ORGANIC WEED MANAGEMENT IN SMALL GRAIN CROPS. [1]Steven J. Shirtliffe, Eric N. Johnson, [1]Yvonne E. Lawley, and [1]Julia M. Baird. [1]Department of Plant Sciences, University of Saskatchewan, [2]Agriculture and Agri-Food Canada, Scott Research Farm, Box 10, Scott, SK, Canada, S0K 4A0.

Saskatchewan has approximately 400,000 acres of certified organic, small grain production. Because herbicides are prohibited, weed control is one of the biggest production challenges facing these producers. The objective of this presentation is to outline research that we have conducted that evaluates weed control in organic small grain production. Organic production of short, non-competitive crops such as flax and lentils is very difficult due to weed competition. Increasing the plant population of lentils well above what is recommended provides weed suppression and increases lentil yield. In flax we have investigated the effect of late seeding early flowering genotypes to avoid weed competition. Seeding after June 1 usually allowed for less weed competition because of lower weed populations. Genotypes selected for early flowering tended to have higher relative yield when late seeded. Because small grain crops are solid seeded in narrow rows, inter-row mechanical weed control is not possible. One method of mechanical weed control that can be used is in-crop harrowing where both the crops and weeds are harrowed following crop emergence with special built weeding harrows. Overall, wheat, oats and barley were quite tolerance to in crop harrowing. Tolerance decreased slightly from the two leaf stage to the six leaf stage in these crops. However harrowing did not provide adequate weed control of wild mustard and wild oat once the weeds were established. Novel methods of mechanical weed control including mowing annual crops, and rolling flax were also investigated. Mowing at the 4.5 leaf stage decreased broadleaf weed biomass, but grassy weed biomass increased. In general these methods did not provide any selectivity against the weeds and usually reduced crop yields more than the weedy controls. In summary we have found that methods that enhance competition and avoid weed infestations provided substantial weed control in organic crop production. Mechanical weed control of weeds in annual cereals is difficult probably because of morphological similarities between the crops and weeds, particularly cereal grain crops and wild oat. Further research needs to be done focusing on the growth stage of the weed at the time of the mechanical weed control operation.

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