Manitoba Pulse Growers Association www.manitobapulse.ca

pulse beat

Spring • No. 65, 2012

SOY AND GRAIN TRADE SUMMIT

Canadian Soybean Council – *page 14*

THE RETURN OF EDIBLE BEANS

Field of Vision – *page 37*

Focus on RESEARCH Continues

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pulse beat

Manitoba Pulse Growers Association

Spring • No. 65, 2012

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Manitoba Pulse Growers Association thanks the authors who have taken the time to contribute to this publication.

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Please direct your comments or concerns to Monika Robertson at 204.745.6488 or email monika@manitobapulse.ca

In this Issue

Andrew Saramaga
President

At the start of each new year in agriculture you will find producers alike taking in all the tradeshows and events to gather information for the new season. Manitoba Pulse Growers (MPGA), along with the National Sunflower Association of Canada, Manitoba Corn Growers and Manitoba Agriculture, Food and Rural Initiatives have just wrapped up a successful sixth annual Special Crops Symposium held at a new location in 2012. We believe this was the largest attendance yet and look forward to your feedback on this event. The same associations held our second annual Special Crops Production Day in Brandon to bring the same knowledge gained at symposium to our producers on the western side of the province.

At the end of January, I had the opportunity to travel with fellow board members to Farm Tech in Edmonton. Farm Tech is Western Canada's premier crop production and farm management conference and brings together the commodity groups in Alberta for a three-day packed show. Sessions included federal agriculture policy information with Richard Phillips from the Grain Growers of Canada, farm management tips, Twitter and tech tricks and a weather outlook from Drew Learner. There were multiple keynote addresses including award-winning comedian Gerry Dee for the Wednesday banquet, an address from General Rick Hillier, former Chief Defense Staff Canadian Armed Forces plus a very interesting session about agriculture in Ukraine from John Shmorhun.

I hope you were able to take in a few of these important shows in Manitoba or out of province and that you gained valuable information to make your 2012 production year successful.

As I reach the end of my term as president of the association, I'd like to thank the directors I've had the opportunity to serve with, and to learn from. I encourage any member of the association who would like to learn about the organization to speak to a current or past director about their time on the board. I will be staying on as past-president for 2012 in order to provide the proper transition for the board.

When I got involved with the MPGA as an elected director in 2006, I was looking for an opportunity to work with and for other pulse producers in Manitoba. I very quickly saw the large growth potential for MPGA and was able to learn from the other seasoned directors on the board. Being on the board has given me the opportunity to communicate with other like-minded members in the pulse industry and partner with the various associations in Manitoba and other provinces in Canada on initiatives relevant to our producers.

Over the last few years, I have seen the board gain young, smart and energetic directors – this sets us apart. Our board is run by the next generation of farmers, as they set out to take over their family operations, they are here to work for their industry.

MPGA has had a successful year accomplishing portions of its strategic three to five-year plan set out in December 2010 and we look forward to achieving the remainder of our strategic plan in the coming years. There are many initiatives to work on including: increased contributions to MPGA research accounts, more matching contributions with government funding, continued support of Pulse Canada and the Canadian Soybean Council's initiatives, more local and domestic promotion of the health benefits of pulses through tradeshows and events, plus continued professional development for staff and board members.

Good luck this season!

Roxanne Lewko
Executive Director

Going into 2012, MPGA is quite optimistic. Soybeans acres are set to increase again, and we will gain back some of the edible bean and pea acres we lost in 2011. As long as Mother Nature is nice to Manitoba farmers this year, we are expecting a successful growing season.

MPGA held our annual industry meeting on December 13th in Winnipeg. We pushed back the date this year so we could discuss our 2011 Pulse Variety Evaluation insert, and we were very pleased with the turnout. Some great suggestions came forward on improvements we could make into 2012 and beyond. It is nice to see how much value is placed on our variety insert and how much the industry and farmers respect the data it generates. MPGA would like to thank our industry reps for their constructive feedback. We appreciate hearing what they have to say, and we are always striving to do things better and more effectively.

Our office received several research proposals through our Call for Research Proposals put out in October. Each crop committee met to review their respective proposals and brought recommendations to the board on which ones we should be funding. The board's decision to fund is based on sound science, importance and relevance of the project to Manitoba farmers and the entire pulse industry, and funding requirements. MPGA is committed to funding great projects that bring value to our members. Based on the success of the field-scale trials in 2010 and 2011 and being viewed as incredibly valuable, the number of trials being funded in 2012 has increased. A new undertaking for 2012 is working with Tone Ag Consulting out of St. Pierre to develop a *Soybean On-Farm Network*, similar to what has been successfully developed in Iowa. We are starting out small in 2012 and hope to expand from there, depending on the results.

Another new research project we are commencing in 2012 (if our grant application is successful) involves forming a partnership with Agriculture and Agri-Food Canada (AAFC) and Manitoba Agriculture, Food and Rural Initiatives (MAFRI). AAFC announced a funding program in November: the Agricultural Innovation Program. It is a one-year program where AAFC will match funding at a 3:1 ratio for research projects that accelerate the creation, availability, application and transfer of knowledge and technologies to the sector, or increase the successful

continued on page 4

continued from page 3

commercialization or adoption of agriculture, agri-food and agri-based innovations. MPGA saw this as an opportunity to bring AAFC and MAFRI together and collaborate on soybean research, particularly in the non-traditional growing areas where soybeans are being experimented with, such as Arborg, Roblin, Melita and Carberry. MPGA submitted our AIP application in early February and should receive confirmation of approval by the time this publication goes to print. We have heard that our application will be favourably received, so we are hopeful. Success with this AIP project is a nice lead into the new Growing Forward II funding framework, which begins in April 2013.

MPGA had the opportunity to meet with the new Minister of Agriculture, Food and Rural Initiatives, Honourable Ron Kostyshyn, on February 21st. We discussed the sort of vacant Pulse Specialist position (Dennis Lange began as the Farm Production Advisor out of Altona on January 3rd) and the urgency to get it filled, the importance of public research and our displeasure of less government funding going into research each year, our opposition on the potential cosmetic pesticide ban, and crop insurance concerns including the 15% deductible on unharvested crops and getting soybean coverage in the Grandview/Gilbert Plains/Roblin areas. MPGA will be meeting with Manitoba Agricultural Services Corporation (MASC) on March 13th to discuss those crop insurance items with them as well.

The Pulse Industry Roundtable (PIRT) met in November for a brainstorming session, where new ideas and opinions for the PIRT mandate were discussed, as well as identification of priority work areas, agenda setting and membership issues. It was a very productive session and the facilitator did a great job of capturing it all. A draft discussion paper was circulated for feedback and another meeting is being held at the end of February to review and finalize it. Themes for PIRT to concentrate on were developed. They include: competitive intelligence, communication, market development, sustainability and profitability, adding value, and research. Various projects were suggested and discussed, and prioritization of those will offer a focused approach and direction going forward.

MPGA once again shared a booth at Ag Days with the Manitoba Corn Growers Association and the National Sunflower Association of Canada. All three groups find it a great place to promote our Special Crops Symposium and the Special Crops Production Day. There was lots of interest from farmers in both events.

You may have noticed that MPGA was advertising a 12-month term Executive Director position. Dean and I are expecting our first child in April, and I will be going on maternity leave. We are pleased with the applications we have received and are hoping to have a replacement begin in March, so there is some overlap before my last day. It is a difficult position to take on temporarily, but we are a growing association, so it is important that someone steps in and keeps things moving forward. Of significant importance in 2012 will be the preparation of another Pulse Science Cluster and Soybean DIAP (or possible Cluster) application for the new Growing Forward II funding.

MPGA wishes you a great spring and ideal seeding conditions! All the best this coming crop year!

Important Notice

Revisions have been made to the original Soybean Variety Trial data published in the *2011 Pulse Variety Evaluation* and distributed with the fall/winter 2011 edition of *Pulse Beat*.

Changes are as follows:

- Check yields of NSC Portage RR and OAC Prudence, along with the CV% and LSD% were stated incorrectly. (pages 11 and 13)
- LS006R21 should not have been included in the Beausejour, Arborg or Stonewall sites. The correct yield (% check) for LS006R21 is 107%, not 104%. (page 12)
- Heat unit for LS006R21 is 2475.
- Yield for NSC Warren in Roblin is 68 bu/acre, not 83 bu/acre. (page 10)

Updated tables can be reviewed on our website – *www.manitobapulse.ca*

MPGA apologizes for any problems related to these errors.

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STATEMENT OF OPERATIONS – ADMINISTRATION FUND
FOR THE YEAR ENDED DECEMBER 31, 2011

	Budget 2011	2011	Restated 2010
REVENUE			
Administration fee (note 3)	$ –	$ 10,355	$ 7,568
Advertising rebate	–	10,000	–
Check-off	895,000	1,287,203	868,350
Interest	18,000	26,788	11,096
Miscellaneous	–	200	–
Pulse Tour	1,000	1,200	1,000
Promotions	–	–	7,170
	914,000	1,335,746	895,184
EXPENSES			
Check-off refunds	45,500	54,119	32,111
Administration	50,700	49,051	54,467
Travel	62,950	79,413	56,013
Employees	164,200	153,696	130,787
Research	400,000	400,000	400,000
Market development	116,000	120,736	113,847
Member relations	39,500	47,757	36,712
Memberships	4,785	5,260	4,234
Special crops symposium	–	900	–
	883,635	910,932	828,171
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENSES	$ 30,365	$ 424,814	$ 67,013

STATEMENT OF OPERATIONS – RESEARCH FUND
FOR THE YEAR ENDED DECEMBER 31, 2011

	2011	Restated 2010
REVENUE		
Interest	$ 10,355	$ 7,568
Research support	400,000	400,000
Registration fees – Crop Diagnostic School	41,345	46,840
Seed trials		
– Pea co-op	60,690	65,520
– Soybean	69,242	35,600
Donations and grants	81,360	44,003
	662,992	599,531
EXPENSES		
Administration fee (note 3)	10,355	7,568
Administered projects		
– Crop Diagnostic School	51,381	41,768
– Pea co-op trials	63,810	62,400
Seed trials – soybean	68,654	39,853
Research projects	650,394	218,350
Unallocated expenses	2,844	2,299
	847,438	372,238
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENSES	$ (184,446)	$ 227,293

STATEMENT OF FINANCIAL POSITION
FOR THE YEAR ENDED DECEMBER 31, 2011

	Administration Fund	Research Fund	Total 2011	Total 2010
ASSETS				
CURRENT ASSETS				
Bank – unrestricted	$1,707,208	$ 534,678	$2,241,886	$2,004,908
Accounts receivable	10,355	–	10,355	7,568
Prepaid expenses	3,305	–	3,305	–
	$1,720,868	$ 534,678	$2,255,546	$2,012,476
LIABILITIES AND FUND BALANCES				
CURRENT LIABILITIES				
Accounts payable	$ 9,907	$ 10,355	$ 20,262	$ 17,560
FUND BALANCES				
Unrestricted	1,710,961	–	1,710,961	1,286,147
Restricted for Research	–	524,323	524,323	708,769
	1,710,961	524,323	2,235,284	1,994,916
	$1,720,868	$ 534,678	$2,255,546	$2,012,476

STATEMENT OF CHANGES IN FUND BALANCES
FOR THE YEAR ENDED DECEMBER 31, 2011

	Administration Fund		Research Fund	
	2011	2010	2011	2010
Fund Balances beginning of year	$1,286,147	$1,219,134	$ 708,769	$ 481,476
Excess (deficiency) of revenues over expenses	424,814	67,013	(184,446)	227,293
Fund Balances end of year	$1,710,961	$1,286,147	$ 524,323	$ 708,769

MPGA MISSION STATEMENT

To provide Manitoba pulse grower members with production knowledge and market development support, through focused research, advocacy and linkages with industry partners.

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Theresa Whalen
CFA Farm Safety Consultant

DEAR PRODUCERS AND FARM SAFETY ADVOCATES,

*Plan *Farm* Safety* is the theme of the three-year Canadian Agricultural Safety campaign. This year, emphasis is on *Safety* including assessment, improvement and further development of safety systems. Last year, the focus was on *Farm* including implementation, documentation and training. In 2010, the campaign promoted *Plan*, featuring safety walkabouts and planning for safety.

The yearlong *Safety* campaign will be launched with Canadian Agricultural Safety Week (CASW), from March 11 to 17. A complete media kit with cartoons and photos is available to download from *www.planfarmsafety.ca* or *www.cfa-fca.ca*. More articles are archived at *http://communitycontent.ca/en/org/Canadian-Federation-Agriculture*.

Check out *Contacts for Media* to contact your provincial representative to find out more about what is going on in your area. If you would like to set up an interview or need any other assistance, please feel free to contact me at any time.

Canadian Agricultural Safety Week is delivered by the Canadian Federation of Agriculture (CFA) and the Canadian Agricultural Safety Association (CASA) in partnership with Farm Credit Canada (FCC) and Agriculture and Agri-Food Canada.

Thank you for your interest in farm safety.

Theresa Whalen
CFA Farm Safety Consultant
Tel: (613) 822-0016
E-mail: farmsafety@cfafca.ca

Great Tastes of Manitoba

Great Tastes of Manitoba is an educational cooking program that features Manitoba food at its best. This season, Manitoba Pulse Growers explored *Gluten-Free Baking with Pulse Flours*.

The original episode aired on Saturday October 22nd but the show will re-air on Saturday March 24th, 2012 from 6:30 PM –7:00 PM on CTV TV Cable 5.

BOARD MEETING – NOVEMBER, 2011

Canadian Soybean Council Update – An update on CSC's key initiatives was provided. A CSC incoming mission facilitated by Canadian International Grains Institute (Cigi) with delegates from Singapore, Taiwan and Thailand occurred in September. The 14 delegates toured through soybean facilities in Manitoba, Ontario and Quebec during the key harvest period. The group toured a soybean farm and met with farmers in all three provinces. The quality of Canadian soybeans was also highlighted during a tour of Cigi's research facilities in Winnipeg. R. Lewko along with three other members of CSC attended the Soy and Grain Trade Summit in St. Louis. A full report of the trade summit can be found in the CSC update on page 14.

Marketing Reports for MPGA Members – General discussion was had around providing weekly or monthly marketing reports for our members. We have not received a strong demand from our members about providing this service and we do provide a market update in each publication of *Pulse Beat*. It was determined that until we receive a stronger demand from our members, we will not proceed with this initiative.

AAFC Research Update – MPGA has had a few meetings with AAFC regarding their future commitments to research. Going forward, retiring researchers are only being replaced at a one to five ratio. Although there are some positions in Manitoba that the provincial AAFC officials see as a priority, these positions may not be a priority at the national level. Each MPGA crop committee has also discussed their research needs and MPGA will continue to work with AAFC to ensure that Manitoba has these needs met.

