# MEHDI FARID

BSc. Agronomy, MSc. Crop Physiology, Ph.D. Plant Breeding & Genetics

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## CAREER OBJECTIVE

To contribute to improving the quality and sustainability (both environmental and economic) of life on Earth by developing plants that fit better into the natural world and produce more with less by means of plant breeding and agronomic methodologies.

## COMPETENCIES AND WORK EXPERIENCE

- Physiological, molecular and microbiological methodologies associated with conventional and molecular breeding plants for yield, disease resistance, drought tolerance, nitrogen fixation, nitrogen use efficiency, and protein and oil content
- DNA and RNA extraction
- Embryo rescue, DH (doubled haploid) production, ovule culture, micropropagation
- Agronomy of canola, legumes and cereals
- Practical experience with plant tissue culture and embryo rescue
- Diagnosis of disease by classical approaches
- Designing & conducting field & greenhouse experiments
- Data Collection/Analysis
- QTL Mapping/Analysis
- Genome Wide Association/GWAS
- Application of genetic markers in molecular breeding/MAS
- Professional in databases and Microsoft Office applications
- Practical skills in seed production, storage, monitor stored seed and seed viability tests
- Hands-on skills in cropping - seeding, pest management and harvesting, including farm-scale and experimental machinery

## PERSONAL ATTRIBUTES

- Ability to handle multiple projects simultaneously in a fast-paced and dynamic environment
- Strong planning, organizing and monitoring abilities - an efficient time-manager
- Ability to work independently and in a team while maintaining consistency in the quality of output
- Easily learn techniques and train others with the same to enhance mutual productivity
- Ability to lead, motivate and stimulate others to achieve goals and inspire change
- Comfortable to work according to the situational requirements and invest extra time and efforts as and when required

## QUALIFICATIONS/CERTIFICATES

- Ph.D. Plant Agriculture (Plant Breeding & Molecular Genetics), University of Guelph 2016
- MSc. Plant agriculture (Crop Physiology), University of Guelph 2010
- BSc. Agronomy (Plant Breeding & Crop Production), Shiraz University 1995
- WHIMS Certificate
- Biosafety Certificate
- Emergency First Aid Certificate

## PROFESSIONAL EXPERIENCE

**UNIVERSITY OF ALBERTA – AGRICULTURE/FORESTRY RESEARCH CENTRE,** Edmonton, Alberta Current

***Postdoctoral Fellow***

Molecular plant breeding for disease resistance and broadening of genetic diversity in canola.

Current Projects

- Genetic screening of local and exotic *Brassica* germplasm for clubroot resistance

- Study the genetic basis of resistance to different *Plasmodiophora brassicae* strains in *Brassica* species
- Genome-wide association study of genetic basis of resistance to *Plasmodiophora brassicae* in canola (*Brassica napus*) and cabbage (*Brassica oleracea*) gene pools
- Pyramiding of clubroot resistance genes into the high-quality canola varieties using embryo rescue, DH production, micro-propagation, and genetic marker-assisted selection from different Brassica species
- Developing genetic markers for using in Marker Assisted Selection
- Introgression of clubroot resistance genes into the high yielding rapeseed with higher oil quality

**KEY ACCOMPLISHMENTS**

- Disease evaluation and Detect genetic resources of clubroot resistance in indigenous and external *Brassica* species gene pool.
- Practical experience with plant tissue culture, ovule culture, embryo rescue and genetic markers application
- Analyzing and interpreting research results and setting the direction for research projects.
- Identification of the disease resistance genes through fine and genome-wide association mapping using genome sequence information and genome sequence.
- Develop and evaluate segregating populations (F2, F3, DH, test hybrid etc.) for advanced generations and their parents.
- Molecular marker development for Molecular breeding and marker-assisted selection for desirable traits
- Plant tissue culture and embryo rescue
- The breeding responsibilities are on the field, greenhouse, and laboratory
- Using JoinMap, IciMapping and Windows QTL cartographer, Plink, Structure and tassel packages for mapping and QTL and QTL analysis
- Supervise and train graduate students and visiting fellows
- Detect genetic resources of clubroot resistance in indigenous and external Brassica species gene pool.
- Identification of the disease resistance genes through fine and genome-wide association mapping.
- Introgression of clubroot resistance genes into high yielding canola with higher oil quality.
- Screened high yielding canola for desirable seed quality traits including linolenic, oleic and erucic acids using gas chromatography glucosinolate acid, protein and oil content using NIR (Near Infrared Reflectance) spectroscopy.
- Develop and evaluate segregating populations (F2, F3, Doubled haploid, etc.) for advanced generations and their parents.
- Hybrid seed production

**UNIVERSITY OF GUELPH – PLANT AGRICULTURE DEPARTMENT,** Guelph, Ontario 2007 –2015

***Research Assistant***

*Strategically assessed and recorded the genetic diversity in selected North American common bean genotypes for different desirable traits including seed yield and quality, nitrogen fixation ability, biotic and abiotic stress resistance in different environmental conditions.*

**KEY ACCOMPLISHMENTS**

- Observed the performance and overall seed yield stability of bean genotypes in different environments.
- Detected QTL for seed yield, light interception, chlorophyll content, symbiotic nitrogen fixation, drought tolerance, seed quality (protein and oil content), and their related traits and applied molecular markers and high-throughput sequencing to targeted genomic regions.
- Realized their heritability and expected genetic gain from selection for these traits.
- Identified and selected plants for breeding based on desirable traits and also based on the genetic variation.
- Detected most likely candidate genes conditioning symbiotic nitrogen fixation, light interception and seed yield in dry beans.
- Examined parents of existing soybean and corn mapping population for variation in dark-adapted leaf epidermal-conductance.

