

Flax Breeding in Canada: Challenges and Opportunities.

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Abstract

Canada has produced and exported more flax than any other country since 1994. Europe was the major export market prior to 2009, but transgenic flax discovered in a shipment of Canadian flax halted such exports, initially resulting in a steep decline in flax planted across the prairies. The entire flax industry worked together to institute the farm stewardship program, and the Crop Development Centre (CDC) reconstituted its commercial flax cultivars to alleviate concerns about transgene contamination. As a result, huge changes in flax production and export dynamics occurred over the past 3-5 years; Canada now accounts for ~30% of world production and Canadian exports for ~50% of global flax trade. Currently registered cultivars have both brown or yellow seed coat and high levels of alpha-linolenic fatty acid (ALA). Canada is the first country to allow a health-related claim for flaxseed use on food labels, linking ground whole flaxseed to lower cholesterol (a major risk for heart disease). Addressing key production issues would see flax more widely grown by Canadian producers and help to sustain conservation farming on the prairies. Breeding targets include crop traits associated with climatic adaptation, ease of harvest, increased yield (yield stability), and seed quality traits of interest to the market. New cultivar releases exhibiting improved yield potential across the prairies compared to popularly grown CDC Bethune include CDC Glas (103%) registered in 2012; CDC Neela (105%) and CDC Plava (106%; targeting the shorter growing season zone) registered in 2015; CDC Buryu (106%; 108% in the brown soil zone) registered in 2017, and CDC Rowland (112%; 117% in the longer season black and grey soil zone) registered in 2018. Specialty yellow seed coat high ALA CDC Melyn and CDC Dorado, registered in 2016 and 2017, respectively, were developed for the emerging human health and animal nutrition market.