ONTARIO Bean GROWERS

Research Report

2021-22

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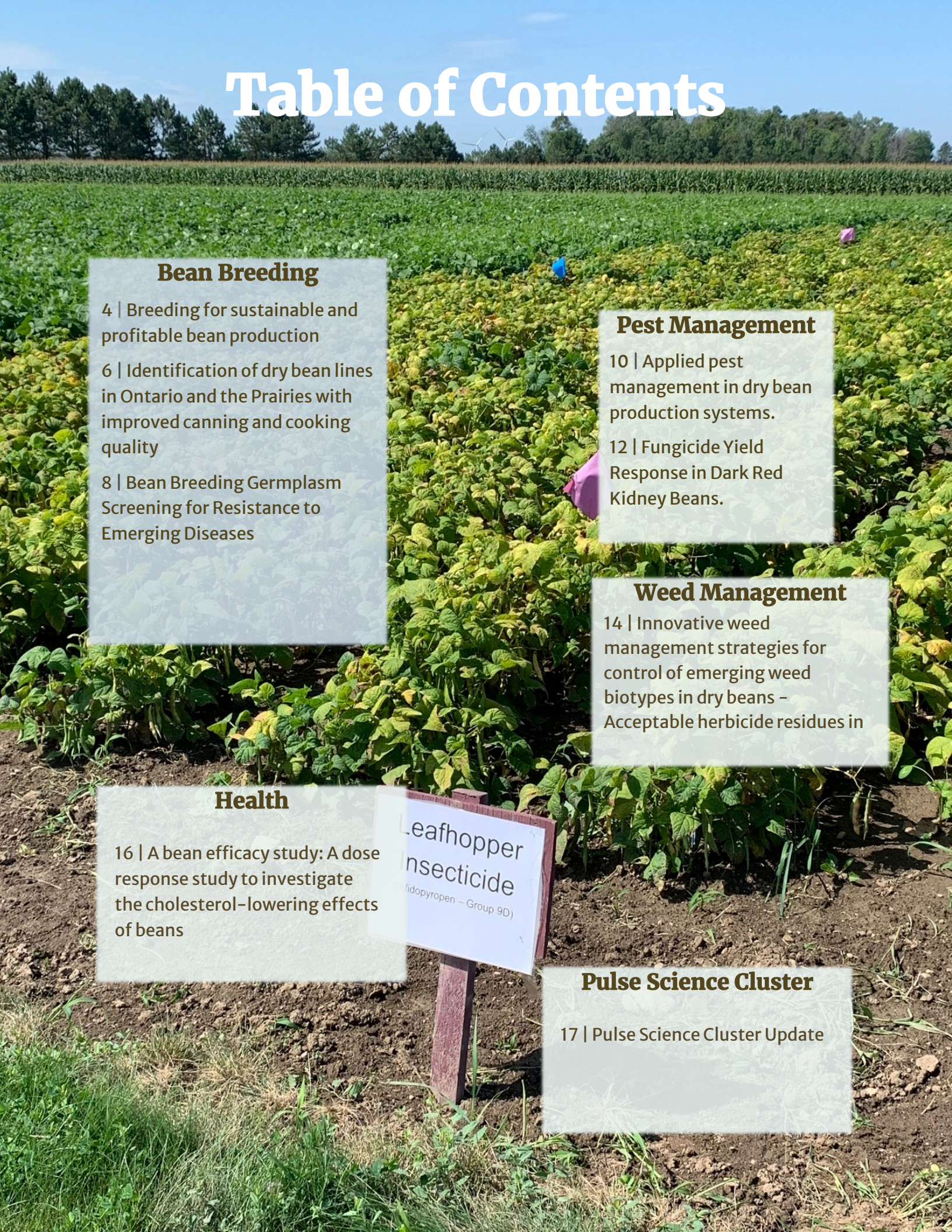

