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The Canadian Potato Genome Project

Status	Past
Competition	Competition II
Sector	Agriculture
Genome Centre	Genome Atlantic
Project Leaders	Barry Flinn & Sharon Regan

Project Description

The potato is the 4th most important crop in the world, a major energy source in the diets of developing regions, and one of Canada's most significant agri-food exports. The current global production rate of 3% is likely to increase through the emergence of bio-products, in which starch platforms are positioned for high rates of growth.

The potato has been domesticated for more than a 1000 years. With the development of genomic technologies we now have the opportunity to go back to ancient varieties, identify gene sequences responsible for improved tuber quality and health traits, and reintroduce these back into modern potatoes. The Canadian Potato Genome Project was developed to identify genes responsible for tuber quality (after-cooking darkening, cold sweetening) and tuber health (late blight, common scab).

We have produced five major resources for potato research:

1. The production of high quality full-length cDNA libraries, generating at least 100,000 Expressed Sequence Tags (EST) from the Shepody potato, a significant contribution to the identification of genes in potato.
2. Along with other members of an international consortium, we helped develop a '44K microarray chip' used to identify genes related to tuber quality and tuber health traits, such as common scab and late blight.
3. The production of over 8,000 tagged mutants, by far the largest collection of genotypically unique transgenic potatoes in the world.
4. The establishment of hardware, network and personnel to meet the bioinformatics needs of the project.
5. An integrated GE³LS component that made significant advances in intellectual property (IP) and regulatory issues regarding genomics-assisted plant breeding.

The development of these important genomic resources, and the new collaborations that have been developed as a direct result of this project both nationally and internationally will ensure that we will make significant advances in improving potato tuber quality and health in the future.

Fast Facts

Highlighted outcome: a significant contribution to the identification of genes in potato, and the largest collection of genotypically unique transgenic potatoes in the world, resources that will contribute to improving potato quality and health

Number of research personnel employed by the project: 27

Resources generated: Canadian Potato Genome Project (CPGP) website provides search tools for both the CPGP and TIGR sequences, and is continually updated with relevant information

Co-funders: The Atlantic Canada Opportunities Agency's Atlantic Innovation Fund (ACOA-AIF) and the New Brunswick Department of Agriculture, Fisheries and Agriculture (NBDAFA)