Minor Use Registration Update – J. Gaultier from MAFRI provided an update on the minor use registration program. MPGA will continue to stay on top of any problem weeds or diseases that are currently not covered and communicate our requests to MAFRI.

BOARD MEETING – DECEMBER, 2011

Finance Committee Report – The committee met and reviewed the submitted investment options from selected financial advisors. Currently we are receiving 1.95% interest on our savings account, which is better than a low risk investment option at this time. The MPGA board of directors will review investment options every six months to determine if the surplus should be invested.

Research Project Approvals – Each crop committee reviewed the research proposals submitted into the office in November. In total, the board approved funding for 17

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OUTGOING DIRECTOR

During the Annual General Meeting at the Special Crops Symposium on Wednesday, February 8th, MPGA board member Kyle Friesen presented Andrew Saramaga with a token of our appreciation for his leadership and dedication to the pulse industry. Andrew has completed two terms with MPGA, serving two years as MPGA's president. He will remain on the board as past-president but has elected to not run for another term. MPGA would again like to thank Andrew for his commitment, valuable input and knowledge he brought to the board during his terms. We look forward to working with Andrew through this transition period.

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new research projects totalling just over $280,000 for 2012, with an additional $295,000 for 2013 and $78,000 for 2014. For 2012, MPGA has committed over $450,000 to research projects. A full listing of MPGA funded research projects can be found on our website and our 2012 commitments will be published in the in the next issue of *Pulse Beat*.

By-law Amendments – The board of directors reviewed the current MPGA Constitution and Bylaws and determined amendments were necessary. Proposed changes include changing our industry directors to advisors and removing the vote for those who have a direct conflict of interest due to their funded research projects. The notice to members of an AGM or special meeting also required adjustment to coincide with MPGA's December issue of *Pulse Beat*. These amendments will be brought forward to the membership for adoption at the February AGM.

Special Crops Symposium/AGM - Details for SCS are in progress for this event in February – the topics have been chosen and the remaining speakers are being confirmed. Our AGM is scheduled for Wednesday morning. There are two three-year director terms and one two-year term up for election. Two directors, whose terms are up, will let their name stand for re-election.

Strategic Plan Review – MPGA staff and directors reviewed the strategic plan which was set into action in 2010. Focus areas include: Research, Market Development, Advocacy, Communication and Board Organization. Some highlights include: continued research support with more collaboration and matching contributions with government funding, continued support to Pulse Canada and the Canadian Soybean Council's initiatives, more local and domestic promotion of the health benefits of pulses through tradeshows and events, plus continued professional development for staff and board members.

MPGA Pulse and Soybean Industry Meeting – MPGA hosted a Pulse and Soybean Industry meeting on December 13th in Winnipeg. Items discussed were the 2011 variety trial insert, improvements to make in 2012, Seed MB, minor use, how to increase the percent of pulse acres in rotation, upcoming year's expectations on prices and acres, along with much more. We appreciate the time our industry members took to have this important discussion.

BOARD MEETING – JANUARY, 2012

Financial Statement and 2012 Budget – MPGA board reviewed the 2011 financials as presented. There was an increase in check-off revenue in 2011 due to the increased number of acres, very good prices in the market, and high amount of 2010 crop inventory sold in 2011. In preparation for the 2012 Annual General Meeting, the MPGA board reviewed the 2012 budget set forth by the finance committee. The board has decided to contribute an additional $200,000 from our reserve into the 2012 research budget, bringing our total 2012 contribution to research to $650,000. This budget will be brought forward and adopted at our 2012 AGM.

Meetings and Events – MPGA board and staff have attended various agriculture shows over the past few months including Ag Days (Brandon), Sask Pulse Days (Saskatoon) and Farm Tech (Edmonton). We have many important events coming up including: Special Crops Symposium (Winnipeg) and Production Day (Brandon), plus our annual meetings with the Minister of Agriculture and MASC. R. Froese, MPGA's Pulse Canada rep, has also been invited to attend the Global Pulse Conclave in India with Pulse Canada in mid-February.

MASC Deductible Working Group Update – A working group with KAP, corn, sunflower, pulse, potato and canola has been established to discuss the MASC 15% deductible for un-harvested crops. Currently, this is a fact finding initiative. Once the results of the analysis are presented, MPGA will review and determine our next steps, if any.

Pulse Canada Update – Pulse Canada has submitted an application for AIP funding for pulse nutritional research. Two of the projects relate to edible beans, therefore MPGA will be contributing extra funding to Pulse Canada from our edible bean research budget for these projects.

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Pulse Canada

IMPROVING RAIL FREIGHT SERVICE

The pulse industry's effort to improve rail-freight service took two steps forward this fall. On October 31, the Government of Canada appointed a facilitator to develop a template service agreement and a streamlined dispute resolution process, both of which were the pulse industry's key recommendations to the Rail Freight Service Review Panel. Pulse Canada is the only association to be appointed to the multi-sector industry panel tasked with developing a service level agreement template.

In November, Pulse Canada CEO Gordon Bacon was appointed by Agriculture and Agri-Food Minister Gerry Ritz as Co-Chair of the Crop Logistics Working Group. The Working Group will have three sub-committees. A service level agreement committee will create an agri-shipper service agreement template to contribute to the government's facilitation process. Pulse Canada Executive Director Greg Cherewyk will chair a sub-committee on performance measurement. The third committee will aim to answer questions regarding the future of producer car shipments in a post-CWB environment.

Securing predictable access to rail cars and encouraging improvements in rail freight service are central to the pulse industry's vision of enhancing competitiveness.

PROMOTING INNOVATION IN AGRICULTURE

In October, Pulse Canada delivered the pulse industry's message on the importance of market access and transportation efficiencies to the House Standing Committee on Agriculture, and on the importance of innovation in agriculture to the Senate Standing Committee on Agriculture and Forestry. The committees heard the industry's perspective on how important it is to focus on creating efficiencies across the entire supply chain and on how food can be central to Canada's health care strategy, and a major contributor to our environmental strategy. Appearances before the House and Senate standing committees are important ways for the industry to ensure government policies help to position Canada as a global leader in agri-food innovation.

PROMOTING SUSTAINABILITY OF PULSES TO THE FOOD INDUSTRY

Since January of 2011, Pulse Canada has been leading a collaboration of Canadian commodity groups along with Ducks Unlimited and General Mills to replicate commercially-focused, U.S.-based sustainability metrics for pea, lentil, wheat, oats, canola and flax in Western Canada. The U.S. group, Keystone Field to Market, is a coalition of U.S. farm groups, agribusiness, academia and NGOs, as well as food/ingredient companies like Cargill, Kellogg, Mars, General Mills and Coca-Cola.

The report, released in December 2011, represents a first step toward responding to customer requests for information on environmental performance of Canadian annual crops, and shows significant improvements over a 20-year period in land use, soil loss, energy use and climate impact. Those were largely driven by a combination of yield improvements, reduced tillage, improved crop rotations and improved nutrient management.

On December 3rd a team from General Mills travelled to Regina to meet with Pulse Canada staff and board members to better understand the results and chart potential next steps. This work will ultimately benefit Canadian pulse producers by ensuring food companies see the potential value of pulses and pulse foods in helping them meet their own environmental goals, helping generate demand for Canadian pulses.

WORKING WITH THE INTERNATIONAL PULSE TRADE COMMUNITY

At a board meeting in October, the international pulse trade association incorporated the promotion of pulses using health, nutrition and sustainability messaging into their strategic plan, following a recommendation from Pulse Canada. The board also agreed to allocate resources to the Nutrition and Science Committee, which is chaired by Pulse Canada, and to provide funding to advocate at Codex for the harmonization of MRL levels for pesticides of interest to the pulse industry. This work adds a major international voice to pulse promotion and leverages Canadian industry investments in these areas.

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Soy and Grain Trade Summit

From October 31st through to November 2nd, the Canadian Soybean Council (CSC) attended and exhibited at the **Soy and Grain Trade Summit** in St. Louis Missouri. The summit attracted over 50 exhibitors and 500 attendees from around the world. The Canadian Soybean Council was a part of the *Best of Canada* section along with 13 other Canadian companies including a number of exporter associations. The exhibit booth allowed CSC an opportunity to meet with a number of individuals and various organizations from the United States and around the world. The summit began with an industry tour day. Participants toured along the Mississippi River and learned about the many barges that move up and down the river before stopping in New Orleans, where the cargo is then shipped overseas. Participants also visited ADM's River Elevator, Affton Trucking and the Danforth Plant Science Centre – the world's largest independent research institute focused on plant sciences. The industry tours were followed by two days of seminars with presentations from members across the soybean value chain. CSC would like to thank Cigi for helping facilitate our attendance at the show.

Some interesting information gathered from the seminars includes:

- Sodrugestvo is the single largest non-GMO soybean crusher in Europe. Their daily crushing capacity is 3,300 tonnes. They are also the largest supplier of soybeans into Russia.
- The regions that contain the greatest opportunity for value-added soybeans are Western and Eastern Europe and Asia Pacific. The growth seen in Western and Eastern Europe is due to their growing interest in eating healthier foods.
- The biggest challenge facing Europe today is that most consumers do not know what foods contain soybeans.
- Denmark, Belgium, Netherlands and the UK are all moving towards more sustainable practices.
  - The Netherlands have indicated by 2015 all soybeans grown will be sustainably grown.
  - Belgium has stated that by 2015 their soybean production will be RTRS (Round Table on Responsible Soy Association)* certified.
  - Supermarkets in the UK have made a claim that by 2015 all supermarkets would like to be 100% certified under the RTRS.
- The total world production of soybeans in 2011/2012 will be 260 million metric tonnes. Production has been growing at a 3% rate each year for the past 10 years. This has been outpacing the world population growth which is increasing at a 2% rate.
- 85% percent of the total world soybean production is used in the crush market with only 7% used in tofu manufacturing. China is now using 25% of the total world production amount and 60% of all soybean exports.
- In 2011, the United States produced 96% of their soybean acreage as GMO varieties. This is the largest percentage they have seen to date. Higher premiums paid to the farmers are needed to increase non-GMO acres in the US.

The Canadian Soybean Council will be participating in the 2012 Summit in New Orleans in November.

**The Round Table on Responsible Soy Association (RTRS) is a global platform made up of the main stakeholders of the soy value chain with the common objective of promoting the production of responsible soy through cooperation and open dialogue with the parties involved for making it economically feasible, socially beneficial and environmentally appropriate.*

Policy Development and Young Farmers

When thoughts turn to spring and the planning for a new crop year gets underway farmers begin to look for new seed varieties, technology updates, analyze their business plans and other aspects relating to the farm and production that will be impacted in the coming year. Options are carefully reviewed and action plans developed.

Similarly, in preparation and planning for the coming year, farm organizations and commodity groups across the province are hosting their annual meetings, electing board members, and setting direction for the year.

Keystone Agricultural Producers Young Farmers Committee (KAP-YFC) encourages farm organizations to involve young farmers in this process, in particular the area relating to policy development.

In discussion with Rob Brunel, Co-Chair of the KAP-YFC, he was asked about his involvement with Keystone Agricultural Producers (KAP) and in particular the role of a young farmer in policy development.

"I've chosen farming as my career," said Brunel, "And, I want it to be a long-standing career. Therefore, I have a vested interest in policy development as the decisions that are made today will impact my operation not only in the short term but the long term as well."

He went on to say that coming out of university and returning to the farm he realized it was important to stay connected with other farmers and began attending the KAP district meetings in his area. He quickly realized that his thoughts and opinions as a young farmer were sought out by others and that his voice did have an impact on the policies being looked at and developed.

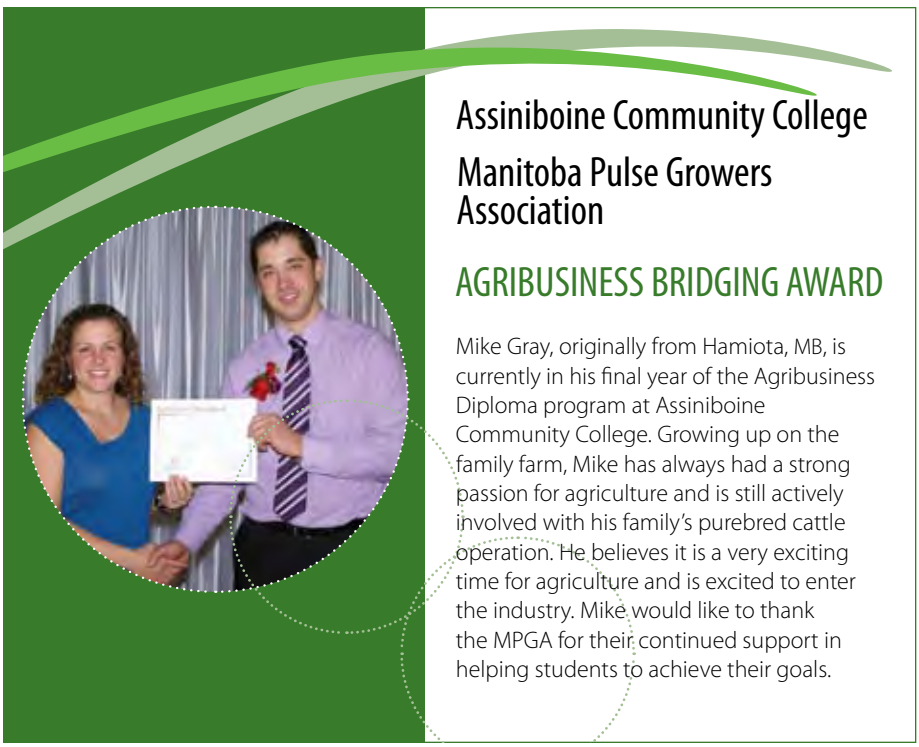
In dialogue with Don Dewar, Past-President of KAP, he was asked his thoughts on the involvement of young farmers in the development of policy. He went on to make the following comment.

"It is important that we 'old guys' engage and listen to the viewpoints put forward by the young farmers," said Dewar. "During my tenure with KAP, the opinions shared by the young farmers were invaluable in assisting to set policy for the organization; they are the future of the industry."

He added that he would encourage organizations to engage young farmers in dialogue as they are the ones that are 'pushing the envelope,' so to speak, and moving farming forward and that policy development needs to stay current if organizations want to stay relevant to those they serve.

"I realize that many young farmers, like myself at times, feel we are too busy or don't have a voice that will be listened to," said Brunel. "However, it is important to take the time to participate in a farm organization that you are interested in, even if it is at a local level. It allows you to stay connected and assist in setting direction for the future."