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Annual Research Report

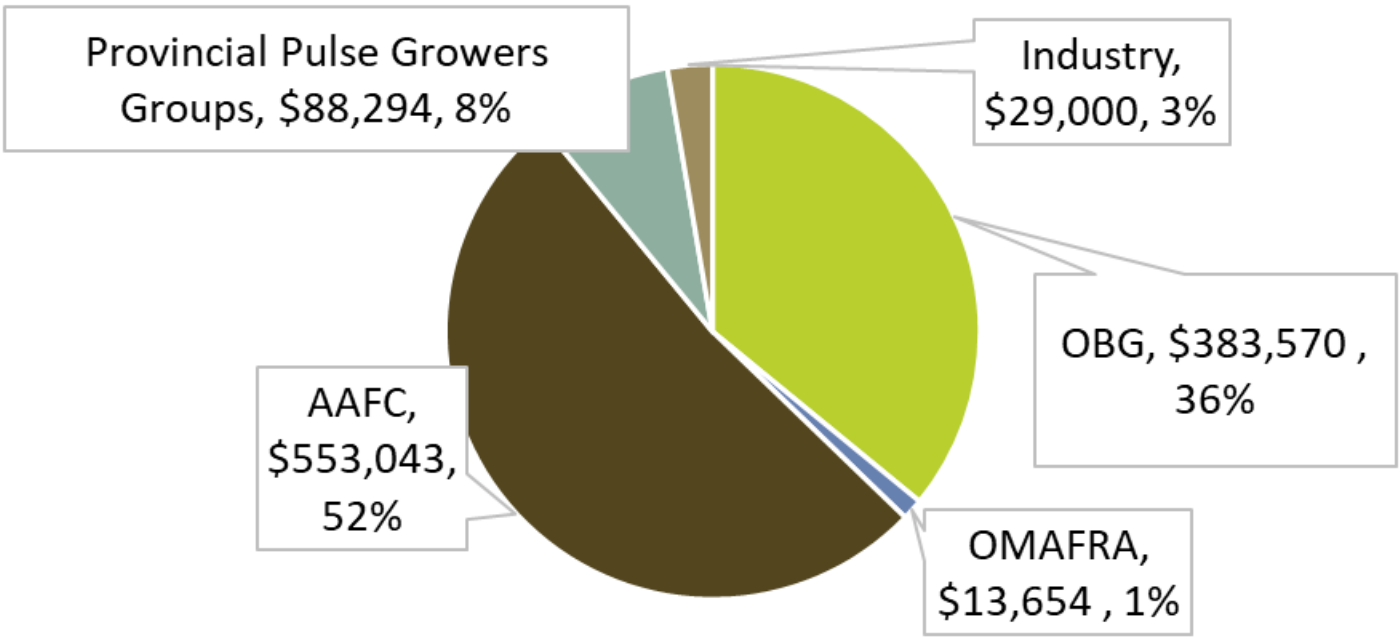
2021-22

The Ontario Bean Growers are very pleased to share our annual research report. OBG invests 50% of your license fees into research so it is our hope that the detail provided in this report will demonstrate how your check-off dollars are returning value to you.

Please note that this report covers OBG's fiscal year from September 1, 2021 to August 31 ,2022

Leveraged Research Dollars 2021-22

This includes funds leveraged through the Pulse Science Cluster that do not flow through OBG's books.

