

BRE1515: SoyaGen: Improving yield and disease resistance in short-season soybean

Soybean is a rapidly growing crop that offers many potential benefits to Canadian growers. It is a multipurpose crop whose seeds are an extremely valuable source of both protein and oil, for either humans or livestock. From an environmental point of view, it is also highly attractive, as it does not need any chemical fertilizer to provide it with nitrogen, a major plant nutrient it naturally extracts from the air with the help of friendly bacteria in the soil. Three important challenges are faced when trying to develop high yielding soybean varieties that are well suited to Canadian conditions. Firstly, these varieties need to reach maturity and produce seed in record time, as Canadian summers are notoriously short. Secondly, these varieties need to be made more resistant to pests and diseases that will otherwise reduce crop yield and require the application of pesticides in some cases. Finally, soybean is quite a novel crop in many regions of Canada and there is room for considerable expansion, but key impediments to farmer adoption of this crop need to be identified and addressed. Genomics offers essential new tools to aid in this. Foremost, spectacular progress in sequencing technologies has made it possible to characterize the genetic makeup of crops like never before. By probing deep into the genetic code of soybeans, it is possible to identify DNA markers that control key aspects of plant growth such as the time needed to reach maturity and resistance to diseases and pests. Once we have identified such DNA markers, breeders will be able to use them more rapidly and easily to develop improved varieties. Economic and social research will complement the genomics research by focusing on institutions and policies that will maximize the growth potential of the soybean industry. We have assembled an exceptional group of ten research scientists and their teams to take on this task and have gained wide support from grower groups and key players in the seed industry. The project is led by Laval University and involves researchers from the University of Saskatchewan, University of Guelph, the CEROM, Agriculture, and Agri-Food Canada and Semences Prograin.