

Pulse crop: Pea

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

Developing More Environmentally Friendly and Nutritious Pea Varieties

Researchers: Arun Shunmugam, Tom Warkentin, Tamira Delgerjav, Gene Arganosa, Aziz Rehman, Xiaofei Liu,

Yadeta Anbessa, Kirstin Bett, Henry Classen, Raymond Glahn, Brian Rossnagel and Victor Raboy

Crop Development Centre, College of Agriculture and Bioresources, University of Saskatchewan, Saskatoon, Canada

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

Benefits to pulse growers in Saskatchewan

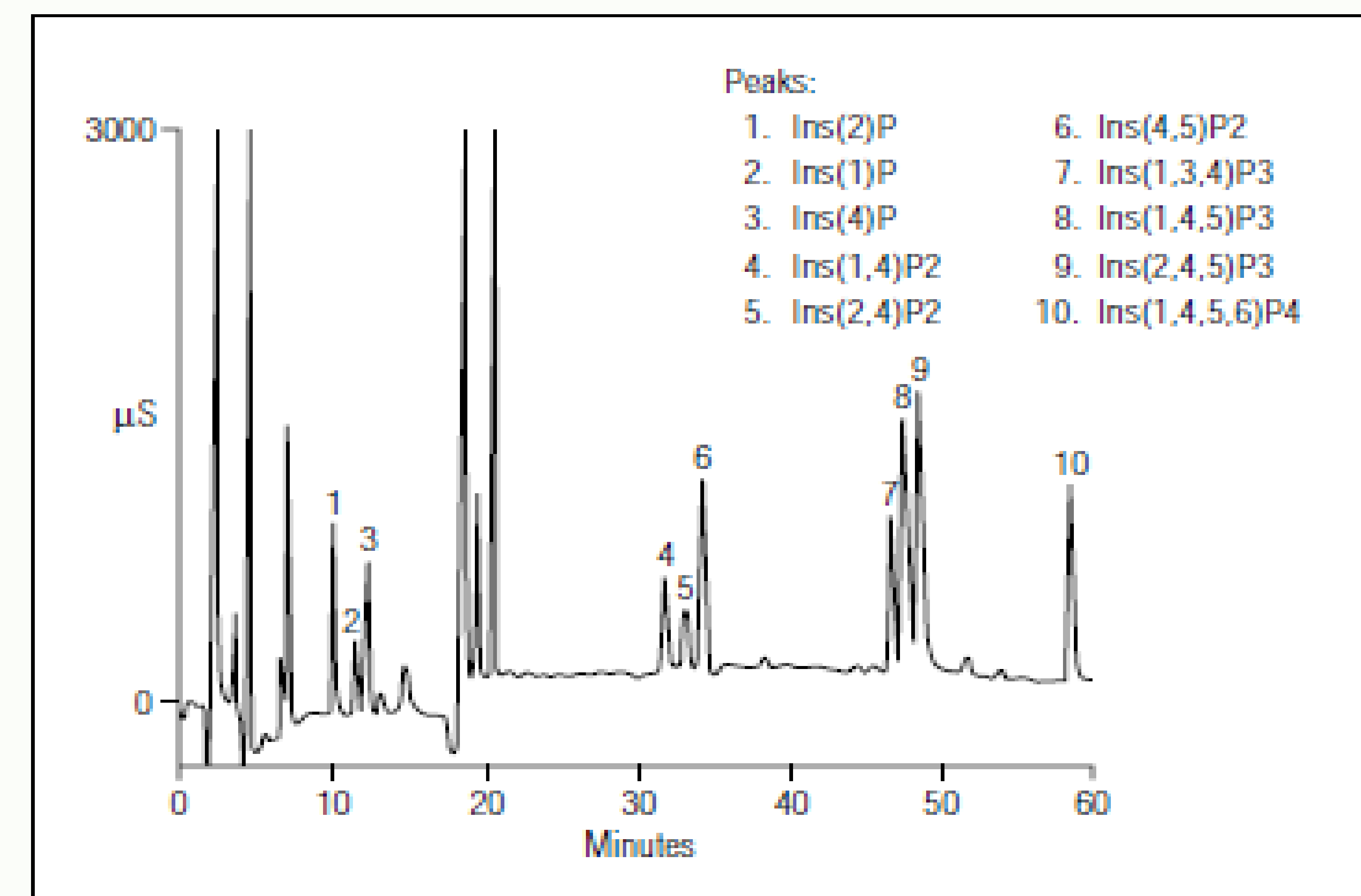
- The broad goals of pulse crop breeding at the CDC are to improve yield and quality of Saskatchewan pulse crops
- This project aims to offer Saskatchewan pulse producers low-phytate pea varieties that will ensure they grow high-quality, competitive products for local and international markets



Field trial 2011 at Rosthern, SK



Tagged pods of 1-2347-144



Separation of different isomeric forms of phytate by HPLC
Source: <http://www.dionex.com>

Acknowledgement

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