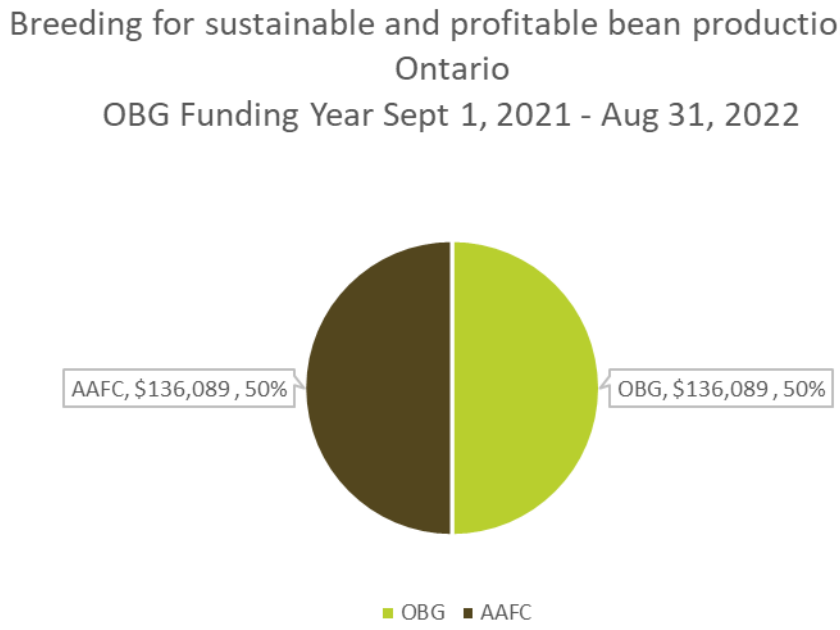


Total research spending, including leveraged dollars, $1,067,471

Bean Breeding

Project Title: Breeding for sustainable and profitable bean production

Dr. K. Peter Pauls
University of Guelph



Year	OBG	AAFC
18-19	136,088	136,089
19-20	136,088	136,089
20-21	136,089	136,089
21-22	136,089	136,088
22-23	136,089	136,088
Total	680,443	680,443

Total Project Funding over 5 years

$1,360,886

Breeding better beans means looking at sustainability and profitability

By Lilian Schaer

Over the past five years, 20 new bean varieties in various market classes have been released and commercialized in North America. That's as a result of work by University of Guelph bean breeder Prof. Peter Pauls and his team through a research project that is part of a five-year investment into bean research by Ontario Bean Growers and the Pulse Research Cluster.

For the last five years, Pauls' work has focused on mining the diversity of Canada's bean breeding germplasm to identify genes that control yield, disease resistance, and nitrogen fixation capacity, as well as bean quality characteristics like nutritional value, health-promoting properties and visual appeal. He works with primarily navy, black, kidney, cranberry and pinto beans.

"Yields in Ontario bean fields have doubled in the last 30 years. Breeding has produced lines with increases in yielding potential, disease resistance and harvestability, and there have been agronomic improvements too," says Pauls. "We have a lot of new varieties in different market classes and I encourage bean growers to look at the data that's out there and shift to growing those new varieties. If you're growing the same materials you grew 10 years ago, you're not taking advantage of the advances that are happening."

One such example is the dark red kidney bean Dynasty. Based on a five-year average, it has consistently out-performed competitive varieties by more than 600 pounds per acre, which represents $300 per acre more to producers growing Dynasty instead of other varieties.

"Based on 15,000 acres of Dynasty grown in Ontario,

that's a benefit of over $4 million to growers from just the additional yield bump that variety delivers," says Pauls.

Dynasty's impact on the industry was recognized in 2022 with the Seed of the Year award.

Improving the sustainability of bean production has influenced Pauls' work in both disease resistance and nitrogen fixation. That means identifying beans with resistance common bacterial blight and anthracnose, diseases that can cause significant losses for growers. Anthracnose-resistant beans don't need to be treated with fungicides, which benefits the environment and reduces grower production costs.

According to Pauls, if plants can "fix" or produce their own nitrogen without decreasing bean production, it would result in a more environmentally sustainable crop that would also cost farmers less to grow. He's been particularly interested in heritage bean varieties that are less accustomed to high fertilizer levels as modern beans.

"The big Achilles heel for beans is that we use fertilizer, but we've looked at a range of capabilities in our germplasm and the potential to fix all the nitrogen that beans need ranges from 20% in some varieties to well over 70% in others," he explains. "It is a complex job but has a big pay off if we could grow dry beans like soybeans where no nitrogen is used."

Pauls' research also focuses on other bean characteristics, like protein content, and how beans can interact with human health. Beans are an excellent source of protein as well as compounds that have beneficial health impacts like reducing the risk of cardiovascular disease or helping to control diabetes.

The team has also been working on solving the problem of beans darkening after harvest, particularly in pinto and cranberry beans. Beans that have darkened take longer to cook and consumers associate them with being old.

"There is now a trend to varieties that don't turn brown and we've utilized a gene source that slows browning and identified one that prevents it," Pauls says. "We've done some taste and cooking tests on non-darkening beans, and they were preferred by consumers over darkening varieties. For producers, it means beans will keep their value after harvest."

Two non-darkening pinto beans have been commercialized, and a non-darkening cranberry line is close to being licensed.

