# CSA Newsletter

**Canadian Society of Agronomy** **May 2010**

## PRESIDENT'S MESSAGE

Dear members,

As Agronomists we have two things to be proud about – we are scientists helping to better mankind and we are agriculturists helping to better mankind. I think those of us who grew up in the city feel especially proud of being agriculturists and those of us who never won at a science fair (and who took up science just to show 'em) are especially proud of our participation in science.

I recall the CTV 'W5'crew filming at Agassiz Research Centre about 10 years ago because they got wind that we had 'talking' tomato plants and chicken coops furnished with toys. These were celebrities and we marvelled at their work- all day long, maybe 12 hrs, for a 5 minute clip. What I recall most from that day is, on a short break, reporter Elliot Schiff sighing perhaps with a hint of envy –"you guys really discover stuff!"

Yes, we discover stuff that feeds people. Even to safeguard our children. Noble indeed!

So why are we not the rock stars we ought to be and why isn't our life easier? And most grating for me, personally, is where is the respect? Do you know the line from the film "Desperately Seeking Susan" with Madonna when at a party the hostess points out Dr. So-and-So to an interested girlfriend but adding that he was just a dentist? "Well at least he is not a PhD", came the reply. I laughed!

The reality is that in our interwoven world all professions and all jobs are important. We need them all – even the lawyers (now they are in the family). In India I was so annoyed by the young men everywhere hawking stuff until it occurred to me that the toiling carpet weavers were really depending on these guys. We need steady water testers and we need gutsy pilots. We need musicians and poets and farmers. Our feeling of pride is most of all a personal one.

These are my reflections which I wouldn't bother you with. Except to say that while we draw strength from our conviction in our work, we need to start anew each day to explain with patience to people what we do, why we do it, and why they may need us around more than they think. And we should do it with utter respect for every other equally important occupation, if we want to be heard.

We have much to celebrate: an exciting conference in the heartland of agronomy, a new statistics workshop, for the first time accessible to all our members by Webinar; and great new executive members. We have two new Distinguished Agronomists, two new Fellows, and after many years, a winner of the Young Agronomist Award. And for the first time, an award to the authors of the 'best paper in agronomy' in our Canadian Journal of Plant science'; the winner will be giving a an invited keynote talk on their research at the upcoming meeting of the CSA. And we have an incredible crop of dynamic students- just check our Newsletters. On behalf of the 2010 CSA exec, I thank all of our members and all other agronomists out there for their daily work and contributions to mankind for which we can all truly feel doubly proud.

*Shabtai Bittman*
*President*

## Distinguished Agronomist

## Dr. Ron DePauw

The Canadian Society of Agronomy is pleased to confer the title of Distinguished Agronomist to Dr. Ron DePauw. Dr. DePauw has developed or co-developed over 50 wheat cultivars some of which have had over 20 years longevity. AC Barrie was the most widely grown CWRS cultivar for seven years and Lillian was most widely grown for the past three years. For the past ten years over 50% of all of the wheat grown in Canada derives from cultivars that he and his team developed. Dr. DePauw's 180 research publications with SPARC, other Canadian and international colleagues and his promotion to the highest category of research scientist in AAFC within 19 years of his PhD attest to his productive research career. His publications span the areas of agronomy, cereal chemistry, genetics, molecular genetics, pathology, physiology, and plant breeding.

Many of his new cultivars of hard red spring wheat have shifted the negative correlation between grain yield and protein concentration. The rapid adoption of his cultivars by producers attests to their on-farm value as producers are paid for both grain and protein. Dr. DePauw also demonstrated that the association of white seed coat color and susceptibility to preharvest sprouting could be broken. He developed white seed coat color germplasm lines and several cultivars which have resistance to preharvest sprouting.