For further information on the KAP-YFC, and its activities, please visit *www.kap.mb.ca/kap_and_yfc.*



Assiniboine Community College

Manitoba Pulse Growers Association

AGRIBUSINESS BRIDGING AWARD

Mike Gray, originally from Hamiota, MB, is currently in his final year of the Agribusiness Diploma program at Assiniboine Community College. Growing up on the family farm, Mike has always had a strong passion for agriculture and is still actively involved with his family's purebred cattle operation. He believes it is a very exciting time for agriculture and is excited to enter the industry. Mike would like to thank the MPGA for their continued support in helping students to achieve their goals.

Tracey Drabyk-Zirk
Rural Leadership Specialist
Manitoba Agriculture, Food and Rural Initiatives, Beausejour

All-Terrain Vehicles (ATV) and Utility Terrain Vehicles (UTV) are being used on farms, ranches, and other agricultural workplaces to:
• apply chemicals • plough snow
• mow grass and cut brush • haul fuel, chemicals, salt, feed or other supplies
• herd livestock • check fences and irrigation lines • move small injured or ill animals.

Most workplaces in Manitoba fall under the jurisdiction of the Workplace Safety and Health Act and its regulation. Therefore, they must comply with vehicle registration and highway traffic legislation, as they apply to ATV use in Manitoba agricultural operations. It is important that agricultural workers, owners and employees receive training to understand how to operate and use them safely within their agriculture operation.

Manitoba Agriculture, Food and Rural Initiatives (MAFRI) initiated a train-the-trainer course which was recently provided to agriculture producers, industry workers, and educators. This opportunity allowed participants to learn about the regulations, safe operation and use of ATV's and UTV's. It was evident by the examples presented that what is common sense to you may not be to a family member or to an employee.

Course content and delivery was provided by the Canadian Agriculture Safety Association (CASA) with Farm Credit Canada (FCC) agreeing to support this ATV/UTV Safety Strategy.

After safely experimenting with varying amounts of weight in a unit; travelling through obstacle courses and on different terrain; and hearing about many incidents that have happened, these participants now have the skills and knowledge to instruct ATV/UTV courses. General ATV/UTV Safety workshops are being scheduled and will be held across the province in 2012. If you would like to participate or inquire please call Tracey Drabyk-Zirk, Rural Leadership Specialist with MAFRI at 266-1410 or email *tracey.drabyk-zirk@gov.mb.ca*.

It is important that everyone is aware of the hazards associated with operating all-terrain vehicles (ATV) and utility terrain vehicles (UTV). The key things to know about the proper use of an all-terrain vehicle are:
• make sure anyone using an ATV/UTV under your responsibility has been properly trained in basic ATV/UTV operation and safety. This includes family members and employees
• never allow passengers on an ATV/UTV – ATV's are designed for the driver to have ample room to manoeuvre as required by the terrain
• always wear an approved helmet
• never drive on or across a highway, unless you have a permit

Visit *http://safemanitoba.com/uploads/atvmanualbook.pdf* to download an educational manual called ATV Safety for Agricultural Workers.

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The directors of Manitoba Pulse Growers Association thank everyone in the pulse, soybean, and special crops industry for the tremendous show of support during the sixth annual Manitoba Special Crops Symposium. Without the support provided by the businesses below, this event would not be possible. MPGA also acknowledges the cooperation and contributions of Manitoba Corn Growers Association, the National Sunflower Association of Canada, and MAFRI in creating this event.

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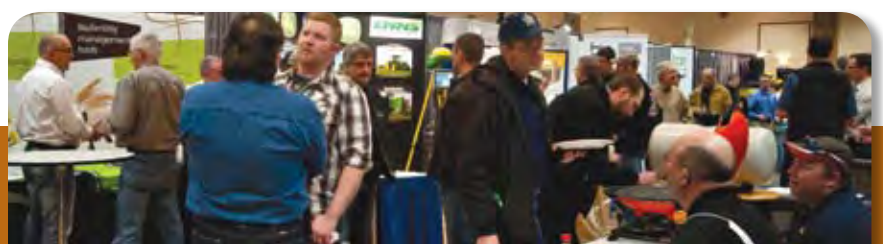

SOYBEAN RESISTANCE TO PYTHIUM SEED ROT AND SEEDLING BLIGHT

Allen Xue, Yuanhong Chen and Elroy Cober
Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa

Pythium seed rot and seedling blight (PSR&SB) are important diseases of soybean production worldwide. In previous studies, we identified that Pythium ultimum is the predominant species and responsible for the poor seedling establishment and root rot in central and eastern Ontario and southern Manitoba where the majority of short-season soybeans are grown in Canada (Figure 1). The disease severity increases with cool and moist conditions, minimum tillage and earlier planting. There is little information on variety resistance to PSR&SB in Canada. The objective of this research was to evaluate 94 short-season soybean cultivars released in Canada for their reactions to PSR&SB. Resistant cultivars identified from this study could be used for future cultivar development in Canada.

The 94 soybean cultivars were screened in both laboratory and greenhouse trials under artificial inoculations with a highly pathogenic strain of P. ultimum var. ultimum, isolated from a diseased soybean plant in Ontario in 2010. A total of 80 seeds in four replicate water agar plates per cultivar were used in laboratory trials and 80 seeds in four replicate plant trays per cultivar were used in greenhouse trials. The same amount of seeds that were not inoculated with the pathogen, but plated or planted in the same growth media, were used as controls for each cultivar in each trial. The experiments were repeated once for both the laboratory and greenhouse trials.

In the laboratory trials, none of the 94 cultivars were resistant to Pythium seed rot. Cultivars Maple Arrow Brown and Maple Ridge Brown showed moderate levels of resistance.

Figure 1. Healthy (left) and Pythium infected (right) soybean plants

The two cultivars showed no significant reduction on seed germination and less than 37% mortality after seven days on the inoculated water agar plates, in comparison to the non-inoculated controls. The remaining cultivars had

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Figure 2. Reaction of soybean cultivars to Pythium seed rot and seedling blight in the greenhouse: inoculated plants (front) vs. non-inoculated plants (back), and moderately resistant cultivar Maple Arrow Brown (left) vs. susceptible cultivar Maple Belle (right).

Table 1. List of 13 moderately resistant and moderately susceptible soybean cultivars to Pythium seed rot and seedling blight selected from 94 short-season varieties evaluated in Ottawa, Canada.

	Root Rot Severity	Reduction (%)		
Cultivar	(0–5)	Emergence	Plant Height	Dry Weight
Maple Arrow Brown	2.2	1.0	17.6	26.5
Maple Ridge Brown	3.9	2.5	53.1	37.0
AC Glengary	3.3	25.6	65.0	47.9
CeryxRR	3.8	34.2	73.7	49.3
Electron	3.9	25.6	67.4	35.8
Flambeau	3.1	31.4	57.1	30.1
Maple Glen	3.5	37.5	73.2	26.3
Maple Isle	3.5	17.9	71.8	34.9
OAC Gretna	3.8	38.5	68.5	12.3
OT06-13	3.1	29.7	58.1	60.8
OT06-22	3.8	33.3	66.1	51.0
PS44	2.4	30.8	63.6	38.4
PS46	3.5	35.9	65.1	27.3
Remaining 81 Cultivars				
Mean	4.0	63.2	75.0	46.2
Range	3.0–5.0	34.6–100	59.3–100	9.8–100.0

greater mortality rates, ranging from 60 to 100%.

In the greenhouse trials, 13 cultivars were moderately resistant or moderately susceptible to Pythium seedling blight (Table 1). Maple Arrow Brown and Maple Ridge Brown were the most tolerant cultivars with emergence reduction less than 3% compared to the non-inoculated controls, and were significantly better than other cultivars (18–100%) (Figure 2). In addition, Maple Arrow Brown was better than Maple Ridge Brown in resistance to root rot and reductions to plant height and dry weight. The remaining cultivars including AC Glengary, Ceryx RR, Electron, Flambeau, Maple Glen, Male Isle, OAC Gretna, OT06-13, OT06-22, PS44, and PS46 were considered moderately susceptible, having root rot severity of 2.4–3.9 on a 0–5 scale and emergence reduced by 18–39%, plant height by 57–72%, and plant dry weight by 12–60%. These cultivars have not been reported previously to possess resistance or tolerance to PRR&SR and may be used in resistance breeding for development of new Pythium resistant soybean cultivars in Canada.

Acknowledgements

This research was funded by the Grain Farmers of Ontario and the Manitoba Pulse Growers Association. We thank A. Nagasawa, H. Geng, J. Vogal, and Z. R. Djama for technical assistance.

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Research

- Hosted a Pulse and Soybean Industry meeting on December 13th in Winnipeg. Items discussed were the 2011 variety trial insert, improvements to make in 2012, Seed MB, minor use, how to increase the percent of pulse acres in rotation, upcoming year's expectations on prices and acres, along with much more.
- Met with AAFC and MAFRI representatives regarding a collaborative AIP funding application for fringe area soybean production research. Five sub-projects include the evaluation and adaptation of soybean varieties in Manitoba traditional and non-traditional growing areas, model analysis of soybean yield for soil properties and environmental conditions typical of Manitoba, agronomic management of soybean, soybean literature review and elemental composition of soybean. MPGA put the application together and should receive confirmation from AAFC in March.
- Attended a Cigi advisory committee meeting to discuss the Enhancing World Markets project. MPGA is a contributing funder in this project and was given a chance to provide input.
- Confirmed 2012 funding commitments with researchers.
- Provided feedback to Western Grains Research Foundation (WGRF) on new crop/new uses research: winter peas and end-use markets for faba beans.

Market Development

- Attended St-Boniface Hospital Foundation and the Reh-Fit Centre heart health benefits of super foods presentation. St-Boniface Hospital researcher Dr. Peter Zahradka shared his research results on adding pulses to your diet and its relation to cardiovascular health. MPGA had an opportunity to provide pulse nutritional information sheets and cookbooks.
- Continued involvement in foodManitoba meetings for the planning of 2012 events and promotion which include: *Great Tastes of Manitoba* cooking show, March nutritional month *Winnipeg Free Press* insert and attendance at the Royal Manitoba Winter Fair.
- Attended Grow Local conference February 23–25 in Winnipeg.
- Worked with Pulse Canada on the local promotion of Mission ImPULSEible 2012, a student food development competition. The provincial competition will be held in March or April. The winning first place teams from each province will be asked to present at a national competition at the annual Canadian Special Crops Association (CSCA) convention in Montreal, June 25–28.
- Participated in meetings with CSC to discuss the AMP funding application and the outgoing programs to Asia and Europe in February and March.

Advocacy

- MPGA Executive Director R. Lewko along with selected board members attended our annual meeting with the Minister on Feb 21st. Topics of discussion with Minister Kostyshyn included the vacant Pulse Specialist position with MAFRI in Carman, the proposed cosmetic pesticide ban, the importance of public research, and crop insurance items, including the 15% deductible on un-harvested crops and expanding soybean coverage to the Grandview/Gilbert Plains/Roblin area.
- Attended a MAFRI Commodity Group meeting with selected MAFRI staff and crop commodity associations in Manitoba to discuss opportunities and challenges, and increasing collaboration and communication between MAFRI and the commodity groups.
- MPGA Executive Director R. Lewko along with selected board members participated in a Pulse Canada strategic planning session on February 7th in Winnipeg. A follow-up session will be held on March 8th in Regina.
- Met MAFRI to review Environmental Programming under Growing Forward and provided feedback from a pulse and soybean perspective.
- Board members and staff attended KAP's Annual General Meeting and KAP's Commodity Group meeting at the end of January.
- Participated in a KAP working group meeting to investigate the cost/benefit of the 15% deductible MASC has applied to unharvested potato, vegetable, corn and soybean crops.
- Investigated expanding MASC soybean coverage to the Grandview/Gilbert Plains/Roblin area.

Communication

- Organized with NSAC, MCGA and MAFRI the sixth annual Special Crops Symposium held at the Victoria Inn Hotel and Convention Centre in Winnipeg on February 8th and 9th.
- Organized the second annual Special Crops Production Day with NSAC and MCGA held at the Keystone Centre in Brandon on March 1st.
- Board members and staff attended various shows and conferences over the past few months, including: Ag Days (Brandon), Sask Pulse Days (Saskatoon), Farm Tech (Edmonton), Global Pulse Conclave (India), North Dakota Bean Days (Fargo)
- Provided feedback to CFIA in response to their Question and Answer Soybean Cyst Nematode (SCN) Discussion Document, in which they are still proposing to deregulate SCN. MPGA is opposed to deregulating SCN.
- Gave a presentation on the Canadian Soybean Industry at Cigi's 38th Grain Industry Overview Course.
- Attended a meeting with MAFRI and CFIA to discuss deregulating SCN.
- Participated in Pulse Industry Roundtable (PIRT) meetings at the end of February to review the discussion paper drafted in November, which includes new mandates, goals and priority areas for the group to focus on.
- Provided a letter of support to Pulse Canada for a health claim on beans and cholesterol lowering.

For updated information check the website (www.manitobapulse.ca) or call the office at (204) 745-6488.

ADAPTATION OF EARLY-MATURING SOYBEAN IN SOUTHERN MANITOBA

Anfu Hou
Agriculture and Agri-Food Canada
Morden Research Station

Soybean production has increased steadily in Manitoba; however, there is no public soybean breeding program in the area. The soybean cultivars grown in southern Manitoba generally belong to the maturity group (MG) 00. Breeding efforts for such early-maturing cultivars are often limited by the lack of genetic materials. With funding from MPGA, a collection of 155 early-maturing soybean lines were evaluated at the Morden Research Station, Emerson and Thornhill during 2009–2011 growing seasons.

SOYBEAN COLLECTIONS AND FIELD DESIGN

One hundred and fifty-five soybean lines were introduced from the USDA Soybean Germplasm Collection at Urbana, Illinois. These lines originated mainly in China, Japan, and Russia, with maturity classified as MG 000 to MG 00. The seeds of these collections were increased in 2008 in the greenhouse at the Morden Research Station. The lines were grown in single rows of 5 m long and 60 cm in spacing, with one replication in 2009 and three replications in 2010. The evaluation was conducted with three replications in randomized complete block design in 2011 at three locations (Morden, Emerson and Thornhill). The traits that were investigated included seed germination, photo-period sensitivity, flower colour, flowering and maturing dates, growth habit, pubescence, iron deficiency resistance, lodging resistance, shattering resistance, seed hilum colour, seed size and yield potential. Check cultivars were also grown for comparison, which included OT03-10, OT03-13, AC Rolland, OAC Prudence, AC Orford, Glacier, Jim, Maple Presto, Maple Ridge and Trail.

RESULTS AND DISCUSSION

The majority of the lines had good emergence in three years and appeared well adapted to the local growing conditions. All of the lines flowered in the greenhouse and in the field, indicating no major photo-period-sensitivity concerns. The maturity dates varied, ranging from 92 to over 120 days, compared to 103 to 112 days of check cultivars. Shattering is generally a serious concern in adaptation for germplasm, but most of these lines did not shatter. Seed size varied significantly among the lines with 41 lines being large-seeded (tofu or vegetable bean type) and 22 small-seeded (natto type). Seed yield also varied significantly (Figure 1), ranging from 229 kg/ha to 1,884 kg/ha.