There is much yet to be discovered though, and Pauls hopes to continue this research under the next Pulse Research cluster. Bean breeding is a long game: it takes six years before promising lines can be moved into two years of provincial trials that include cooking and canning tests. From there, successful varieties are registered and made available to companies for licensing and seed production.

"We are being encouraged in many ways to look at sustainability, which to me means producing crops in a way that looks to the future to be able to continue to produce them, like building up soil health and paying attention to the environment," he says. "Growers have long been doing that but it's now increasingly a focus of non-farming consumers, so ongoing research is important to help growers produce high yielding crops that support a diverse ecological community."

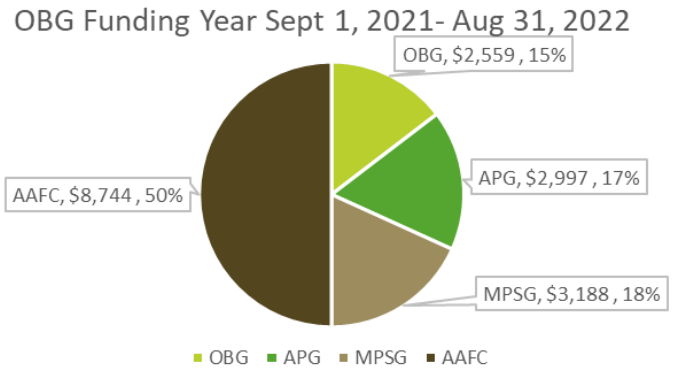
The Pulse Research Cluster includes Ontario Bean Growers, Alberta Pulse Growers, Manitoba Pulse and Soybean Growers, Saskatchewan Pulse Growers and Pulse Canada and is supported by the Agriculture and Agri-Food Canada AgriScience Clusters Program under the Canadian Agricultural Partnership.

Each year the University of Guelph Bean Breeding Program hosts an open house at the Elora Research Station. The 2023 Open House will take place on August 24 and is free for growers to attend.

Bean Breeding

Project Title: Identification of dry bean lines in Ontario and the Prairies with improved canning and cooking quality

Dr. Parthiba Balasubramanian, Agriculture and Agri-Food Canada



Year	OBG	MPSG	APG	AAFC
18-19	2,559	3,188	2,997	8,745
19-20	2,559	3,187	2,997	8,744
20-21	2,558	3,188	2,998	8,745
21-22	2,559	3,189	2,997	8,744
22-22	2,559	3,188	2,997	8,744
Total	12,794	15,942	14,986	43,722

Total Project Funding over 5 years

$87,444

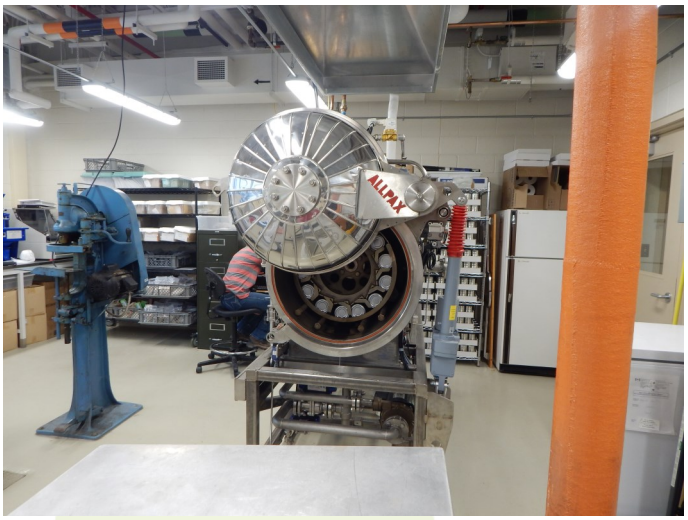
Prepared by: Nate Ort, M.Sc.