Many of his varieties such as AC Barrie, Carberry, Infinity, Laura, and Muchmore have increased gluten strength relative to the standards Neepawa and Katepwa which meets an industrial processing improvement requested by our customers. Many of these cultivars have high flour yield and bright flour color which makes them valuable as milling wheat cultivars. Ten of his cultivars became standards or checks in one or more of the national registration trials. Not only have these cultivars met the requirements for eligibility for market grades of CWRS, but AC Barrie, AC Elsa, and Infinity have become part of a unique identity preserve program. Warburton's Ltd, UK, purchases 40 to 60% of its entire flour ingredients based primarily on five Canadian CWRS cultivars. Warburton's pays a premium to CWB and to farmers to be able to specifically select production of these varieties.

All of the cultivars developed continue to express resistance to the most potentially damaging disease, stem rust. Almost all of the cultivars at their time of release were resistant to prevalent races of leaf rust. Common bunt has been controlled genetically by the use of genes that derive from Thatcher, Hope and H-44. However, Ron and his team have deployed new genes such as Bt10 (AC Karma and AC Cadillac) and recently Bt11 (Snowbird476).

All solid stem cultivars which confer some resistance to the wheat stem sawfly for the past 25 years have derived from cultivars breed in DePauw's program. The solid stemmed Lillian, released in 2003 as a joint project with colleagues at Cereal Research Centre Winnipeg, represent a major increase in grain yield and protein content. Lillian is one of the first widely grown cultivars in the world to deploy the gene, Gpc-B1, linked to the yellow rust resistance gene Yr36.

The Canada Prairie Spring-Red (CPS-R) and Canada Prairie Spring-White (CPS-W) classes were established to diversify the product mix that the Canadian Wheat Board had available to penetrate emerging international markets. By 1991, the class had grown to become the third largest Canadian wheat class. From 50 to 100% of the CPS-R and CPS-W acreage were sown with cultivars developed by the DePauw and the SPARC team.

## Distinguished Agronomist

## Dr. Gordon Rowland

Dr. Rowland began his breeding career in 1971 at the Crop Development Centre (CDC) with a focus on faba beans as part of the CDC's mandate to develop new crops for Saskatchewan farmers. Dr. Rowland added flax to his portfolio in the mid 1970s as a result of a request from the Flax Growers of Western Canada that the CDC mount a flax breeding program for the prairies. Up to that time the varieties which were commonly grown had not been developed for the western prairies with its unique short season and need for high yielding varieties which were earlier maturing and with shorter stature and stronger lodging resistance.

Dr. Rowland's first flax variety release was Vimy in 1986. This variety was noted for its large seed, which gave it two advantages – it germinated and grew well under dryland conditions in southern Saskatchewan, and its large seed made it a desirable food type flax. It was the release of Vimy which started the growth in acreage in Saskatchewan in the 1990s (Figure 1). Vimy continues to be produced to this day.

A number of other varieties have been released over the past two decades (Table 1), with the result that for the past decade Dr. Rowland's varieties are today grown on close to 80% of the flax acres in western Canada (Canadian Grain Commission Harvest Survey). Notable varieties with respect to market share include Vimy, Somme, Flanders, CDC Normandy, CDC Bethune, and CDC Sorrel. It is estimated that the contribution of Dr. Rowland's program to western Canadian farm-gate income in the last half of this decade averages $155 million per year.

Dr. Rowland's approach throughout his career has been one of innovation. Dr. Rowland has been an early adopter of new breeding tools. Single seed descent is commonly used in his program, as is the half seed technique.

Dr. Rowland introduced a mutagenesis program in the late 1980s to develop the low linolenic attribute. Up to that time flax was primarily an industrial oilseed, used in paint and linoleum manufacture. Its unique oil character lent itself to industrial uses where coating and drying were important factors. However, its high linolenic acid profile meant that the oil would go rancid very quickly. The low linolenic attribute was seen as opening up the possibility for flax to become an edible oil product. The character was found and fixed in the germplasm, and utilized in a backcrossing program to bring it into elite germplasm. However, modifying oil profile can affect other characteristics of the seed, and it was found that the low linolenic character decreased germination success; so it was some time before the first low linolenic variety with good agronomic characters was released (CDC Gold).