Seeding conditions were extremely wet in 2011 at Thornhill; however, the soybean lines germinated well. Some lines consistently outperformed the check cultivars. At the Emerson site, iron deficiency chlorosis was rated at the seedling stage in three replications. Some lines showed severe symptoms

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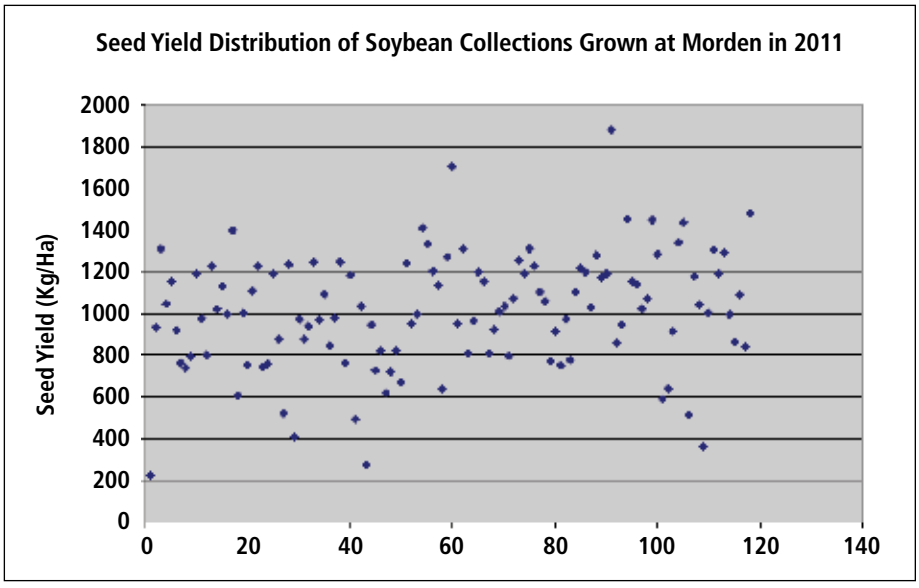

Figure 1. Seed Yield

that led to plant death or severe yield loss, while many other lines appeared highly resistant to the iron deficiency conditions. These lines will be further evaluated in the next few years.

The 155 early-maturing diverse soybean lines provide potential new breeding materials for the public breeding in Manitoba. The majority of the collection appeared suitable to the local growing conditions. The field evaluation has identified lines with desirable maturity, good seed characteristics, abiotic stress tolerance and high yield potential. Further evaluation at multiple sites will be conducted and elite lines will be used for crossing. As the seed amounts build up, the protein and oil content will also be estimated and selected.

Acknowledgements

The technical assistance for this research was provided by G. Dyck, L. Dyck and D. Young. The financial support provided by MPGA is greatly appreciated.

Robert L. Conner, Anfu Hou, Parthiba Balasubramanian and Debra L. McLaren
Agriculture and Agri-Food Canada

Manitoba Pulse Growers Association (MPGA) provided funding to continue studies to identify new sources of resistance to root rot and white mould of dry beans in 2011. The financial support provided by MPGA for these research projects was matched with funding from the Pulse Science Cluster of Agriculture and Agri-Food Canada. The white mould resistance study was conducted as a joint study, which allowed the collection of research data from multiple field sites in western Canada.

ROOT ROT RESISTANCE

Root pathogens have a detrimental effect on dry bean production by inciting seedling blights that reduce plant stands and root rot injury that decreases plant vigour and can lead to stunting, reduced yield or ultimately premature death of infected bean plants. Recent surveys of commercial fields of dry beans in Manitoba have identified four important root rot pathogens. For a fourth year, ten field experiments were conducted at the Morden Research Station to screen 52 dry bean cultivars to identify varieties that are resistant to one or more root rot pathogens. In each experiment, data was collected on seedling emergence, root rot severity and root nodulation. The 2011 results showed close agreement to those from the previous year's studies. A number of dry bean cultivars were resistant to at least one root rot pathogen and a few were resistant to several pathogens.

A field experiment was also carried out to examine the effects of different root pathogens or pathogen combinations on the yields of three dry bean cultivars that expressed different levels of resistance and a susceptible cultivar. As in previous years, certain root rot pathogens caused more severe symptoms than others, which resulted in yield losses in two cultivars that ranged as high as 20 and 28% in comparison to their uninoculated treatment. The yields of the other two cultivars were not significantly reduced by any of the root rot pathogens.

WHITE MOULD RESISTANCE

White mould caused by the fungus Sclerotinia sclerotiorum is an important foliar disease of dry beans throughout the world. Infection at flowering can result in the formation of a cottony growth of the fungus on the stem and pods and infected plant tissue later become bleached in appearance and often severely infected plants die. White mould is usually most severe under wet conditions, which provide a favourable environment for infection and the spread of the disease. Heavy plant canopies or dense stands of beans, which often have the highest yield potential, are usually most adversely affected by white mould. The development of more resistant dry bean cultivars is considered to

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IMPACT AND CONTROL OF FUSARIUM ROOT ROT IN FABA BEAN

Robert L. Conner, Kan-Fa Chang, Sheau-Fang Hwang, Debra L. McLaren and Bruce D. Gossen
Agriculture and Agri-Food Canada

For the past three years, a joint research study on Fusarium root rot of faba bean has been underway at field locations near Morden, Manitoba and Edmonton, Alberta. Financial support for this study from the Manitoba Pulse Growers Association (MPGA) was matched with a grant from the Agri-Food Research and Development Initiative (ARDI) to conduct research on other root diseases of this crop. The same study was also carried out at field sites near Brandon, Manitoba and Saskatoon, Saskatchewan with funding received from the Saskatchewan Pulse Growers (SPG).

Faba beans are currently grown on only a small acreage in western Canada. Although they are a good source of energy and protein in livestock feed rations, and an excellent forage crop that can produce high quantities of silage, one of the primary impediments to their greater utilization has been caused by tannins in the seed coat which adversely affect their consumption and digestibility in livestock feed rations. However, recent improvements in cultivar development, particularly the release of zero-tannin cultivars, are expected to lead to increases in the demand for faba beans and an expansion in their area of production.

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be an important component of an integrated pest management system to control white mould. However, the best cultivars that are currently available have only partial resistance that may not be sufficient to reduce crop losses under growing conditions that are highly conducive for white mould development.

Faba beans have developed a symbiotic relationship with a species of Rhizobia bacteria that leads to the formation of root nodules, which are the sites for the fixation of atmospheric nitrogen. The ability of faba beans to fix nitrogen eliminates the need to apply nitrogen fertilizers at seeding, which reduces input costs. Faba beans are generally regarded as a good rotation crop because they enrich the soil with nitrogen for subsequent crops.

A number of root rot pathogens can infect faba beans and they can be an important constraint on yield and the efficiency of nitrogen fixation. In 2009, a survey of root diseases was conducted in commercial fields of faba beans in Manitoba and Alberta. In both provinces, Fusarium root rot, caused by Fusarium avenaceum, was shown to be the most common root disease of faba bean. No crops appeared to be severely affected by root disease, but root diseases usually become more important after a crop has been grown in an area for a prolonged period of time. Root rot pathogens like F. avenaceum produce thick-walled spores in the crop debris that can persist in the soil for several years, so a five-year rotation with nonhost crops is recommended as one method of disease control. Some of these root rot pathogens can also infect field peas, so these pathogens could be well established in areas where field peas are frequently grown.

Fusarium root rot adversely affects crop production in several ways. Infection of seedlings prior to or shortly after emergence can result in damping-off and death of the seedlings resulting in uneven plant stands. The root systems of adult plants may become severely diseased, resulting in yellowing of the basal leaves, stunting of the plants and lower yields. Sometimes there are no above-ground symptoms, but a red discoloration can be seen on the root exterior and in the vascular system. The influence of Fusarium root rot on the growth of adult plants is usually most obvious in fields where soil conditions such as soil compaction, drought or excess moisture adversely affect root growth.

This study was established in 2009 to determine the impact of inoculum concentrations of the pathogen F. avenaceum on the effectiveness of different seed-treatment fungicides on root rot control in the tannin-free faba bean cultivar Snowbird. At each field site, data was collected on seedling emergence, root rot severity, root nodulation and yield. The results

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How Much Yield Are We Losing and What Can Be Done About It?

Hugh Earl, Associate Professor
Department of Plant Agriculture, University of Guelph

Theoretical considerations suggest that soil water deficits limit soybean yields in Ontario, Canada in most years, but there have been no published attempts to quantify these yield losses experimentally. In 2009, we began a three-year project to compare soybean yields under both rainfed and water-replete (irrigated) conditions. The objectives were to i) quantify yield losses associated with naturally occurring water stress in this region, and ii) quantify the underlying yield loss components, to identify plant traits that would enhance soybean yield under these types of soil water deficits.

The three years of the study contrasted one another with respect to rainfall amounts and distribution over the growing season. In 2009, precipitation amounts were very near the long-term (10-year) average, and rainfall was evenly distributed over the season. In 2010, total in-season rainfall was much higher than the 10-year average, but mild soil water deficits developed during seed fill in August. In 2011, total in-season rainfall was similar to the 10-year average, but unlike in 2009 it was very poorly distributed, with an extended dry period in July and then abundant rainfall through the remainder of the season.

Rainfed (i.e. unirrigated) yields in these trials were well above the provincial average in the first two years: 50 bu/acre in 2009 (vs. provincial average of 40) and 54 bu/acre in 2010 (vs. provincial average of 46). Despite a late planting date of June 12 in 2011, the rainfed plots still yielded 46 bu/acre (vs. provincial average of 45).

Even though there were no outward signs of water stress such as wilting in the rainfed plots at any time, supplemental irrigation significantly increased yields in each year of the study: by 9.8% in 2009, 8.4% in 2010, and 23.5% in 2011. Thus, with respect to the first objective for this project, it is clear that water deficits can result in substantial yield reductions in Ontario soybean, even in years when in-season rainfall is higher than normal.

To address the second objective, we made a suite of measurements throughout the season to characterize leaf canopy development, interceptance of solar radiation, crop biomass accumulation, and leaf senescence. We also attempted to partition the final yield differences among the various yield components. The most consistent finding across years was that water stress significantly hastened leaf senescence and crop maturity, thus shortening the seed fill period. Effects of water stress on leaf canopy development and crop biomass accumulation during the rest of the season were less consistent. In 2009 and 2010, canopy interceptance of solar radiation and crop biomass accumulation were very similar throughout most of the season, with small differences in crop biomass becoming apparent only during late seed fill, and then not persisting until harvest. In 2011, there were marked differences between the treatments for canopy interceptance and total crop biomass throughout the entire last half of the season. With respect to yield components, in all three years the number of pods per unit ground area was the component most strongly affected by water stress; number of seeds per pod and seed size were only mildly affected, if at all.

Overall, these results indicate that soil water deficits can significantly reduce yields of otherwise high-yielding soybean crops in this region, even in years when there are no obvious outward signs of water stress. This suggests that current efforts by plant breeders to increase drought tolerance of soybean varieties adapted to Ontario are well warranted. Specific traits that could be beneficial in this regard include: i) conservation of soil moisture through enhanced plant water use efficiency, ii) ability to set and retain relatively high numbers of pods even when mild water stresses occur, and iii) reduced susceptibility to accelerated senescence under mild soil water deficits. Currently, we are testing commercial soybean lines grown in Ontario for variation in these traits.

I would like to extend many thanks to the Agricultural Adaptation Council (Farm Innovation Program), Grain Farmers of Ontario and MPGA for financial support of the project.

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varied somewhat depending on year and location. However, the results from all four field sites indicated seedling emergence and yield generally declined with increases in F. avenaceum inoculum concentration, but its effect on root rot severity and nodulation were less consistent. Similarly, certain seed-treatment fungicides were effective in improving seedling emergence and yield, but their influence on root rot severity and nodulation was more variable. Seed-treatment studies in other crops have indicated that seed-treatment fungicides often provide only a zone of protection close to the seed that does not extend to the whole root system. The compiled results from this three-year study will be used to update recommendations on the control of Fusarium root rot in faba beans.

Acknowledgements
We thank W.C. Penner, D.B. Stoesz, T. Henderson, D. Hausermann, T. Kerley, G.D. Turnbull and K.A. Bassendowski for the technical assistance on this research study. We are very grateful for the financial support that was received from MPGA, ARDI and SPG for this study.

Development of Genetically Improved Yellow and Green Field Pea Varieties and Germplasm Lines for Canadian Pea Growers

DJ Bing[1], Don Beauchesne[1], Lorna Lundberg[1] and Al Sloan[2]
Agriculture and Agri-Food Canada
[1]Lacombe Research Centre, AB
[2]Morden Research Station, MB

2011 was noted as another year with excessive moisture and severe disease pressure for field pea breeding in a number of test locations. It was a very challenging year for the program because Al Sloan retired in the summer after 30-plus years of service and work in pulse breeding. However, it was also a very productive year in terms of variety development. The main components and progress in 2011 are summarized as follows.

The program ran in full capacity:

- In February 2011, two candidate varieties, MP1880 and MP1882, were supported for registration by the Prairie Recommending Committee Pulse and Special Crops (PRCPSC) committee. MP1880 was the highest yielding green pea in 2009–2010 pea co-op tests, while MP1882 was a variety with orange cotyledons.
- We had seven breeding lines tested in the second year pea co-op test. Six of the seven lines have been selected as the candidate varieties for registration and commercialization (see New Candidate Varieties on page 29 for more information). Twenty-one lines were evaluated in the first year co-op test, and eight of them have been selected as the second year co-op entries for the 2012 pea co-op test.
- Twenty-eight lines were grown in pre-coop trials in Lacombe and Morden, from which we have selected nineteen lines for 2012 co-op test.
- Approximately one hundred and thirty breeding lines were grown at eight test locations across the prairies to evaluate their geo-ecological adaptations. The tests in Morden were severely affected by excessive moisture, and tests in Barrhead had hail damage before harvest. We have selected twenty-one lines from the other six locations for 2012 pre-coop trials.
- Approximately six hundred breeding lines were evaluated in replicated preliminary yield trials (PYT). Unfortunately, the trials in Brandon and Indian Head suffered from excessive moisture, resulting in unreliable data for making selections. We selected seventy-seven lines in total from tests in other locations for 2012 multi-location tests, including fifty-nine yellow and green pea, fourteen marrowfat pea, four maple pea and one forage pea.
- A total of three thousand, three hundred and fifteen lines were grown in the micro-plot (1 m^{-2}) selection (MPS) blocks in Lacombe, and we have selected seven hundred and eighty lines from them for 2012 PYT.
- Fifty-two F6 or F7 generation progenies were grown in Lacombe in the single plant advance (SPA) blocks, and approx. 100–200 plants from each population have been selected for 2012 MPS.
- Forty-eight F5 populations were grown in Lacombe, and 100–200 single plants were selected from each population for 2012 SPA.
- Thirty-nine F4 populations were grown at two sites in Lacombe, and 100–200 single plants have been selected for 2012 F5.
- Thirty-nine F3 generation populations were grown in the winter nursery in Brawley, CA, as well as in the greenhouse at AAFC Lacombe Research Centre during the winter of 2010/2011. Approximately 100–2,000 single plants were harvested from each population and planted in the 2011 F4 nursery in Lacombe.