Photo Credits: Dr. Parthiba Balasubramanian

This project led by Dr. Parthiba Balasubramanian of Agriculture and Agri-Food Canada (AAFC) in Lethbridge, Alta. assessed dry bean canning and cooking quality from registration trials in Ontario, Manitoba, Saskatchewan, and Alberta. The preferences of harvested dry bean by consumers and processors is dependent on the characteristics of the physical seed (size, shape, color, colour retention, and seed coat integrity) as well as the processed seed (canning and cooking) quality traits. The objective of this research project was to assess dry bean lines grown in Ontario and Western Canada for canning and cooking quality characteristics in the Bean Pilot Plant at AAFC Lethbridge Research and Development Centre. The proportion of hard seeds, often referred to as "stone seeds", ability to absorb water, washed drain weight, and the seed texture, colour, clumping, and appearance are important characteristics of harvested dry bean seed to processors and consumers. Dry seed quality characteristics such as colour, size and shape are evaluated in dry bean breeding programs early in the breeding pipeline, however not until several generations later are the cooking and canning quality traits evaluated in yield

Bean seeds soaking in the Bean Pilot Plant at the AAFC Lethbridge Research and Development Centre.

trials, when there is enough seed available for processing. Advanced yield trials were conducted in 2021 in Ontario for 73 dry bean lines (35 navy, 14 black, six otebo, six kidney, and 12 cranberry) and were evaluated for their canning and cooking quality. A summary of data and discussions were provided to dry bean breeders in Ontario and this information will be used to decide which varieties will advance to the



The Rotary Canner at Bean Pilot Plant at the AAFC Lethbridge Research and Development Centre was purchased a number of years ago with grower funds leveraged through the Pulse Science Cluster.

2022 Ontario Registration Trials. The 2021 Registration Trials evaluated included 76 dry bean lines (20 navy, 11 cranberry, five dark red kidney, three light red kidney, two white kidney, 12 black, one red, six yellow, and 16 pinto bean) at three locations in Ontario; nine dry bean lines (five pinto and four great northern bean) at three locations in Alberta; eight dry bean lines (two pinto, three yellow and three black bean) at two locations in Saskatchewan; and 22 dry bean lines (three navy, two black, two yellow, four cranberry, two light red kidney, four dark red kidney, two great Northern, and five pinto bean) at three locations in Manitoba. For Ontario, a thorough analysis and acceptability recommendations of dry bean lines for cooking and canning quality traits were sent to dry bean breeders, and they were discussed at the Ontario Pulse Crop Committee in early 2022 for their consideration when selecting promising varieties for registration and commercialization in Canada. For Manitoba, Saskatchewan, and Alberta

Navy beans being put through their paces in a trial with tomato sauce.

the information collected from registration trials was discussed at the Prairie Recommending Committee for Pulse and Special Crops annual meeting when requesting support for registration of candidate varieties best suited to prairie growing environments. Recommendations on the canning and cooking quality of promising varieties were considered by the two National Registration Recommending Committees: the Ontario Pulse Crop Committee (11 varieties) and the Prairie Recommending Committee for Pulse and Special Crops (nine varieties). Key Findings • Seed quality information collected in 2021 and previous years was used to support the registration of dry bean lines in Ontario and Western Canada. • Lines in advanced yield and registration trials were evaluated for their canning and cooking quality traits. These data will be used by breeders to select dry bean lines with improved canning and cooking quality traits in the dry bean breeding program for both generation advancement and for use as parents in the hybridisation nursery.

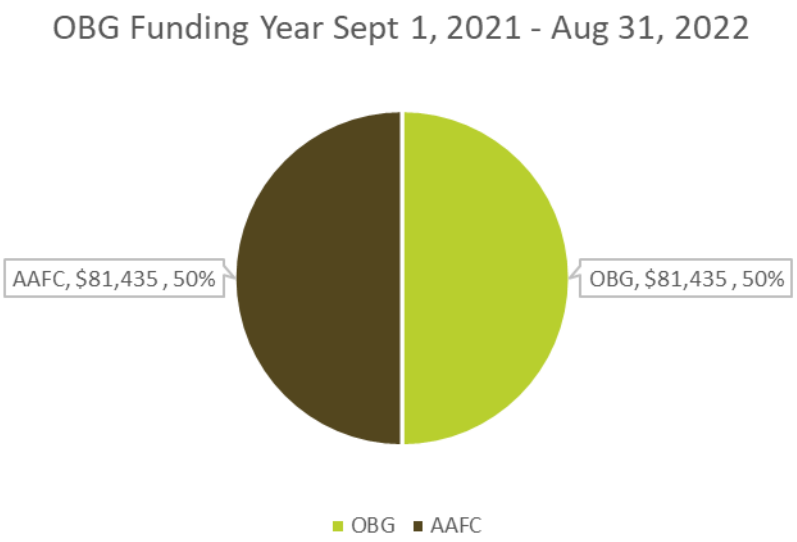
As part of the knowledge and technology transfer requirements for the Agri-Science Cluster, the Pulse Cluster commissioned this video, The Story of Beans, highlighting the work of Dr. Balasubramanian's lab.