Dr. Rowland has been a strong advocate of the use of mutagenesis to bring new variation into his program. Recently Dr. Rowland has worked closely with molecular geneticists to develop mutagenized recombinant inbred line populations in order to find and fix new attributes.

Dr. Rowland has been an early researcher and adopter of genomics as a tool for plant breeding, and his leadership in genomics studies was recognized in April 2009 by the awarding of an $11 million grant from Genome Canada to a consortium of scientists and plant breeders led by Dr. Rowland (the TUFGEN project), to utilize our knowledge of the flax genome and move it forward to practical tools to be used in gaining efficiency in plant breeding and variety development for food, industrial and fibre utilization. This project includes scientists in Canada, the United States, Europe and Asia.

In addition, Dr. Rowland has long been involved in a research agreement with Parsons Seeds to develop short season flax varieties for northern Europe. Examples of varieties released in Europe include Lola and Sunrise.

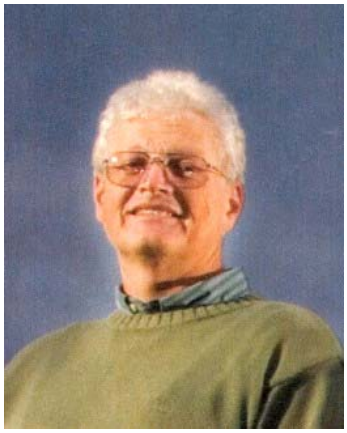
Dr. Rowland has supervised and/or acted on the graduate committee for a number of Masters and PhD candidates throughout his career. Dr. C.P. Andrahennadi (Viterra), Dr. E. Tuomola (SW Seeds and now Boreal, Finland), Dr. R. Graf (Saskastchewan Wheat Pool and now Agriculture & Agri-Food Canada), and Dr. C. Ntimaioh (World Wide Wheat) are all plant breeders and/or research managers who did their graduate work under Dr. Rowland.

# CSA Fellow

# Dr. Guy Lafond

The Canadian Society of Agronomy is pleased to confer the title of Fellow to Dr. Guy Lafond. Dr. Lafond is a Research Scientist with the Agriculture and Agri-Food Canada Semi-arid Prairie Agricultural Research Centre (SPARC), in Indian Head, Saskatchewan. He has led a multi-disciplinary research program across many centres addressing issues related to the agronomy of no-till, cropping systems, precision farming, cereal, oilseed, pulse and special crop agronomy, soil, fertilizer and land management. During the past 25 years, he has conducted research in many areas and following are some highlights of his research activities:

1. Development of conservation tillage production systems for the Parkland region of the Canadian Prairies and refinements to crop production techniques to enhance the agronomic and economic opportunities of no-till systems. This research, conducted at a variety of locations in southeast and east central Saskatchewan, has had a significant impact on the adoption of conservation tillage practices in the semi-arid and sub-humid regions of the prairie grain growing region. The impact was documented in scientific publications, extensive technology transfer activities, and the farm press.
2. Quantifying the role of winter cereals for enhancing sustainable crop production systems for the Parkland areas of the Prairies. Winter cereals have struggled to find a long-term fit in prairie production systems, even though the management practices for production have been well documented by research in Dr. Lafond's program.
3. Understanding basic principles of agro-ecosystems function and performance relying on various long-term field studies. Dr. Lafond has gained a strong understanding of the role and impact that long-term field studies can have on our understanding of cropping systems management. His work in long-term no-till management is an excellent example of this.
4. Development of technology transfer models to accelerate the adoption of conservation tillage production systems. Guy has worked extensively with provincial extension agencies and non-governmental groups to build technology demonstration programs.
5. Specialized Crops Research through the Canada-Saskatchewan Agri-Food Innovation Fund to promote the adoption of various specialized crops like pulse and spices into no-till production systems. The extensive network of trial sites across Saskatchewan provided good evidence of where most of the special crops could be grown successfully.
6. Enhancing flax production and quality by quantifying the impact of agronomic practices. Dr. Lafond led a prairie wide project which established proper agronomic management for high yielding flax production.
7. New Approaches to Land Management involving the use of Precision Farming techniques and more recently the investigation of optical sensors to refine our ability to manage nitrogen fertility and account more accurately for spatial and temporal variability. This recent research and development work has provided strong support to the ongoing effort to improve nutrient use efficiency across the variable landscapes of the three prairie province.
8. Fine Tuning No-till seeding systems with the investigation of various side-banded openers. Dr. Lafond provided leadership and support to a network of research and development activities which ultimately validated the use of anhydrous ammonia when no-till seeding, as well as proper placement of dry and liquid fertilizer sources.
9. The Impact of Tillage/Cropping Systems on Production, Pest Management, Soil Health, Economic and Energy Performance. Guy's work has gone beyond verifying the impact of no-till seeding systems on crop production, with research contributions supporting the economic, energy performance and soil quality changes which have been captured as well.



## CSA Fellow

## Dr. Malcolm Morrison

The Canadian Society of Agronomy is pleased to confer the title of Fellow to Dr. Malcolm Morrison. Dr. Morrison is a research scientist working in crop physiology and agronomy at the Eastern Cereal and Oilseed Research Centre of Agriculture and Agri-Food Canada, in Ottawa. He has had a strong impact on agronomic science in Canada and internationally. His research has resulted in important findings in the physiology of soybean, canola, corn and wheat crops. His recent work on isoflavone concentrations in soybeans have garnered attention in both scientific and popular media.

Dr. Morrison has an exceptional ability to communicate scientific concepts clearly to students, producers, industry colleagues and the general public, both orally and in writing. He has served as keynote speaker at conferences, and is the "go-to-guy" for radio and television reports on research conducted at the Central Experimental Farm.

Dr. Morrison's communication skills in linking industry needs with research capabilities have been valued by the Canadian Soybean Export Association (CSEA), as evidenced by Dr. Morrison's role on two extensive trade missions to Asia in 2001 and 2004.

Dr. Morrison served as science advisor on the canola display for the Canadian pavilion at the Seville Worlds Fair in 1992. He furnished the picture used for the 1999 stamp commemorating the discovery of Marquis wheat by Sir Charles Saunders. In 2002, he was Technical Advisor for the Royal Canadian Mint in the development of a $100 gold coin celebrating the 100$^{th}$ anniversary of the selection of Marquis wheat. The coin was released in February 2003. More recently in 2008, Dr. Morrison wrote an article for Genome, on Sir Charles Edward Saunders, the Dominion Cerealist (Genome51:465-469), providing a historical perspective to the well-known breeding accomplishments.

Dr. Morrison's research has resulted in innovations that have had an impact on the research community and the agriculture sector. Examples include:

1. Investigation of the effect of plant pigments on soybean growth rate and yield identified a yield advantage for tawny pubescence colour in cool regions because of warmer canopy temperatures, while in warmer regions, grey pubescence will out-yield tawny lines because they are cooler, and have greater water use efficiency and a longer seed filling period.
2. Investigation of the role of population stress in soybean cultivar development revealed that modern cultivars are more tolerant of high populations than their predecessors. This research had implications for population density recommendations to farmers.
3. Development of a heat stress index during reproduction in Brassica species explained yield losses. Most canola models now include a heat stress factor and the Canola Growers Manual estimates annual heat stress days.
4. Measurement of crop reflectance was used to determine several features of plant growth and development and their correlation with yield. Further development of the technology is related to tractor mounted units being calibrated for on-the-go fertilizer rate adjustment.
5. A study of the cadmium content in soybean determined that many of the varieties grown and exported for food in southern Ontario had levels exceeding the proposed Codex standard. This work is in collaboration with a soybean breeding program to reduce the concentration of cadmium in Canadian food grade soybean.