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- Thirty-five F2 populations were grown in the field in Lacombe, and 100–200 single plants have been harvested from each population. The harvested plants have been advanced to F3 generation in the greenhouse of AAFC Lacombe Research Centre using single seed descent. They will be harvested and grown in 2012 F4 nursery.
- Forty-two new crosses were made in 2011 and the F1s were grown in the field in Lacombe and Morden. Each population was harvested in bulk, and will be planted in the 2012 F2 nursery in the field in Lacombe.
- In addition to these components and progress of the main breeding stream, we also conducted disease resistance research for breeding on powdery mildew, mycosphaerella blight and downy mildew, and conducted the trials to collect plant breeders' rights. These studies will be reported at another time.

NEW CANDIDATE VARIETIES

Six breeding lines in the second year pea co-op tests were selected as the candidate varieties, which will be available for growers in 2012. These are all yellow pea lines and resistant to powdery mildew. They had higher yield and better lodging resistance than the check varieties. The main four characteristics, i.e. yield, days to maturity, thousand seed weight (TSW) and pre-harvest lodging (PHL) score (1–9, where 1 = no lodging, 9 = completely fall down on the ground) are presented graphically in Figure 1 and Figure 2 in comparison with the check varieties. Growers interested in any of these lines should contact the Office of Intellectual Property of AAFC or the authors of the report.

Acknowledgement

This Science Cluster Project on field pea breeding is jointly funded by AAFC, Alberta Pulse Growers Commission and Manitoba Pulse Growers Association (MPGA). MPGA also provided additional assistance in the financial management of the program.

Figure 1. Four main characteristics of MP1892, MP1894, MP1998 and the check varieties Cutlass and CDC Golden in 2010–2011 field pea co-op test-A.

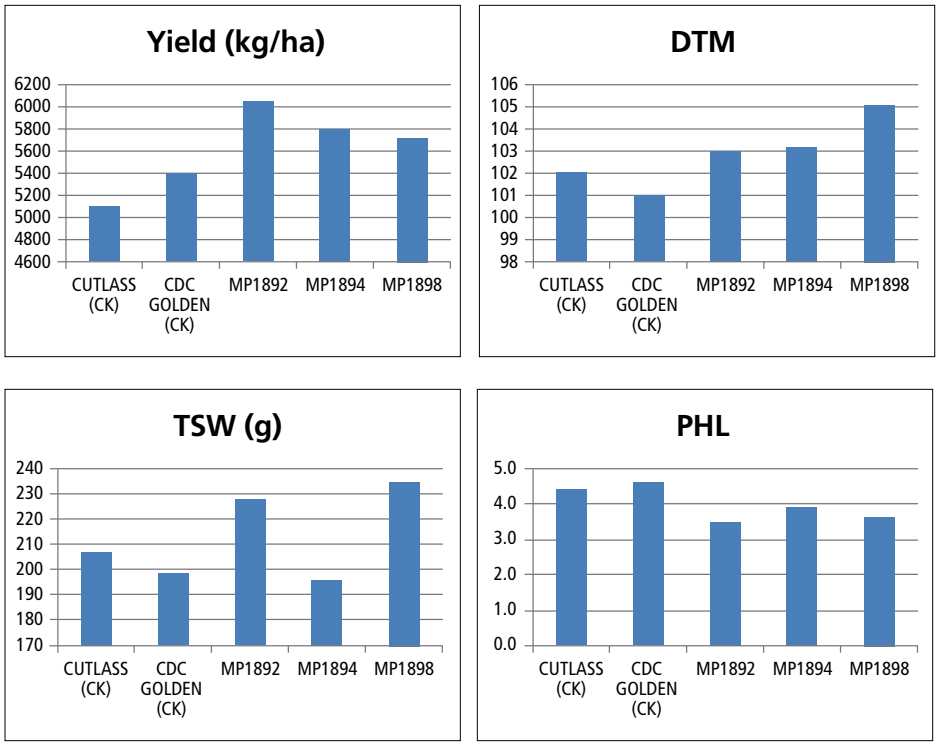
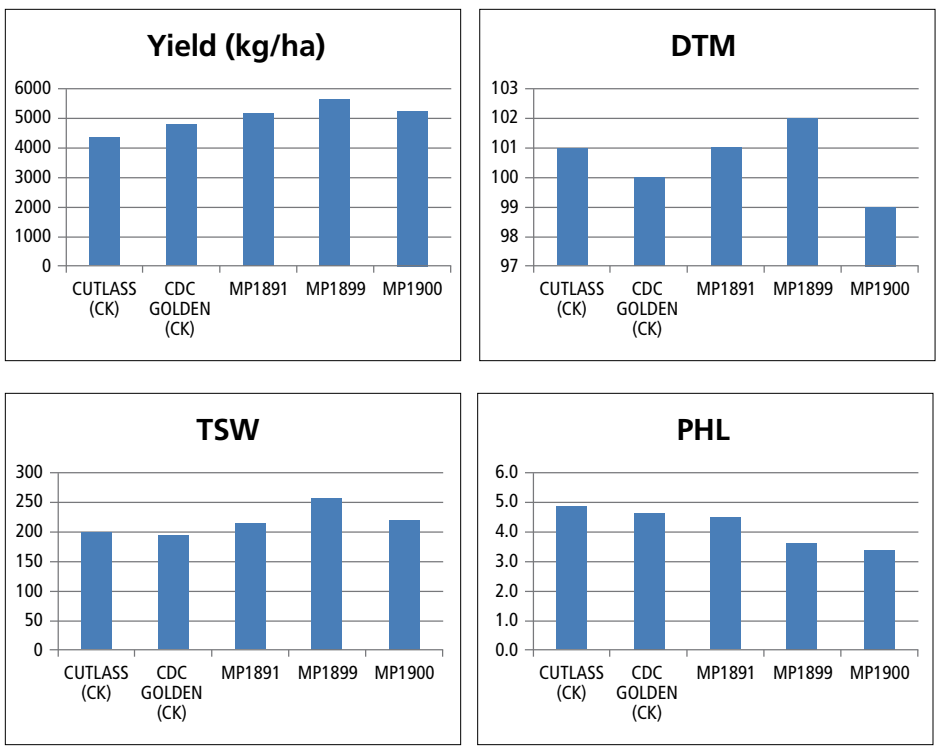


Figure 2. Four main characteristics of MP1891, MP1899, MP1900 and the check varieties Cutlass and CDC Golden in 2010–2011 field pea co-op test-B.



POTENTIAL OF MUNG BEAN PRODUCTION IN SOUTHERN MANITOBA

DJ Bing[1], Don Beauchesne[1], Lorna Lundberg[1] and Al Sloan[2]
Agriculture and Agri-Food Canada
[1]Lacombe Research Centre, AB
[2]Morden Research Station, MB

This project is to evaluate the possibility of mung bean production in southern Manitoba. Our studies in early years showed that certain mung bean germplasm lines had potential in the Morden area. In 2010 and 2011, we grew the six best genotypes selected from our early exploratory studies in Morden. The main findings in these studies are summarized in this article.

MATERIALS AND METHODS

Six mung bean genotypes (Table 1) were grown at AAFC Morden Research Station in 2010 and 2011. The experimental design was a randomized complete block with three replications and two seeding dates. The first seeding date in 2010 was May 17 and the second seeding date was May 26. In 2011, the same two seeding dates were used, but the plots seeded on May 17 had very poor plant emergence due to cool soil. So, we had another seeding on June 6. Thus, in 2011, May 17 was considered the first seeding date and June 6 the second seeding date. The seeding depth was 1.5 cm. Each plot was 1.2 m wide and 6 m long, consisting of four rows with 30 cm row space. The seeding rate was 45 viable seeds m^{-2}. No rhizobia inoculums were applied to the plots. The soil type was clay loam. The plots utilized natural rainfall during the entire season. Hand-weeding and the herbicide Poast Ultra were applied to control weeds. The number of days from seeding to the onset of flowering (DTF) was recorded as a reference of maturity. Crop desiccant Reglone was applied to assist with plant dry-down when top pods turned brown to black. Plots were harvested on September 28 in 2010 and September 16 in 2011. Plots were straight combined using a plot combine.

Figure 1. Mature mung beans grown in Morden in 2011.

Table 1. Yield, thousand seed weight (TSW), days to flowering (DTF) of six mung bean genotypes grown in Morden in 2010 and 2011.

Genotype	Yield (kg/ha)	TSW (g)	DTF (d)
CH0601	1393	39.0	63
CH0606	1559	42.0	67
CH0609	1152	42.0	66
CH0611	1708	54.0	62
CH0616	1828	69.0	61
CH0619	1924	63.0	62

RESULTS AND DISCUSSION

Plant Development and Adaptability

All six genotypes adapted to the local conditions for plant emergence and growth. They started to flower 61 to 67 days from the seeding date. All genotypes produced mature seeds (Figure 1).

Seed Yield

The yield of the six genotypes was very different (Figure 2). The highest yielding genotype was CH0619 with a yield of 1,924 kg ha^{-1}, and the lowest yielding one was CH0609 with a yield of 1,152 kg ha^{-1}.

Seed Weight

The genotypes were also very different in seed weight. The genotype with the largest seed size was CH0616 with a thousand seed weight (TSW) of 69 g, while the genotype with the smallest seed size was CH0601, having a TSW of 39 g.

Relationships Among Yield, Seed Size and Maturity

It was interesting to note the three highest yielding genotypes also had the

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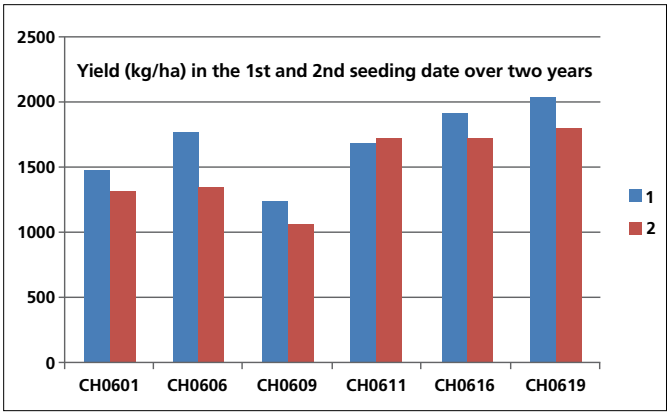


Figure 2. Yield of the six mung bean genotypes planted on seeding date 1 and seeding date 2 in 2010 and 2011.

largest seed size, suggesting the seed size was a significant component of seed yield. Another interesting observation was that the three highest yielding genotypes also reached flowering the earliest. Since early flowering is usually an indication of early maturity, early maturing genotypes were better adapted to southern Manitoba.

Impact of Seeding Date on Yield

Over the two years, the first seeding date had higher yields than the second seeding date, except for CH0611, which did not have a significant difference in yield between the two seeding dates. Thus, planting as early as possible in the spring should be recommended for getting higher yield. However, it should also be noted that time of planting is very critical. Planting too early may cause thin plant stands as we have demonstrated in 2011, where planting on May 17 had very poor emergence.

Other Observations

No severe diseases or abnormalities, prohibiting mung bean production in this area, were observed in any year. However, different leaf coloration (Figure 3) and rust-like symptoms (Figure 4) were observed. The nature and causes for these symptoms have yet to be identified.

CONCLUSION

Our studies have demonstrated that mung bean can be successfully grown in southern Manitoba. Furthermore, we have identified a few genotypes that may be grown as commercial varieties or used as breeding materials. More studies, including how to produce high-quality mung bean in southern Manitoba and development of mung bean markets, are needed for mung beans to become a crop in this region.

Acknowledgement

We greatly appreciate the Manitoba Pulse Growers Association for providing the financial support for this project.

Safe Farms – Spot the hazard, assess the risk, find a safer way, every day.

Figure 3. Abnormality of leaves observed in both 2010 and 2011.

Figure 4. Rust-like leaf discoloration observed in 2010.

PARTIAL RESISTANCE TO MYCOSPHAERELLA BLIGHT IN FIELD PEA

Robert L. Conner, Kan-Fa Chang and Sheau-Fang Hwang
Agriculture and Agri-Food Canada

Manitoba Pulse Growers Association (MPGA) continued to fund a study on partial resistance to Mycosphaerella blight in field peas at Morden in 2011. The financial support for this study was matched with a grant from the Pulse Science Cluster of Agriculture and Agri-Food Canada.

Mycosphaerella blight is the most important foliar disease of field peas in Canada. The disease occurs wherever field peas are grown and early severe disease outbreaks can reduce seed yields by as much as 50%. Mycosphaerella blight also can result in girdling and weakening of the stems of field peas making the crop more prone to lodging, which later interferes with harvest. Lodging of the crop favours disease development by reducing air movement within the crop canopy, which prolongs dew formation, thereby extending the time during which new infections can occur. Most field pea cultivars are susceptible to Mycosphaerella blight, but partial resistance has been reported in a few older cultivars. Depending on the cultivar, partial resistance reduces disease development on the leaves, stems or pods and sometimes in two or all three types of tissues. For a number of years, there has also been interest in identifying field pea cultivars with tolerance to Mycosphaerella blight. Tolerant cultivars can develop severe symptoms, but yield losses are much less than those of highly susceptible cultivars.

In 2009, a four-year field study was initiated to evaluate newly registered field pea cultivars for partial resistance to Mycosphaerella blight. A total of 27 new field pea cultivars and three check cultivars were evaluated in three field experiments. Each year, half of the plots in each experiment were sprayed with a protectant fungicide on two different dates during the growing season to delay disease development, while the remaining plots were inoculated by spreading infested pea straw throughout them to promote the uniform, early development of the disease. The yields of fungicide sprayed and inoculated plots of the cultivars were compared to identify cultivars that had the lowest yield reductions. In 2011, disease severity in all of the plots was rated at weekly intervals over a period of five weeks. Other agronomic factors such as seedling emergence, lodging, growth stage, powdery mildew severity and yield were also evaluated. Mycosphaerella blight severity was assessed at the end of the growing season on the leaves, stems and pods of plants in each plot.