Click here to view The Story of Beans

Bean Breeding

Project Title: Dry bean disease screening and development of germplasm with disease resistance

Dr. Jamie Larsen
Agriculture and Agri-Food Canada



Year	OBG	AAFC
18-19	62,751	62,751
19-20	75,836	75,835
20-21	77,320	77,321
21-22	78,855	78,855
22-22	81,435	81,435
Total	376,197	376,197

Total Project Funding over 5 years

$752,394

Getting closer to blight-resistant dry bean varieties

By Lilian Schaer

Ontario bean growers are several steps closer to being able to grow blight-resistant dry bean varieties in the province. That's thanks to outcomes from a research project funded by the Ontario Bean Growers and the national Pulse Research Cluster.

Dr. Jamie Larsen, a research scientist at the Agriculture and Agri-Food Canada (AAFC) Research Centre in Harrow, Ontario led a team that has used three genetic markers for Common Bacterial Blight (CBB) – and two of those markers are also linked to resistance for Bacterial Brown Spot (BBS).

These diseases are two of the most common problems affecting dry bean production, causing yield loss and driving up production costs for growers. They're also hard to distinguish from each other in the field, making it hard for farmers to determine exactly which bacterial disease they're dealing with.

The team found that although they aren't as resistant as navy beans, kidney or large bean lines resistant to CBB are also showing resistance for BBS. A similar pattern has emerged in small-seeded coloured beans like black, red and pinto.

"Overall, what this means for growers is that they should use CBB resistant varieties because they're also BBS resistant," Larsen says. "The next step is breeding and looking at bringing the resistance into more bean varieties. Our breeding program is an aggregator – we are finding out what's resistant and using that material."

The team is getting close to having some new lines ready for registration that have both yield performance and resistance, and Larsen notes that the breeding pipeline is full and robust for the coming years.

A big part of the five-year project was also making improvements to the disease testing nurseries for CBB, Root Rot and White Mould that Larsen and his

colleagues manage to survey bean germplasm for the AAFC and University of Guelph breeding programs, as well as industry breeders.

Data generated from the nurseries is used to make selection decisions and the improvements mean more consistent data can flow to industry and collaborators, speeding up the bean breeding process.

Bacterial Brown Spot Symptoms

"A farmer might not get that excited about this, but that consistency in disease testing is critical to getting resistance into varieties," Larsen adds. "You get one shot at it over the growing season and through this project we had five chances to get it right. We made progress especially with white mould and root rot screenings, so that's a major outcome."

Owen Wally, an AAFC research scientist in field crop pathology, will be leading a new root rot and soybean cyst nematode project for dry beans that will help improve testing methods for use both in the field and indoors to further improve testing consistency.

Long term, the goal is to reduce pesticide use in dry bean production, which will be both beneficial for the environment and reduce production costs for growers. In the case of white mold, for example, most growers spray their crop twice a year, but resistant genetics can cut that in half or eliminate it entirely, notes Larsen.

Disease resistant varieties also mean the ability to have more bean seed produced here in Ontario, which would also reduce costs for growers. Although some is grown locally, the majority of bean seed currently comes from Idaho due to disease pressures in the province. Bringing dry bean seed production back to Ontario for every market class is a move that could reduce seed costs by approximately $10 to $15 per acre.

"In the future, having seed production in Ontario is not just more cost effective, but it also gives growers protection against supply chain challenges in the form of safety of supply or seed security," he adds. "We were starting this program almost from scratch five years ago and although the pandemic has slowed down some of our ability to do things, we've seen some tremendous progress in helping us meet long term goals."