## Young Agronomis
## Dr. Curtis Pozniak

Crop Development Centre,
Department of Plant Sciences
University of Saskatchewan

The Canadian Society of Agronomy is pleased to confer the title of Young Agronomist to Dr. Curtis Pozniak. Since his appointment seven years ago, Dr. Pozniak has built a world-class wheat breeding and genetics program at the University of Saskatchewan. He has established an impressive suite of populations and lines for genetic research that will continue to support the ongoing research productivity of his group and attract national and international collaborations. DNA markers developed for genes controlling key traits in wheat are being utilized by his research group and also by laboratories in Australia, Mexico, the USA and the EU. He has established and manages a state-of the-art molecular screening facilitiy that benefits not only his breeding program but that of others in the Crop Development Centre. He and his students and colleagues have published 20 scientific manuscripts since 2004. He has released his first two wheat cultivars which will be of economic benefit to western Canadian producers and the seed industry within a few years. His program has attracted multi-million dollars in funding from a variety of public and private agencies, with ten new grants received in 2009-10.

In his applied research, Dr. Pozniak manages a plant breeding program to develop improved durum and high yielding wheat cultivars adapted to the wheat growing regions of western Canada. His durum wheat program is now routinely screening molecular markers for the end-use quality traits, yellow grain pigment, cadmium concentration and lipoxygenase activity and for resistance to the disease Fusarium Head Blight (FHB) as well as for resistance to the orange blossom wheat midge and the wheat stem sawfly. He has given numerous invited talks at national and international conferences related to wheat genetics, genomics and production and has become recognized as an international leader in durum wheat genetics.

Dr. Pozniak's basic research program focuses on the isolation of genetic factors involved in the expression of important traits in his breeding program. In the first three years of his appointment, he developed mapping populations of recombinant inbred lines, fine mapping populations, near isogenic lines and several TILLING (Targeting Induced Local Lesions in Genomes) populations for reverse genetic and functional genomic studies.

Dr. Pozniak has been an associate editor of the Canadian Journal of Plant Science for five years and has done numerous manuscript reviews for a variety of national and international journals. He has carried out research grant reviews for NSERC, Agriculture and Agri-Fooda Canada and various provincial funding organizations. He is member of many national and international organizations, and has served as secretary or chair of two national organizations, and is presently the coordinator of the Western Canadian General Purpose Wheat Cooperative Trials. Dr. Pozniak was asked by the Canadian Seed Trade Association to be its representative at the International Seed Federation's Working Group on Molecular Markers for Variety Development and was elected Chair of the Canadian Wheat Improvement Network in 2008. The latter is a national network of wheat scientists from across Canada which meets annually to present findings and plan new projects.

Dr. Pozniak has taught undergraduate Plant Breeding and graduate Quantitative Genetics. In addition, he has given lectures in other courses, including annual lectures in Agricultural Economics (Follow the Grain). Dr. Pozniak has annually been involved in many extension activities, including talks and field and lab tours for industry partners, farm media and international visitors.

Dr. Pozniak is a remarkable scientist whose research has had a major impact on the way that plant breeding is done at the University of Saskatchewan and whose work has had global reach, being utilized in international wheat breeding programs.