In 2011, heavy precipitation early in the growing season resulted in flooding and premature death of plants in the low spots in some of the field pea plots. Dry conditions in July and August generally inhibited the build up of Mycosphaerella blight throughout the field pea plots and all of the disease ratings were less severe than those recorded in the two previous years. Symptom development on the pods was reduced by the dry weather, which made it more difficult to detect differences among field pea cultivars. However, some differences were still evident among cultivars for disease development during the growing season, final disease severity and the severity of symptoms on the leaves and stems. The fungicide spray applications suppressed the buildup of disease and their effect was still evident on the final disease assessment date. The fungicide applications resulted in yields that were as much as 31% higher than in the inoculated plots. Examination of the test results over the last three years has shown that disease development on at least ten cultivars was consistently reduced during the growing season and disease severity was significantly reduced at maturity. The same cultivars usually had lower leaf infection ratings, but their stem infection ratings were sometimes high. These experiments will be repeated in 2012.

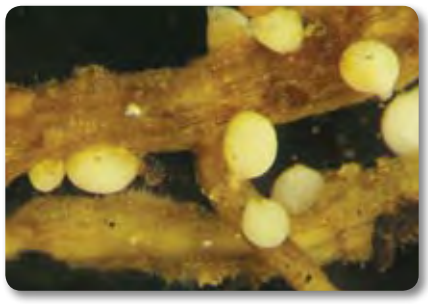
Acknowledgements
We thank W.C. Penner and D.B. Stoesz for the technical assistance on this research study. The financial support for this study that was received from MPGA and the Pulse Science Cluster is greatly appreciated.

MPGA has joined the social networking scene! Become our 'friend' on Facebook and keep up to date with MPGA happenings.

Visit www.manitobapulse.ca to find the link to Facebook.

Albert Tenuta
Plant Pathologist, OMAFRA

Soybean cyst nematode (SCN), Heterodera glycines, is the most important yield-reducing pathogen throughout Ontario and the U.S. In order to minimize the impact of SCN and educate Ontario soybean producers and the soybean industry/advisors about this very destructive soybean disease, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and Agriculture and Agri-Food Canada (AAFC) are participating in a North Central Soybean Research Program Project in partnership with the Grain Farmers of Ontario (GFO). The aim of the project is to improve SCN management in the northern soybean production areas. This proposal aims to investigate new objectives targeting further reductions in losses and improved SCN management through the evaluations of new nematicidal seed treatments and how these products affect SCN populations and soybean yields. Another direct result of this project will be the production of SCN educational materials in conjunction with collaborating north central U.S. states



▲ Soybean Cyst Nematode

The 2011 growing season was the first year of this new GFO/MPGA supported three year project. Replicated on-farm trials were established in two or more grower fields in Ontario (Highgate and Harrow) as well as cooperating U.S. States (Iowa, Nebraska, Michigan, Ohio, Indiana, Illinois, Minnesota, Missouri, North Dakota, Wisconsin, Kansas and South Dakota). Seed treatment nematicides used in this study included Votivo (Bayer CropScience), Avicta (Syngenta) and N-Hibit (Plant Health Care). Varieties used in this study included SCN resistant varieties commonly used for managing SCN and a popular susceptible variety. Data collected included stand counts, disease ratings, yield, seed quality, SCN levels, etc.

The seven treatments included were:
1. Avicta Complete® Beans
2. Apron Maxx
3. Poncho® (500)/VOTiVO® + Trilex 2000
4. Trilex 2000
5. N-Hibit® + Maxx®
6. CruiserMaxx®
7. Untreated

Twenty soil cores were collected at planting and at harvest from each plot in order to best represent the SCN population density (SCN egg density) at each location. A modified HG type (race) test was conducted on the

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Figure 1. Yield – Highgate, ON

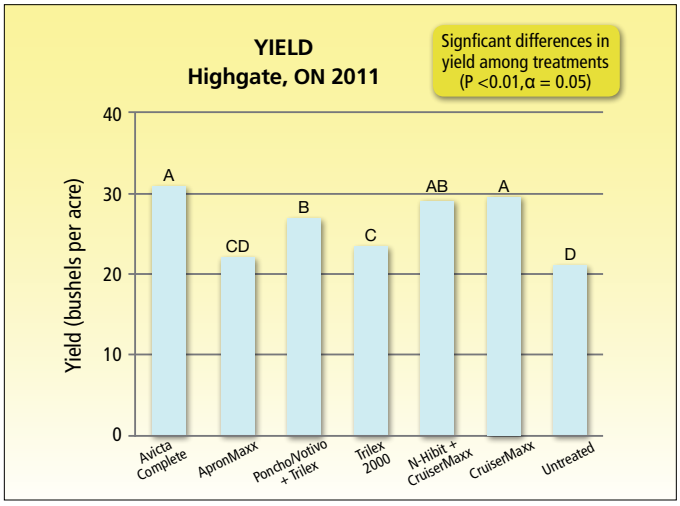
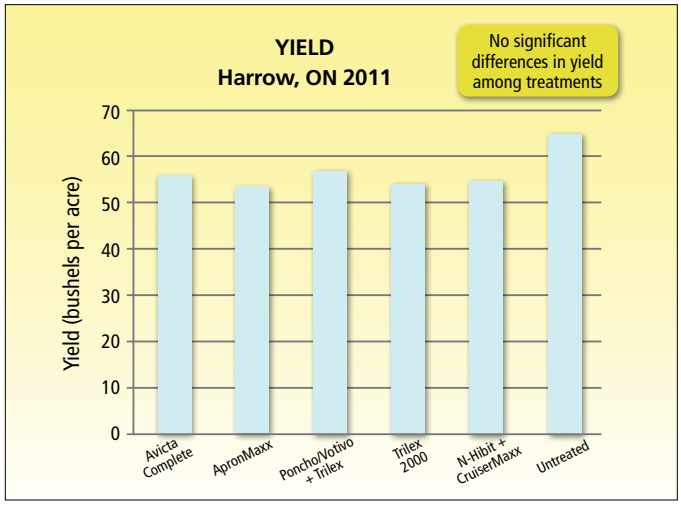


Figure 2. Yield – Harrow, ON



overall SCN population in each study location. The HG type test included only HG type differential soybean lines (SCN resistance sources) that are used in SCN-resistant soybean varieties available in the north central United States and Ontario (namely PI 88788, PI 548402, PI 437654, PI 209332). All HG typing was conducted through Dr. Terry Niblack's lab (Extension Nematologist at Ohio State University). In addition, all soybean varieties used for these projects were evaluated for SCN reproduction in the greenhouse.

Significant differences between treatments were observed in Highgate (Figure 1) but not the Harrow trial (Figure 2) location in 2011. In Highgate all treatments yielded significantly better than the untreated controls. However, the products containing a combination of active ingredients (nematicide, fungicide and insecticides) were significantly better then fungicide alone. Although the SCN population level data was not available at time of printing this report, other Ontario field evaluation trials have shown a decrease in SCN levels associated with seed treatment nematicides (Votivo).

This multi-year international project will continue in 2012 and 2013 through funding by GFO and MPGA as part of an international partnership with the North Central Soybean Research Program which is funded through the U.S. soybean check-off. The information generated from this project is being merged with the U.S. data to help generate a consistent management strategy for SCN and provide new technologies fore effective SCN management.

For further information on this project please contact:
Albert Tenuta, OMAFRA
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Acknowledgements
OMAFRA, AAFC, GFO and MPGA would like to thank Cheryl Van Herk, George Stasko, Chuck Meharg, Denis Fischer, Brian Stirling, George Kotulak and OMAFRA summer students for their help in the collection, processing of the samples and dedicated service to this project. In addition, we would like to thank our grower cooperators in the Highgate and Leamington areas as well as our U.S. colleagues which are listed below.

U.S. Investigators/Institutions Involved in this Project
Greg Tylka co-project leader (University of Iowa), Loren Giesler co-project leader (University of Nebraska), Carl Bradley (University of Illinois), Anne Dorrance (The Ohio State University), Terry Niblack (The Ohio State University), Doug Jardine (Kansas State University), Dean Malvick (University of Minnesota), Laura Sweets (University of Missouri), Sam Markell (North Dakota State University), Lawrence Osborne (South Dakota State University), Paul Esker (University of Wisconsin), George Bird (Michigan State University and Jamal Faghihi (Purdue University).

MPGA VISION
Vibrant profitable farms sustainably producing a variety of quality pulse crops to feed a healthy growing world.

Manju Misra and Amar Mohanty
School of Engineering and Dept. Plant Agriculture, University of Guelph

This project is targeted to develop novel biopolyurethane materials from agricultural resources for industrial applications related to the main theme of "Bioeconomy-industrial Uses." This will utilize soybeans in the form of oil, polyols and hulls. These biobased materials will satisfy the federal laws and regulations on green technologies, help the environment with lower CO2 and volatile organic compound (VOC) emissions, and reduce the use of petroleum-based chemicals for automotive parts.

Among new plant-based polymers, polyurethane (PU) is one of the most useful three-dimensional polymers. PU, derived from plant components, can be used for a variety of products, including sheets, plastics, foams, adhesives and paints. Physical properties of polyurethane can easily be controlled by molecular design. Soybean phosphate ester polyol (SOPEP), which is made by acid hydrolysis of soybean oil in the presence of phosphoric acid, can substantially reduce VOCs. In addition, it can also reduce the cost of PU-based products, being derived from a relatively inexpensive and renewable resource. In the preparation of polyurethane foam products, the use of distilled water is an additional eco-friendly alternative. Distilled water is the most widely used chemical-blowing agent, due to its zero ozone depletion potential (carbon dioxide is produced as a by-product instead of chlorofluorocarbon (CFC)). For the reinforcement of polyurethane materials, many materials such as microcrystalline cellulose (MCC) and carbon nanotube can be used.

Figure 1. Photographs of the biofoam composites: (1) 0:100, (2) 20:80, (3) 40:60, (4) 50:50, (5) 60:40, (6) 80:20 and (7) 100:0. (SOPEP : Jeffol A-630)

The novel polyurethane biosheets, biofoams and bioplastics were prepared from soy based polyol. Microcrystalline cellulose and carbon nanotube were used to reinforce the products properties (i.e. mechanical and thermal properties). Water was used as a chemical blowing agent to reduce VOCs and cost of the formulation.

The research results are summarized under four categories:

1 RIGID BIOFOAMS FROM TWO POLYOLS (SOY OIL BASED POLYOL AND PETROLEUM BASED POLYOL)

Rigid biofoams were prepared by varying the mixing ratios of two polyols (soy polyol SOPEP and petrochemical polyol Jeffol A-630). The composites were characterized by fourier transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM). Mechanical properties, thermal properties and density of the composites were also measured.

The biofoams were prepared via free-rise method. Polyols (Jeffol A-630 and SOPEP) were mixed in a polyethylene beaker by mechanical stirring, followed by the addition of polymeric methyldiphenyl diisocyanate (pMDI) to the mixture. The mixture was stirred until it was white, which is the indication of foam formation. Photographs of the biofoam composites are shown in Figure 1. SEM images of the samples at cross-sections perpendicular to the direction of rising of the biofoam are presented in Figure 2. All of the samples have very uniform and closed cell structure.

2 RIGID BIOFOAMS FROM SOY OIL BASED BIOPOLYURETHANE AND MICROCRYSTALLINE CELLULOSE

Soy-based rigid biofoam (BioPU) was used as the polymer matrix, which was used to replace up to 50% of the petroleum-based polyol. The biofoam filled up to 10 wt% of MCC and were prepared by free-rise method. SEM and density of composites were measured, the chemical structure was characterized by FTIR, and the mechanical and thermal properties were also studied. Figure 3 shows the photographs of the biofoam. The samples have smooth surfaces and the colour of new biofoam composites

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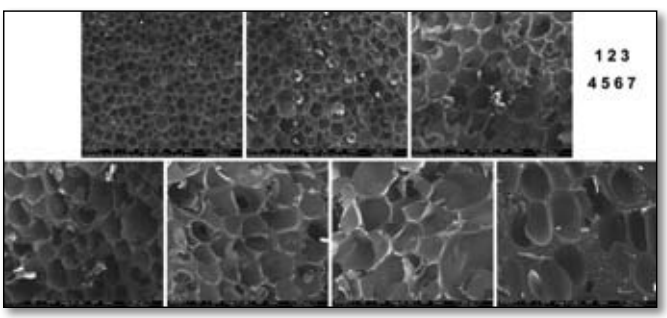

Figure 2. SEM images of the cross-section display of the biofoam composites: (1) 0:100, (2) 20:80, (3) 40:60, (4) 50:50, (5) 60:40, (6) 80:20 and (7) 100:0. (SOPEP : Jeffol A-630)

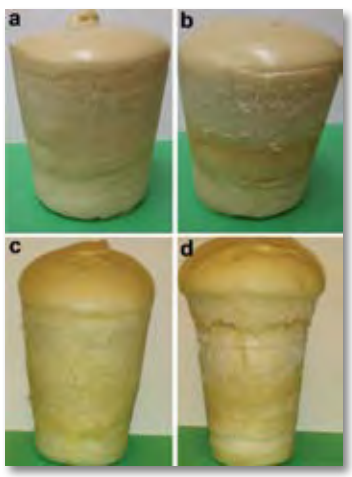

Figure 3. Photographs of neat biofoam and biofoam composites: (a) 0%, (b) 1%, (c) 5% and (d) 10 wt% of MCC

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becomes lighter with the increase of MCC content. Figure 4 shows that the closed cells are homogeneously dispersed in the biofoam and the average of all samples are approximately 150 µm. MCC did not alter the closed cell structure of the biofoams, which shows that they can act as nucleation sites to promote the formation of fine cell structure.

