the germplasm base in the breeding pipelines, so we could expect that all the future chickpea releases will have the IMI tolerance," predicts Bunyamin Tar'an, Associate Professor with the University of Saskatchewan and Plant Breeder at the CDC.

"IMI tolerant chickpeas are specific genotypes/cultivars that can withstand the application of imidazolinones, especially imazethapyr and imazamox," says Tar'an. "Currently there are only a few options of chemical weed control are available for use in chickpea including sulfentrazone, saflufenacil, and metribuzin, of which metribuzin is the only chemical that can be applied post-emergence. Therefore, increasing the post-emergence herbicide available to growers will help to stabilize chickpea production."

Through the breeding process, two cultivars have been developed: CDC Cory (Desi-type) and CDC Alma (Kabuli-type). CDC Cory is one of the highest yielding Desi-types available for growers in Saskatchewan and it shows good resistance to ascochyta blight paired with a medium maturity. CDC Alma also has high yield potential however, it is more susceptible to ascochyta blight compared to the newer cultivars.

Field scale experiments are ongoing to examine the comparative performance of the conventional and the IMI tolerant chickpea cultivars. These field trials saw the conventional varieties CDC Luna and CDC Corinne display moderate to severe injury compared with resistant cultivars CDC Alma and CDC Cory, which showed minimal to no injury to the imidazolinone. All treatments of IMI herbicide caused yield reduction in the conventional cultivars in 2013. Conventional cultivars also experienced height reduction and decreased rate of node development compared with the non-treated controls.

Conversely, the IMI tolerant plants of CDC Alma and CDC Cory demonstrated no negative response in height, node development, days to flowering, maturity, and yield. These results illustrate the potential use of IMI herbicide in-crop on tolerant chickpea cultivars to control broadleaf weeds.