## CSA Pest Management Research Graduate Student Award

## Mr. Umut Toprak

Mr. Umut Toprak is a Ph. D candidate working at the Agriculture & Agri-Food Canada Research Centre, Saskatoon, SK and in the Biology Department, University of Saskatchewan. His research is focused on developing alternative pest control strategies for bertha armyworm based on disruption of the insect's digestive physiology. Mr. Toprak has B.Sc (2000) and M.Sc (2004) degrees in Plant Protection from Ankara University, Ankara, Turkey. Throughout both of those degrees, he achieved overall grade point averages over 90%. His marks at the University of Saskatchewan are in the mid '80s. In 2003 and 2005 he spent brief periods working in labs at Christian Albrechts University in Germany and at Iowa State University, respectively. He began his PhD work in Saskatoon in 2006. He has received a number of awards from Ankara University, a second prize award for his poster in the virus division of the 39th annual meeting of the Society for Invertebrate Pathology, Wuhan, China (2006) and in 2008 he received the Arthur R. Brooks award from the Entomological Society of Saskatchewan. He has co-authored 12 refereed manuscripts (nine as first author) and has been involved in 13 international conference presentations (nine as first author).

# *Saskatoon 2010*

## *Transfers & Transformations: Our Evolving Biosphere*

### A joint meeting of the CSA and the CSSS

The 2010 CSA Annual Meeting will be held **June 20-24, 2010** in **Saskatoon, SK** in collaboration with the CSSS. It promises to be an outstanding meeting with symposia on organic agriculture and plant breeding, a plenary presentation by Gwynne Dyer, talks from international experts on soil chemistry, a Statistics Workshop, special graduate student activities and awards as well as an agronomy tour including a progressive Saskatchewan grain farm and the PCS-Allan potash mine.

Please check out the conference website for more information:
(http://www.usask.ca/saskatoon2010/Saskatoon2010/Home.html)

# SPOTLIGHT: University of Saskatchewan Students

In the next few issues, we will be highlighting students from different universities.
A more complete project description for each student will be included in the online version of the newsletter.


## Rohit Dhanda

M.Sc. candidate in
Plant Sciences (2008-2010)

University of Saskatchewan
Saskatoon, SK, Canada

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**Education:**

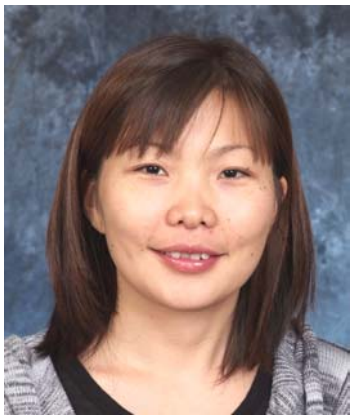
As a kid, I grew up on a farm near the national capital of India, New Delhi. My interest in agriculture motivated me to take under-graduate study in agriculture at CCS Haryana Agricultural University, Hisar (India), earning a B.Sc. in Agriculture degree in 2007. I arrived in Saskatoon, Canada in September 2008 and joined the department of Plant Sciences at College of Agriculture and Bioresources, University of Saskatchewan for M.Sc. in plant sciences. I am looking forward to complete M.Sc. during the summer 2010.

**Current Research:**

Oat is a very important crop for livestock feed and human nutrition. Increased interest in health promoting properties of oat has lead to a need to explore current oat germplasm for nutritional qualities. The study is conducted to explore the fatty acid profiles of diverse accessions from the world oat collection preserved in the Canadian national seed genebank, Plant Gene Resources of Canada (PGRC), at the Agriculture and Agri-Food, Canada Research Centre, Saskatoon, Saskatchewan, Canada. The accessions include a wide range of Avena sativa L. and other selected species from the genus Avena (A. byzantina, A. sterilis, A. fatua and A. strigosa). Based on initial results, selected accessions were grown in replicated field trials and re-analyzed to gain insights to the influence of the environment on fatty acid composition. The study also includes an experiment to explain the genetic base of the oat fatty acid profile using association mapping information. The understanding gained from this research has direct applications on improving the fatty acid profile of future oat cultivars for both food and feed using plant breeding.

**Future Vision:**

I see myself very interested in the area of plant breeding since I joined the agricultural studies. I would like to pursue a Ph.D. focusing on the crop quality while breeding cereal crops, using the knowledge I have gained in the area of agricultural research, in India and Canada.