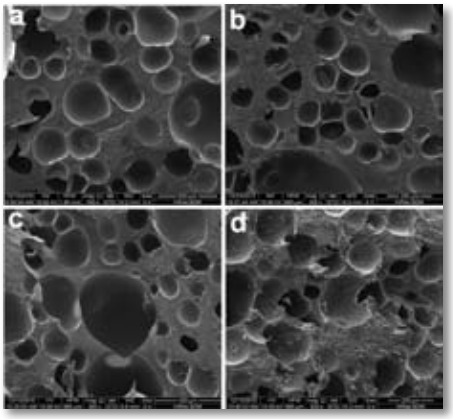

Figure 4. SEM images of neat biofoam and biofoam composites: (a) 0%, (b) 1%, (c) 5% and (d) 10% of MCC

3 WATER-BLOWN RIGID BIOFOAM COMPOSITES FROM FUNCTIONALIZED SOY OIL BASED BIOPOLYURETHANE AND MCC FOR AUTOMOTIVE APPLICATIONS

In this work, water was used as the chemical blowing agent and BioPU was chosen as the polymer matrix. The biofoam containing up to 10 wt% of MCC was prepared by free-rise method. Foam morphology, density, FTIR, mechanical and thermal properties were studied through various methods. SEM images of the neat biofoam and biofoam composites at cross-sections perpendicular to the direction of rising of the biofoam are presented in Figure 6. As can be observed from the micrograph of the neat biofoam (Figure 6a), the cell size and cell distributions are nearly uniform and a negligible amount of cells with broken walls was observed. Micrographs of the MCC reinforced biofoam are shown in Figure 6b–d. With the addition of MCC, the overall cell structure became more uniform and average thickness

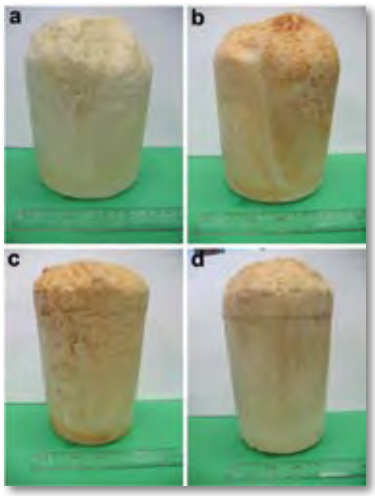

Figure 5. Photographs of neat biofoam and biofoam composites: (a) 0%, (b) 1%, (c) 5% and (d) 10% of MCC

of the cell walls decreased, but a larger number of broken cells were observed. Alteration in the cell morphology is due to the presence of MCC which affects the process of cell nucleation. The average cell size of the neat biofoam was found to be 643.6 µm while the composites with 1, 5 and 10 wt% of MCC have cell sizes of 581.1, 568.7 and 392.1 µm, respectively. The composites with 10wt% of MCC had more uniform cell structure.

4 BIOPOLYURETHANE BIOPLASTIC REINFORCED WITH MULTI-WALLED CARBON NANOTUBES (MWCNTS)

MWCNTs and biopolyurethane nanocomposites were prepared by compression moulding. In this method, two polyols (Jeffol A-630 and SOPEP) were mixed on 20:80 ratios with a certain amount of catalysts (DABCO T12) and MWCNTs added into the two polyols. Then they were mixed well using homogenizer and ultrasonication. Polymeric MDI was then added by stirring and then the mixture was poured into a mould. Samples (Figure 7) were prepared by compression moulding in a Carver laboratory press. The processing conditions varied in the MWCNTs' percentage, temperature, processing time and pressure, as this nanocomposite processing engineering is yet to be optimized. Morphological,

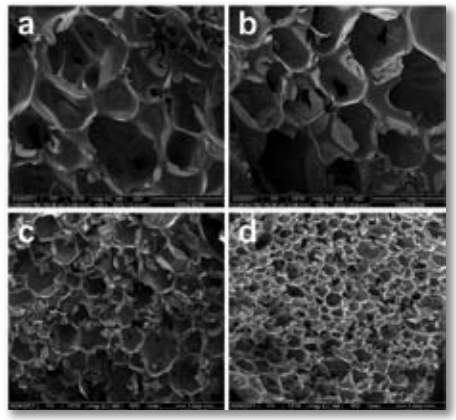

Figure 6. SEM images of neat biofoam and biofoam composites (scale bar: 1 mm): (a) 0%, (b) 1%, (c) 5% and (d) 10% of MCC

chemical, mechanical, thermal and electrical properties were studied to optimize the processing.

More research is currently underway to find applications of the prepared green composites for housing panel sectors. The exploration of bio-based polyurethane and natural fibre based "all green composites" has been proposed as our next target of study.

Figure 7. Photographs of neat BioPU and BioPU (99.9%) + MWCNTs (0.1%)

BENEFITS TO FARMERS

This research project will add value to soybean oil by creating bio-based renewable polyol green composites with significant commercial value, and there is the potential for additional economic benefits to soybean producers. The value-added uses of such composite applications will help soybean farmers find additional revenue potential.

Acknowledgements

Financial support from the Manitoba Pulse Growers Association (MPGA), the Grain Farmers of Ontario (GFO) & University of Guelph / OMAFRA Bioeconomy – Industrial uses Research Program are greatly appreciated.

The Return of Edible Beans and Farmer John

Dennis Lange
Farm Production Advisor – Crops
Manitoba Agriculture, Food and Rural Initiatives

When we last spoke with Farmer John in the spring 2007 edition of *Pulse Beat*, we were looking at weed and disease control in edible beans. Due to competing crops having better returns, John had stepped away from growing edible beans for the past three years. But in the spring of 2011, he decided it was time to give them a try again! Although with the wet spring, John changed his mind at the last minute but continued to follow the bean market through the summer. In the fall of 2011, he again made the decision to grow beans in 2012. John was able to pick up a contract for 38 cents/lb, but because he had been out of beans for a few years it took him a bit of time to decide on what type to grow. Let's have a look at the thought process behind John's decision.

One of the first things Farmer John had to decide on was where to plant the beans. He looked through his field list and came up with a few possibilities. Field A, which is a new piece of ground, had soybeans on it two years ago but spring wheat last year. He spoke with his bean buyer and was informed that soybeans are a food allergen and there is a good chance the soybeans could volunteer. If that happened, his buyer told him that the black beans could be rejected at delivery. John decided that it might not be the best field for his blacks.

Field B is a piece of ground he just bought last year. When he checked into the rotation, he found that there hadn't been any edible beans planted in the last four years. The field is well drained, free of stones and a good candidate for growing beans. The only problem is the location. Although 2011 was a very dry summer and relatively disease-free, there were a few cases of anthracnose reported and confirmed in the area that Farmer John wanted to plant his beans. From John's past experience growing beans, he learned that anthracnose residue could persist in the stubble for at least two years. Since the variety he chose is susceptible to race 73 of anthracnose, which is the predominant race found in Manitoba, he decided that he should continue looking for a different field. On a side note, anthracnose transmission can take place through infected seed and through infection from previous year's stubble.

Farmer John finally found the perfect field. It has not seen beans in four years, has good drainage, last year there was a cereal planted and there is no risk of contamination from any soybeans. When John looked at his crop insurance records, he found that this field had produced some of his best dry bean yields. We have a winner!

John had investigated other bean types before coming up with the selection to grow blacks. He has grown light red kidneys, pintos and navy beans in the past and had good success with all types. This year he wanted to keep things simple since he is only growing 160 acres of beans and does not want to use his planter. Another reason he chose black beans is that after looking at the 2011 MPGA edible bean trials results he found a variety with good pod height, which allows John to flex-head his beans, and is also early enough to reduce the fall frost risk. Next year, John plans to expand his bean acres and will look at growing some of the other types in order to spread his risk around. This may also allow him to capture some of the premium prices the other bean types might offer.

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The following is some additional information that one should consider when growing edible beans. Look at this as a bit of a refresher for growers that have stepped away from beans in the last couple of years.

The chart below will also help John with planting rates and plant population.

Suggested Plant Populations for Dry Beans

Bean Type	7-inch Row	22-inch Row	30-inch Row
Navy or Black	160,000–170,000	110,000–130,000	100,000
Pinto	80,000–90,000	75,000	65,000–70,000
Kidney Beans	n/a	70,000–85,000	70,000–85,000

When calibrating planters the following chart can be used as a guide. These charts will help determine if you are getting the desired spacing you are looking for.

		Row Width Seed Spacing Within Crop			
Approx lbs Live seed/acre	Plants/acre	6-inch	12-inch	22-inch	30-inch
Navy/Black					
30	75,000	–	–	3.8	2.8
40	100,000	–	5.2	2.9	2.1
50	125,000	8.4	4.2	2.3	1.7
60	150,000	7.0	3.5	1.9	1.4
70	175,000	6.1	3.0	1.7	–
80	200,000	5.2	2.6	1.5	–
Pinto Beans					
50	62,500	–	8.4	4.6	3.4
60	75,000	–	7.0	3.8	2.8
70	87,500	–	6.3	3.3	2.5
80	100,000	–	5.2	2.9	2.1

Source NDSU Extension Service

THE FOLLOWING IS A CHECKLIST OF THINGS TO CONSIDER WHEN GROWING EDIBLE BEANS

1. Use a good seed source. Diseases such as anthracnose can be transmitted by seed so using bin run seed can increase your risk. If you don't have a good seed source nothing you do during the growing season will make up for it.
2. Ask your seed supplier about germination and seed size. This will help in plant stand calculation.
3. Ask about market acceptability of a variety. With speciality beans, buyers may prefer specific varieties. Asking the question now makes marketing the beans easier later.
4. If you are solid seeding beans, ask about seed moisture when purchasing seed. Dry seed is more susceptible to damage when using air-seeders. If you can get seed above 16% moisture it will reduce mechanical damage. Also, slow down the fan speed (airflow) to reduce the amount of seed injury to acceptable limits. Airflow should be cut back as much as possible, while still maintaining uniform seed distribution across the width of the seeder.
5. Know your weeds and control your weeds early. Use a combination of a pre-plant herbicide and a post-emergent herbicide to give you a wider window of protection. When they are small, edible beans are not great competitors with weeds, thus the importance for controlling weeds early.
6. Budget for white mould control and evaluate the need during the growing season. If weather conditions, variety susceptibility and plant growth are all in favour of disease development then spray according to the label.
7. Scout for diseases such as anthracnose and use a fungicide when appropriate.
8. If a pre-harvest weed control product such as glyphosate is needed, discuss the options with your contracting company to see if there are any restrictions on the use of the product.
9. At harvest remember slow cylinder speed and concave tight. You will get better quality beans in the grain tank. If you are harvesting speciality beans such as light red kidneys the addition of a belt unloading system or a specialty bean combine may be something to consider to achieve the best quality.

In conclusion, there are many things to consider when growing beans and choosing what type to grow. Producers should look at all factors when making a decision. Factors such as maturity, pod height and market acceptability are just a few of the considerations. Producers should look at their own situation and decide what bean type would best suit their production capability and limitations.

Rick Vaags always knew he was going to continue farming. After attending college, Rick began farming with his father in 1978. Near Dugald, Manitoba the Vaags' own and operate a 4,000 acre grain farm consisting of canola, cereals and soybeans along with a 1,200 farrow to 50 sow barn. Rick and his wife Anny have four boys: Matt, Josh, Joel and Mike. His sons help out on the farm, which can operate with up to seven employees.

Rick first grew soybeans in 1998, but did not add them consistently to his crop rotation until 2003, once newer varieties were developed. According to Vaags, soybeans are a good option to add into your rotation. "They spread out the workoad and are good for the land." In Rick's operation, adding soybeans has lengthened both the seeding and harvesting window. "You can focus on your cereals, then canola, then your soybeans," adds Vaags.

With the majority of the last few years being so wet in Manitoba, Rick has seen the benefits of soybeans on his farm. "They have handled the moisture well. The last five out of seven years here have been so wet, and our soybeans have come out great," adds Vaags. Rick also knows that with their ability to fix nitrogen, soybeans provide added nutrients and blacken the soil. Vaags usually seeds 30% of his total acres to soybeans.

Rick has grown conventional soybeans in the past, but now strictly uses the Roundup Ready system. "There is a lot of versatility in the Roundup Ready system. It helps control weeds and assists in preventing weed resistance because we are changing our herbicide use," says Vaags.

Rick has recently completed one year of a two-year term on the Manitoba Pulse Growers Association (MPGA) board of directors. Rick joined the board because he thought this would be an opportunity to interact with other producers and find a better way to do things. "I have already gathered a lot of information from other producers on how they grow their own crops and how they perceive the industry," says Vaags.

Rick Vaags and Family

"I am amazed at how busy the MPGA office and board is, how much time and money we put into research, and the other advocacy initiatives the pulse growers are involved in." Rick is looking at his position on the MPGA board as a way to broaden his horizons and provide direction to where producer levy dollars go.

One discussion Rick was excited to be a part of was a recent meeting with the Keystone Agricultural Producers (KAP). This meeting was to find good news stories about agriculture in relation to getting Lake Friendly Certified. "They were looking for good news stories to share about agriculture," says Vaags. "I piped up – pulses, they are a good news story. Each year there are more acres being seeded into soybeans and because soybeans do not need fertilizer they are good for the environment," adds Vaags. In Rick's mind, more soybeans equals less fertilizer.

Vaags has seen a large increase of soybean acres in Manitoba. "Fifteen years ago, only a fraction of the acres in Manitoba were soybeans, now, the acres are exploding," indicates Vaags. "As the genetics change and improve, the number of acres of soybeans will increase as the areas where they can be grown expand." Rick also believes that given the current economics producers are facing, more and more producers will choose to add soybeans into their rotation. "As fertilizer prices increase, more producers will choose soybeans for their farms," believes Vaags.

"Soybeans need less fertilizer, so after the cost of seed, there it very little extra cost to grow this crop." Rick also adds that with continued varietal research, the beans will get bushier, taller and easier to harvest. "Right now the pods are close to the ground, but that will improve."

With less research dollars being allocated by the government, producers are going to need to depend on their associations to fund research. "That is why levy dollars are important to an association," says Vaags. "We can fund projects that will put the research back into the producer's hands. Research that will expand the areas to grow soybeans, increase yield, and better harvestability practices – the whole agronomic package," adds Vaags.

Rick sees a future in the pulse industry in Manitoba. With the continued growth of soybeans in fringe areas and MPGA's commitment to research, soybeans are will make an impact for producers in Manitoba.

George A. Jibilian
Multigrain International, LLC

The information age as we know it is dead. There's too much information presented in far too many formats for the average user to make sense of it. Wading through endless government reports and university studies won't provide the farmer or the wholesaler with the tools they need to make informed decisions.

What is needed is a combination of tools in order to make precise recommendations on actionable information, particularly as it applies to a global environment. The prices from local markets will not provide the big picture of global demand, where the markets are headed and why. More than ever before, the prosperity of agriculture and the agri-food sector depends on the ability to compete in world markets, and this is improving daily. Technology and communications become increasingly vital as weather conditions globally put added demands on farmers.

The drought Australia suffered through during the latter half of the past decade caused a need for the importation of wheat and other crops. Normally self-sufficient, Australia found itself at the mercy of the weather and had to import wheat to honour massive export contracts. Australia had pledged to major customers in Japan, Korea and Indonesia that it would meet forward orders. Even so, Australian exports would fall. The wheat industry correctly anticipated the Australian wheat stockpile of about three million tons from 2005's crop would be exhausted by export demand. New markets such as India have become heavy buyers of wheat and have "sopped up quite a bit" of the world wheat surplus, said Mr. Warren Truss, who was at the time Australia's Minister for trade. "Nobody gives a damn where they get this or that wheat from as long as the seller fulfills the contract with the buyer – that's the main thing," said Bryce Bell, a former grains industry executive and historian.

Careers in the agricultural industry have become as diverse and varied as the world we live in. The obvious image of the farmer in a field needs to be updated to include, biotechnology, transportation, wholesale and retail sales, food processing, as well as research and development. Technology and research are critical as climate change is inevitable. Understanding how the world is changing will help make informed decisions as to how best to use resources. Working to create an interest in the agricultural industry is a no-brainer, as it is an always in-demand commodity.

