Assessing nitrogen fixation of faba bean for the prairies

Dr. Rosalind Bueckert
University of Saskatchewan – Dept. of Plant Sciences

SPG Contributions	Project Status	Duration/Timeline of Project (Year to Year)	Co-funders	Total Project Cost
$93,725.00	Completed	May 2009 – April 2012	Saskatchewan Ministry of Agriculture – Agriculture Development Fund (ADF) (amount unknown)	$93,725.00

Project Description

To improve the nitrogen (N) contribution of pulses in the cropping rotation by assessing the N budget of faba bean; to measure the biomass and nitrogen content of a range of faba bean genotypes and cultivars; to assess the N fixation ability of faba bean genotypes by shoot N metabolism under typical dryland prairie conditions and controlled stress conditions; to develop a ureide- and specific amino-acid screening technique to economically screen for high N fixation.

Outcome

The predictive methods developed were able to predict shoot biomass and total nitrogen (N) content of the shoot to about 70% accuracy based on the stem data from which they were generated, and detect half of the top 5 ranked genotypes. Such methods can allow for the screening for higher shoot growth, greater N acquisition, and greater amounts of N fixed by using a stem fraction in early reproductive growth, without requiring reference plots.

Research Objective

OBJECTIVE 1
To improve the nitrogen (N) contribution of pulses in the cropping rotation by assessing the N budget of faba bean.

OBJECTIVE 4
To develop a ureide- and specific amino-acid screening technique to economically screen for high N fixation.

OBJECTIVE 2
To measure the biomass and nitrogen content of a range of faba bean genotypes and cultivars.

OBJECTIVE 3
To assess the N fixation ability of faba bean genotypes by shoot N metabolism under typical dryland prairie conditions and controlled stress conditions.