## Tamira Delgerjav

M.Sc. Candidate in
Plant Sciences (2009-2011)

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**Education:**

B.Sc. in Plant Sciences, Mongolian State University of Agriculture UB, Mongolia

**Current Research:**

***Genotype by environment analysis of the performance of two low phytate pea lines.***

Approximately 60- 80% of the total phosphorus in most crop seeds is stored as phytate. Phytate phosphorus is not available to non-ruminants because of the lack of the phytase enzyme. Low phytate crops have recently been developed which lead to better availability of phosphorus and micronutrients in food and feed. The objective of this study was to conduct field trials at three locations in Saskatchewan to compare the phytate content and agronomic characters of two low phytate field pea lines, 1-2347-144 and 1-150-81, with CDC Bronco, the parent variety from which they were derived and 20 other widely grown varieties. Lines 1-2347-144 and 1-150-81 were found to display the low phytate trait at all three locations, while all of the other varieties tested displayed the normal phytate trait. In the field analysis, the low phytate lines had similar seedling emergence counts, days to flowering, days to maturity, vine length, lodging score, powdery mildew score, mycosphaerella blight score and grain yield compared to CDC Bronco. In the laboratory experiment, the low phytate pea lines had substantially higher inorganic phosphorus than CDC Bronco and other normal phytate lines. Furthermore, low phytate lines showed that there was correspondingly lower amount of phytate than CDC Bronco and the normal phytate lines.

**Future plan:**

The research will be continued in 2010 to show the performance of two the low phytate lines. I expect the research might show the clear result of lowering phytate level in pea crop that will benefit from further research. I plan to graduate in spring of 2011.


## Abdi Ketema Daba

PhD Candidate in
Plant Sciences, (2009-2012)

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Saskatoon, SK, Canada

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**Education:**

B.Sc. in Plant Sciences (2001), Debud University, Awassa College of Agriculture, Awassa, Ethiopia.
M.Sc in Plant Breeding (2007), Haramaya University, Dire Dawa, Ethiopia.

**Current Research:**

***Exploiting Response to Photoperiod to Improve Adaptation and Yield of Chickpea in the Canadian Prairies***

To achieve optimum yield in chickpea, crop duration must closely match the available growing season. Crop duration especially timing of flowering is modulated strongly by genotype, temperature and photoperiod. Morphological characters affecting phenology in chickpea have been reported, however, no response to photothermal factors, nor the location of genes responsible for the response have been reported in chickpea. This research has three components:

1. Preliminary screening of responses of chickpea germplasms to photoperiods Objectives: 1) to examine the responses of diverse chickpea genotypes grown with either long or short days, and 2) to examine the responses of selected chickpea genotypes grown in a range of thermal regimes combined with either long or short days.
2. Determination of photoperiod sensitive phases Objectives:1) to determine timing and duration of the photoperiod-sensitive phase and the time of floral initiation in selected chickpea genotypes representative of the different maturity classes, and 2) to establish whether photoperiod sensitivity ends at floral initiation or if it extends further into the phase of flower development.
3. Mapping genes for early flowering, photoperiod insensitivity and reaction to ascochyta blight Objectives: 1) To determine the genetic basis of the association between flowering time and resistance to Ascochyta rabiei, with a specific objective of mapping the chromosomal regions that control flowering time, days to maturity, photoperiod sensitivity and resistance to ascochyta blight in chickpea.

The results of this research will provide a better understanding of the genetic and environmental control of flowering time and earliness and their interactions with disease resistance in chickpea. Such results will assist breeding of high yielding varieties specifically adapted to Western Canadian environments.

**Future plan:**

I plan to Graduate in the spring of 2012, and would continue research focusing on identification of desirable traits for the improvement of chickpea production to help the farmers who want to benefit from the results.