In addition to Wally, Larsen also worked on this project with graduate student Caio Rodrigues – whose research was supervised by Dr. Chris Gillard, Associate Professor in dry bean agronomy and pest management at the University of Guelph Ridgetown Campus – research technician Emily Morneau, and Frédéric Marsolais, a research scientist at the AAFC Research Centre in London. Larsen also collaborated with Prof. Peter Pauls at University of Guelph.

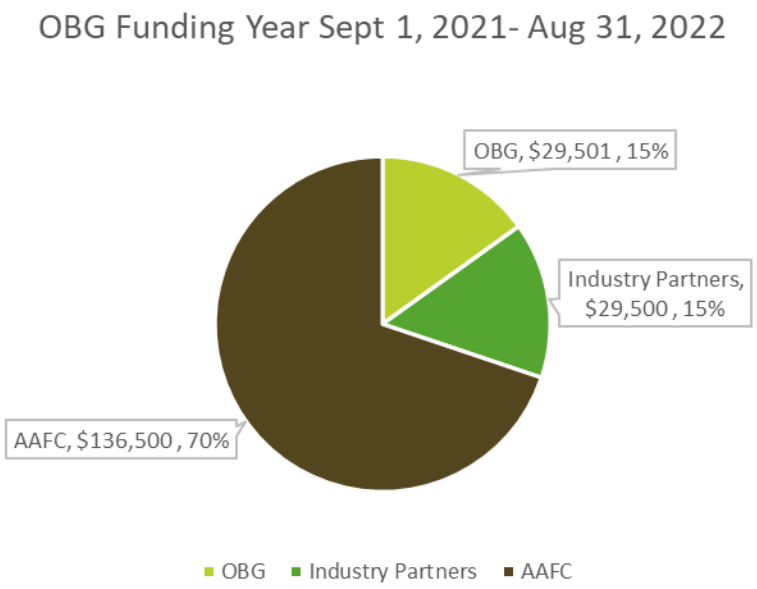
Inoculating the Common Bacterial Blight nursery.

The Pulse Research Cluster includes Ontario Bean Growers, Alberta Pulse Growers, Manitoba Pulse and Soybean Growers, Saskatchewan Pulse Growers and Pulse Canada and is supported by the Agriculture and Agri-Food Canada AgriScience Clusters Program under the Canadian Agricultural Partnership.

Pest & Disease Management

Project Title: Applied pest management in dry bean production systems

Chris Gillard
University of Guelph, Ridgetown Campus



Year	OBG	AAFC	Industry
18-19	29,500	136,501	29,500
19-20	29,500	136,501	29,500
20-21	29,501	136,501	29,500
21-22	29,500	136,500	29,500
22-22	29,501	136,500	29,500
Total	147,502	409,501	145,000

Total Project Funding over 5 years

$975,005

Research determines effective, economical pest management solutions for dry beans

By Lilian Schaer

Research into pest management products for dry beans has yielded some key insights for Ontario growers dealing with common bean diseases like white mold and anthracnose.

The work, led by Chris Gillard, Associate Professor in dry bean agronomy and pest management at the University of Guelph Ridgetown Campus, included evaluating fungicide efficacy and developing recommendations for controlling new pests.

According to Gillard, white mold is the biggest disease issue for Ontario dry bean growers. Three quarters of growers consider it the single biggest problem in their bean crop, with fungicides a key part of the tools they use on a routine basis. That's where Gillard's work in unbiased, arms-length reviews of new pest

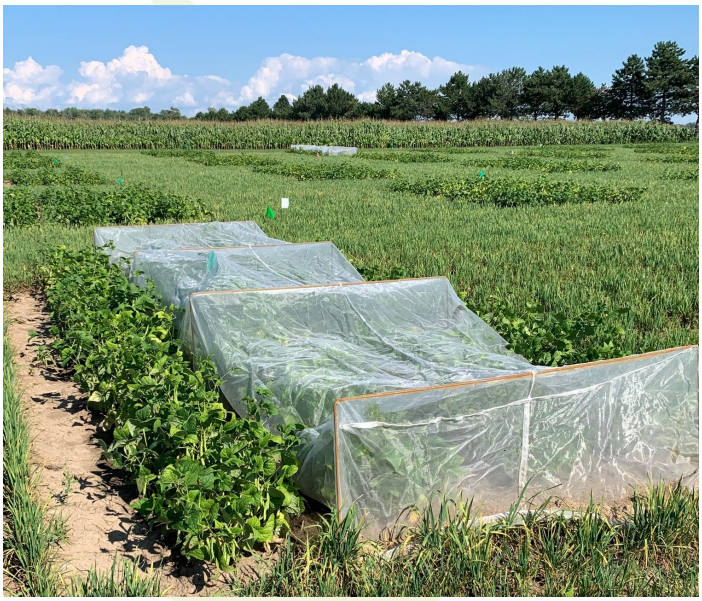
White mold at Huron Research Station, 2022.