- Characterized the physiological basis of limitations to photosynthesis in commercial soybean cultivars during recovery from a transit sever water stress event.
- Examined Canola seed maturity, seed viability, and seed protein and oil contents.
- Crossed plants to create new breeding materials for field and growth-room assessments
- Experienced with vertical hydroponic system
- Experienced in DNA and RNA extraction

**AZAD SHIRAZ UNIVERSITY – PLANT PHYSIOLOGY/GENETICS DEPARTMENT,** Shiraz, Fars 2000 – 2007
***Instructor – Researcher***

**KEY ACCOMPLISHMENTS**

- Conducted various researchs for breeding plants with low tolerance levels to drought and salinity tolerance and water lodging in wheat, maize, and annual alfalfa
- Assisted in the categorization of similar breed with minor differences in genes
- Prepared and shared reports of all crossbreeding projects conducted in the laboratory
- Delivered presentations at press conferences and other events
- Trained interns and assisted them in documenting research results
- QTL & isozyme discovery for different traits

**PROFESSIONAL AFFILIATION**

- Member, CSACSHS
- Member, ASA-CSA-SSSA
- Member, Bean Improvement Cooperative (BIC)
- Member, National Association of Plant Breeders (NAPB)

**SELECTED PUBLICATIONS**

Farid, M., and H. Rahman. 201?. Genome-wide Association Study of Resistance to Clubroot Disease in *Brassica oleracea* L. PLOS One, Internal review

Farid, M., R. Stonehouse, K.E. Bett, I. Rajcan, K. P. Pauls, and A. Navabi. 201?. Quantitative trait loci for symbiotic nitrogen fixation and related traits in common bean (*Phaseolus vulgaris* L.). Plant Genome, Internal review

Farid, M., H. J. Earl, and A. Navabi. 2017. Response to selection for improved nitrogen fixation in common bean (*Phaseolus vulgaris* L.). Euphytica. 213:99-123.

Farid, M., H.J. Earl, and A. Navabi. 2015. Yield stability of dry bean genotypes across Nitrogen fixation dependent and fertilizer dependent management systems. Crop Sci 56:173-182.

Farid, M., and A. Navabi. 2015. $N_2$ fixation ability of different dry bean genotypes. Can J Plant Sci. 95(6): 12431257.

**SELECTED INTERNATIONAL AND REGIONAL MEETINGS**

Farid, M., R. Khanal, R. Stonehouse, H. J. Earl, K. P. Pauls, Benjamin Ellert, K. E. Bett, and A. Navabi. 2014. Inheritance of symbiotic nitrogen fixation in common bean. CSA-CSHS Conference, Lethbridge, Alberta, Canada (Oral presentation).

Farid, M., R. Khanal, W. Xie, R. Stonehouse, H. J. Earl, K.P. Pauls, K. Bett, and A. Navabi. 2013. Quantitative trait loci analysis of symbiotic nitrogen fixation in common bean. Bean Improvement Cooperative (BIC) Meeting, Portland, Oregon, USA (Poster presentation).

Farid, M., W. Xie, R. Stonehouse, K.P. Pauls, K. Bett, and A. Navabi. 2012. Quantitative trait loci analysis of symbiotic nitrogen fixation in common bean. Ninth Canadian Pulse Research Workshop, Niagara Falls, Ontario, Canada (Oral presentation).

Farid, M., H.J. Earl, I. Rajcan, K.P. Pauls, and A. Navabi. 2011. Quantitative variation in nodulation potential in an inbred line population of dry bean. Bean Improvement Cooperative (BIC) Meeting, San Juan, Puerto Rico, USA (Poster presentation).

Farid, M., H. J. Earl, I. Rajcan, K. P. Pauls, K. Bett, and A. Navabi. 2011. A study of nitrogen fixation ability of different dry bean genotypes. Bean Improvement Cooperative (BIC) Meeting, San Juan, Puerto Rico, USA (Poster presentation).
Farid, M., K. P. Pauls, and A. Navabi. 2011. A Study of $N_2$ fixation ability of different common bean genotypes in Ontario. Plant Canada Conference, Halifax, Nova Scotia, Canada (Poster presentation).
Farid, M., and H.J. Earl. 2010. Effects of drought stress on water use efficiency and component limitations to photosynthesis in soybean. The annual meeting of American Agronomy Society, Long-beach, USA (Oral presentation).
Farid, M., and H.J. Earl. 2009. Traits related to water use efficiency in soybean (*Glycine max* L. Merr.) – do greenhouse screen. Canadian Society of Plant Physiologists Eastern Regional Meeting, University of Guelph, Guelph, Ontario, Canada (Poster presentation).
Farid, M., R. Khanal, R. Stonehouse, H. J. Earl, K. P. Pauls, Benjamin Ellert, K. E. Bett, and A. Navabi. 2014. Inheritance of symbiotic nitrogen fixation in common bean. CSA-CSHS Conference, Lethbridge, Alberta, Canada (Oral presentation).
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