## Yong Liu

M.Sc. Candidate in
Plant Science (2009-2012)
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**Education:**

B.Sc in Horticulture FuJian Agricultural and Forestry University, FuJian, China
B.Sc in Plant Science, Nova Scotia Agricultural College, Truro, NS, Canada

**Current Research:**

***QTL mapping of mycosphaerella blight resistance, lodging resistance, and selenium concentration in the Carrera/CDC Striker recombinant inbred line population***

Field pea production in western Canada is negatively affected by lodging and several fungal diseases, among which 90% of the disease damage is caused by mycosphaerella blight [Mycosphaerella pinodes (Berk. and Blox.) Vestergren]. Complete resistance to mycosphaerella blight is lacking in field pea germplasm, so it is a major goal to breed resistant cultivars. Breeding for lodging resistance is important in order to increase yield and facilitate harvest. In addition, Canadian field peas are rich in selenium (Se) and field pea cultivars grown in Saskatchewan displayed a moderate level of variation in Se accumulation. Thus, it is important to determine the genetic control of Se accumulation in pea so as to market Canadian peas for nutritional benefits.

The objective of this study is to determine the genetic control of mycosphaerella blight resistance, lodging resistance and selenium micronutrient density in pea by genotyping and phenotyping a recombinant inbred line population segregating for these traits. This research focuses on Carrera/CDC Striker recombinant inbred line (RIL) population. A total of 150 RIL plus parents will be phenotyped in field studies over two years including assessments of mycosphaerella blight, lodging, days to flower, days to mature, grain yield and seed selenium concentration. Genotyping will be analyzed using SSR and AFLP markers.

**Future vision:**

I plan to graduate in February 2012. I plan to work further on the traits of field pea to enrich my experience and expand my vision as well.

## Other Graduate Students Carrying Out Agronomy-Related Projects in the Plant Sciences Department at the University of Saskatchewan.

| *STUDENT NAME* | *SUPERVISOR* | *PROG* | *START* | *PROJECT* |
|---|---|---|---|---|
| ANDERSON, Jay | Shirtliffe | MSc | Sep-09 | Control and invasiveness of the weed White Cockle |
| BENARAGAMA, Dilshan | Shirtliffe | MSc | May-08 | Development of a competitive oat cropping system against weeds |
| ELSADR, Hanny | Bett | MSc | Sep-08 | Condensed tannin accumulation and seed coat darkening in beans |
| FRIMPONG, Adams | Chibbar | PhD | May-05 | Genetics of starch in chickpea (*Cicer arietinum L.)* |
| LIN, Yang | McCartney | MSc | Sep-09 | Genetic analysis of crown rust resistance in oat |
| MARTINEZ, Joce | Bett | MSc | Sep-05 | Sub-zero temperature tolerance in *Phaseolus acutifolius and hybrids* |
| MATLOCK, Erin | McCartney | MSc | Jan-08 | Genetics of *Stagonospora nodorumresistance in wheat* |
| NANDY, Sushmita | Rowland | PhD | Jan-05 | The identification of flax stem fibre genes by tilling |
| UBAYASENA, Lasantha | Warkentin | PhD | Sep-05 | Improving the value of field peas for human consumption markets |
| VAIL, Sally | Vandenberg | PhD | Sep-05 | Deciphering resistance to anthracnose in lentil |
| WARD, Warren | Vandenberg | MSc | Sep-05 | A lodging protocol for lentil breeding |
| ZAKERI, Hossein | Bueckert | PhD | May-06 | Growth, yield and nitrogen partitioning of lentil reduced indeterminacy |
| ZATORSKI, Thomas | Rossnagel | PhD | Sep-04 | Phenolic compounds with antioxidant activity in oat and barley |
| ZHANG, Tao | Booker | MSc | May-10 | Characterization of flax core collections |

# CSA EXECUTIVE


**PRESIDENT**

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