**Pulse crop:** Pea

**Research category:** Improving the nutritional levels of the seed/development of new varieties

**Developing More Environmentally Friendly and Nutritious Pea Varieties**

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**A brief description of project**

- Pea has high levels of phosphorus, stored in pea seed in the form of phytate.
- Phytate is not well digested by humans and monogastric animals, resulting in P excretion.
- Phytate excreted contributes to environmental phosphorus pollution.
- It can also lead to micronutrient deficiencies, as iron and zinc are bound to phytate.

**Main goals of project**

- The main goal of this project is to breed pea varieties with low-phytate levels.
- This research leads to develop more environment friendly and nutritious pea varieties.

**Key outcomes of project**

- Two low phytate pea mutants (1-2347-144 and 1-150-81) were isolated through chemical mutagenesis of cultivar CDC Bronco.
- These lines were similar in agronomic performance to CDC Bronco, except for slower time to flowering and maturity, slightly lower seed weight and grain yield.
- Phytate phosphorus concentration in these lines was reduced by approximately 60%, with a compensating increase in inorganic phosphorus.
- Inheritance study was performed to show genetic control of low phytate in mutant lines.
- The crosses between the two low phytate lines revealed that they carried the same allele without any segregation.
- To map the genes associated with low phytate trait, two different Recombinant Inbred Lines (RILs) PR 14 and PR15 were developed.
- Characterization of pattern of phosphorus storage in developing grain tissues of two low phytate pea lines using HPLC is in progress.
- Determination of iron bioavailability of these lines and their effects on poultry performance is underway.

**Separation of different isomeric forms of phytate by HPLC**

Source: [http://www.dionex.com](http://www.dionex.com)

**Benefits to pulse growers in Saskatchewan**

- The broad goals of pulse crop breeding at the CDC are to improve yield and quality of Saskatchewan pulse crops.
- This project aims to offer Saskatchewan pulse producers low-phytate pea varieties that will ensure they grow high-quality, competitive products for local and international markets.

**Acknowledgement**

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