Research and development become critical to innovation. Innovation improves the manner in which capital and labour inputs are combined, resulting in more efficient and effective production. This contributes to increased productivity growth and enhanced competitiveness. Innovation can also lead to the development of new products and business alliances, which also enhances competitiveness. R&D, capital

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Brian Clancey
Senior Market Analyst and Publisher

Dry edible bean production across North America has been devastated by poor weather in Canada, the United States and Mexico. While Mexico has struggled with drought, its northern neighbours were unable to finish seeding last year's crops because of an unusually wet spring.

Production in Canada and the United States is down almost 652,000 metric tons (MT) from last year at a combined total of 1.044 million MT, while Mexico's crop is expected to fall 377,000 MT to just 600,000 this season.

With output expected to fall over a million MT throughout the North American continent, this is both the largest year over year change in the size of the dry edible bean harvest; and the first time in over 20 years that dry edible bean output in the region will drop under two million MT.

Not surprisingly, this has created a "made in North America" market for dry edible beans, with regional prices holding a stiff premium to world trading levels. Though the North American region is expected to import more product from other parts of the world in 2011–12, the quantities will have a greater tendency to moderate price gains than to force prices sharply lower.

Farmers will respond to current market conditions. At a minimum, most land intended to be planted to edible beans in 2011 will be seeded this year. What is less certain is whether the strong price performance for edible beans will succeed in drawing land from grains and oilseeds.

Barring another long spring thaw, dry edible bean plantings in Canada and the United States should come in around two million acres this spring, with the potential for a larger increase. Five-year average yields would see production leap from just over one million MT last year to over 1.5 million.

If the current drought in Mexico breaks, there could be a significant increase in dry edible bean seedings in that country this year, with seeded area possibly increasing from 2.9 to 3.5 million acres. Production in Mexico could jump from a forecast 600,000 to just under one million MT in the coming season. That could moderate demand for beans from Canada and the United States, and would allow the Mexican government to not extend this year's duty-free quota for beans grown outside the North American Free Trade Agreement (NAFTA) zone.

In January, Mexico auctioned 100,000 MT of duty-free import quotas to local traders. That saw a steep increase in demand for Argentine origin black beans. However, with Argentina virtually sold out of 2011 crop beans, there is a lot of speculation that Mexico will make it easier for companies to import beans directly from China instead of "buying U.S. beans" that were "replaced by Chinese beans."

Even with the imports, there is a real fear that current production problems in Mexico will hasten the decline in per capita dry edible bean consumption in that country. Other than in the past couple of years, prices for dry edible beans should not have been a major factor affecting how many the average Mexican eats each year. A more important problem has been a general decline in interest in growing dry edible beans in North America.

The combined seeded area for the three countries averaged 6.95 million acres during the last half of the 1990s. Between 2005 and 2009, the average annual bean area had plunged to just under 5.5 million acres; and it is forecast to drop to an averaged 5.32 million acres between 2010 and 2014. Yields are not increasing quickly enough to

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investment and suitable skilled labour is essential to the innovation process.

The single most important factor impeding innovation and R&D in food processing is the lack of internally-generated cash flow. Establishments that do not have enough internal cash flow to spend on innovation and R&D depend on external funding sources such as banks, cooperatives and credit unions, Canadian-based venture capital and the government.

Price transparency as well as price discovery will lead to quick, informed decisions, increased cash flow and overall economic security. The development of applicable programs to translate raw data into simple digestible information is key to a more equitable market for all involved with bringing food from the field to the table.

What decision support and democratized pricing means for all parties involved, is easy access to more relevant information, including what the competition is doing and how that will effect the local market in the future, in a timely manner. More people will have the right mission critical data to make fiscally sound choices. And by doing so, in a timely manner, it will maximize profitability and cash flow with the end result being economic security. This technology will easily provide pest and disease monitoring, price management, integrated weather and crop forecasting models, as well as buyer demand feedback.

By combining all of this information in a meaningful way, it will act like a personal recommendation from the guy "in the know," and helps make economic decisions relatively easy to make. This is where the future is headed. More specific information, narrowly focused on the end users, to their benefit. So, the farm that is used to thinking locally cannot only think globally, but also become a player in the world marketplace.

The quotes re. Australia come from the *Sydney Morning Herald*, November 16, 2006 *http://www.smh.com.au/news/national/wheat-imports-loom-as-drought-bites/2006/11/14/1163266550301.html*

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offset the impact of lower seeded area on production. This has seen the average annual production in the there countries drop from 2.78 million metric tons the last half of the 1990s to 2.54 million MT between 2005 and 2009 and a forecast 2.32 million metric tons between 2010 and 2014.

Farmers are not planting less beans because there is not a market for their production. They are planting less beans because they believe other crops are more profitable. In Manitoba, there has been a significant shift from edible beans into soybeans. Corn competes aggressively for land use in Mexico, while corn and soybeans have displaced edible beans in parts of the United States and China.

Though dry edible bean imports have been trending upward in recent years, it has not reversed the downward trend in per capita consumption in North America. Over the 20-year period ending in 2014, average annual dry edible bean consumption is expected to drop 12% in the United States to 2.98 kilograms per person and plunge over 28% in Mexico to 9.6 kilograms.

The problem facing the dry edible bean industry is that it is easier to lose customers than to win them. The coming expansion in acreage and production will make it seem like here is no reason for concern over shifting eating habits; but it is not likely to be enough to signal a reversal of the current trend.

For farmers, it does not mean that prices will be lower on average for dry edible beans over the medium term. However, the longer production lags the needs of the NAFTA region, the more influence world markets will have on prices being paid to North American farmers. Unfortunately, competing suppliers in China and emerging suppliers in central Europe and Africa, tend to be more aggressive with price

As much as some navy bean importers worry about the sustainability of production in Canada and the United States, food manufacturers and packagers here may start to worry about the sustainability of production for more than just white beans.

Average Annual Dry Edible Bean Situation

	1995–99	2000–04	2005–09	2010–14
Area (acres)				
Canada	268,000	453,000	394,000	272,000
United States	1,960,000	1,583,000	1,568,000	1,598,000
Mexico	4,724,000	4,436,000	3,528,000	3,450,000
Total	6,952,000	6,473,000	5,489,000	5,320,000
Production (metric tons)				
Canada	201,000	312,000	296,000	212,000
United States	1,373,000	1,063,000	1,161,000	1,202,000
Mexico	1,208,000	1,243,000	1,081,000	909,000
Total	2,782,000	2,618,000	2,538,000	2,323,000
Per Capita Consumption (kg)				
United States	3	3	3	3
Mexico	13	12	12	10

MANITOBA PULSE BUYER LIST – FEBRUARY 2012

B–Beans, F–Faba Beans, L–Lentils, P–Peas, S–Soybeans

Company	Commodity	Phone	City/Town	CGC Registered
Agassiz Feeds	P	204-638-5840	Dauphin, MB	N
Agassiz Global Trading	B, S	204-745-6655	Homewood, MB	N
AgriTel Grain Ltd.	P, S	204-268-1415	Beausejour, MB	N
Alliance Pulse Processors Inc.	B, P, L, S	306-525-4490	Regina, SK	Y
• SaskCan Pulse Trading – Parent Division	B, P, L, S	204-737-2625	St. Joseph, MB	Y
All Commodities	P, L	204-339-8001	Winnipeg, MB	Y
B.B.F. Enterprises Ltd.	S	204-737-2245	Lettellier, MB	N
B.P. & Sons Grain and Storage Inc.	S	204-822-4815	Morden, MB	N
Belle Pulses Ltd.	P	306-423-5202	Bellevue, SK	Y
Best Cooking Pulses Inc.	P, L	204-857-4451	Portage la Prairie, MB	Y
Brett-Young Seeds	P, S	204-261-7932	Winnipeg, MB	N
CB Constantini	P	604-669-1212	Vancouver, BC	Y
Cargill Ltd.	P	204-947-6219	Winnipeg, MB	Y
Delmar Commodities	S, P	204-331-3696	Winkler, MB	Y
• Jordan Mills	S	204-331-3696	Winkler, MB	Y
Global Grain Canada	B	204-829-3641	Plum Coulee, MB	Y
Hensall District Co-op	B	204-295-3938	Winnipeg, MB	Y
Horizon Agro	S	204-746-2026	Morris, MB	Y
Hytek Ltd.	P	204-424-2300	La Broquerie, MB	N
JK Milling Canada Ltd.	P	306-586-6111	Regina, SK	Y
JRS Commodities	S	204-327-5582	Gretna, MB	N
Kalshea Commodities Inc.	P	204-737-2400	Altona, MB	Y
Kelley Bean Co. Inc.	B	308-635-6438	Scottsbluff, NE	N
Linear Grain	B, S, P	204-745-6747	Carman, MB	Y
Natural Proteins	S	204-355-5040	Blumenort, MB	N
Nutri-Pea Ltd.	P	204-239-5995	Portage la Prairie, MB	N
Nu-Vision Commodities	B	204-758-3401	St. Jean Baptiste, MB	N
Parrish & Heimbecker Ltd.	P	204-987-4320	Winnipeg, MB	Y
Paterson Grain	P, S	204-956-2090	Winnipeg, MB	Y
Quarry Grain Commodities	S	204-467-8877	Stonewall, MB	N
R-Way Ag Ltd.	P, S	204-379-2582	St. Claude, MB	N
Richardson International	P	204-934-5627	Winnipeg, MB	Y
• Richardson Pioneer Ltd.	P, S	204-934-5627	Winnipeg, MB	Y
• Tri Lake Agri	P	204-523-5380	Killarney, MB	Y
Roy Legumex	B, F, L, P, S	204-758-3597	St. Jean Baptiste, MB	Y
• Fisher Seeds Ltd.	F	204-622-8800	Dauphin, MB	Y
• Duncan Seeds	B	204-822-6629	Morden, MB	Y
S.S. Johnson Seeds	P, B	204-376-5228	Arborg, MB	Y
Seed-Ex Inc.	S	204-737-2000	Letellier, MB	Y
Shafer Commodities	S	204-822-6275	Morden, MB	Y
Southland Pulse	P	306-634-8008	Estevan, SK	Y
Sunrich LLC	S	507-446-5642	Hope, MN	N
Thompsons Limited	B, P, L	519-676-5411	Blenheim, ON	Y
• Keystone Grain	S	204-325-9555	Winkler, MB	Y
• Circle T Agri Services	B	204-723-2164	Treherne, MB	Y
• Y2K Farms	B	204-252-2132	Edwin, MB	Y
Vanderveen Commodity Services	S	204-745-6444	Carman, MB	Y
Viterra	P, S	204-954-1528	Winnipeg, MB	Y
Viterra Special Crops	B, F, L, P	204-745-6711	Carman, MB	Y
• Receiving Station	B	204-856-6373	Portage la Prairie, MB	Y
• Plum Coulee	B	204-829-2364	Plum Coulee, MB	Y
• Prairie Mountain Agri Ltd.	P	204-937-6370	Roblin, MB	Y
Walhalla Bean Co. (Canada Ltd.)	B	701-549-3721	Walhalla, ND	Y
• Winkler Receiving	B	204-325-0767	Winkler, MB	Y
Walker Seeds Ltd.	P	306-873-3777	Tisdale, SK	Y

To be included on our Manitoba Buyers List, companies should contact the MPGA office at 204-745-6488 to register.

NOTE – These companies are authorized to deduct and remit levy to MPGA. This list is provided by MPGA as a convenience to our members. **MPGA accepts no responsibility or liability for the accuracy of the completeness of the information provided**. It is your personal responsibility to satisfy yourself that any company you deal with is financially sound. Questions regarding licensing and security should be directed to the Canadian Grain Commission at 1-800-853-6705 or 1-204-983-2770.

RECIPE CORNER

Blueberry-Lemon Quick Bread (gluten-free)

Makes 12 Servings

¾ cup (175 mL) EACH yellow pea flour

¾ cup brown rice flour blend*

¾ cup (175 mL) sugar, plus 1 Tbsp (15 mL) for topping

1 Tbsp (15 mL) baking powder

1 tsp (5 mL) xanthan gum

¾ tsp (4 mL) table salt

1 cup (250 mL) milk of choice, room temperature

½ cup (125 mL) canola oil

1 tsp (5 mL) vanilla

2 large eggs, room temperature

3 tsp (15 mL) lemon zest, divided

1 cup (250 mL) blueberries, fresh or frozen

½ cup (125 mL) sliced almonds, plus 1 Tbsp (15 mL) for topping

1. Preheat oven to 375°F/190°C. Generously grease 8 x 4-inch nonstick metal loaf pan.
2. In medium mixing bowl, whisk together yellow pea flour, flour blend, sugar, baking powder, xanthan gum and salt. With electric mixer on low speed, beat in milk, oil, vanilla, eggs and 2 tsp (10 mL) lemon zest until batter thickens slightly, about 30 seconds. Mix in blueberries and almonds.
3. Spread batter evenly in pan. Combine remaining sugar, lemon zest and almonds; press on top of bread. Let stand for 10 minutes.
4. Bake until loaf browns and a toothpick inserted into the centre comes out clean, about 55–60 minutes. Lay foil over loaf after first 20–30 minutes to prevent overbrowning. Cool bread in pan for 10 minutes, then on wire rack.

Apple Crisp (gluten-free)

Makes 6 servings

Fruit

5 large Granny Smith apples

Zest and juice of 1 lemon

2 Tbsp (25 mL) sugar

1 tsp (5 mL) vanilla extract

Topping

½ cup (125 mL) chickpea flour

3 Tbsp (45 mL) EACH packed brown sugar, granulated sugar

¼ cup (50 mL) chopped walnuts (optional)

½ tsp (2 mL) cinnamon

¼ tsp (1 mL) ground nutmeg

⅛ tsp (dash) ground cloves

⅛ tsp (dash) table salt

6 Tbsp (90 mL) unsalted butter or buttery spread

1 cup (250 mL) vanilla ice cream (optional)

1. Place rack in middle of oven. Preheat oven to 350°F/180°C. Coat 8 x 8-inch baking dish with cooking spray.
2. Peel, core and thinly slice apples. In large bowl, toss apples with lemon zest and juice, sugar and vanilla. Place in baking dish.
3. In same bowl, whisk chickpea flour, brown sugar, granulated sugar, walnuts, cinnamon, nutmeg, cloves and salt with whisk until blended. Cut in butter with a fork until mixture forms small clumps and sprinkle evenly over apples.
4. Bake 40–45 minutes or until topping is crisp and browned. Serve warm, with vanilla ice cream.

*Brown Rice Flour Blend

1½ cups (375 ml) brown rice flour

1½ cups (375 ml) potato starch

1 cup (250 ml) tapioca flour – *also called tapioca starch*

Blend thoroughly. Store, tightly closed, in dark, dry place.

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