Photo: Don Depuydt

management tools helps growers with decision-making on the farm.

"A key takeaway for growers from this work is that good white mold fungicides will pay a return. Choosing the right product and putting it on at the right time will protect the yield of the crop – the bigger the yield potential, the better the chance of response," he says.

It is often growers who bring new product options to Gillards's attention for testing. Over the last five years of the research cluster, Gillard and his team have



A plot of caged dry beans in a field artificially infested with western bean cutworm (WBC). This pest is highly mobile, and the caged treatment enables damage from the natural overwintering population – rather than artificially infested WBC that have moved in from other plots – to be assessed .

tested nine products and found none of them to be equal to the two standards in the marketplace, Allegro and Propulse. His work also resulted in a label expansion for Allegro to include anthracnose control and showed that time of day for application doesn't influence the effectiveness of the product.

"The vast majority of growers are listening to our research results and using the two products that we recommend as standards, and our work has had a dramatic impact; we can reduce disease by 50% or more and increase yield by 75% or more, which influences net returns by $400 an acre or more," he says.

"I believe fungicides are a key component for management of diseases like white mold and anthracnose and we need to continue to monitor products in the marketplace that are being promoted for management of these pests to make sure they really are efficacious and economical," he adds.

Gillard's work through the cluster project also included looking at controlling a new pest affecting Ontario bean growers – Western Bean Cutworm (WBC). It's a moth originally from the U.S. Midwest that has been moving steadily east since the late 1990s, feeding on corn cobs and bean seeds during its immature larvae stage.

It's almost impossible to detect WCB in dry beans as the larvae feed at night and hide in the soil during the day, so Gillard was hoping to develop a predictive model for growers to determine the best time apply insecticide, but results haven't been clear to date.

"We can see holes in the pods once leaf drop has happened, but I've seen three to five percent of pods with holes and of those, only 30 per cent of the beans are affected. Overall, that's maybe two percent damage, so does that make it economical to spray?" he notes. "Western Bean Cutworm is not a simple problem to fix so it will take a coordinated approach to figure it out. It will be a thorn in the side of growers, but it won't be a major problem in my opinion."

Moving forward, Gillard does believe dry bean growers will need to pay more attention to another pest, Soybean Cyst Nematode. There's no "solution in a jug" currently available, so growers will need to sample their fields to know what they have and learn how to manage it. At the same time, research on genetic tolerance is moving ahead with Gillard collaborating with Agriculture and Agri-Food Canada bean researchers Dr. Jamie Larsen and Dr. Owen Wally at Harrow on finding and identifying genetic markers.

"This is a key pest moving forward in beans and very little work has been done in dry bean genetics to date," he says. "This is the number one soybean pest in the United States so we should be able to build on a lot of the work already done in soybeans.

These projects are all part of a five-year research investment into bean research projects by Ontario Bean Growers and the national Pulse Research cluster.

The cluster also includes Alberta Pulse Growers, Manitoba Pulse and Soybean Growers, Saskatchewan Pulse Growers and Pulse Canada and is supported by the Agriculture and Agri-Food Canada AgriScience Clusters Program under the Canadian Agricultural Partnership.

Pest & Disease Management

Project Title: Fungicide Yield Response in Dark Red Kidney Beans

Total Project Funding for 1 Year: $2,600

In 2022 OBG decided to explore opportunities to invest in private research and contracted with Black Creek Research to evaluate yield response under natural background pressure (i.e. not inoculated or irrigated) in white mould fungicide programs in dark red kidneys. This year there was very low disease pressure.

We will be repeating this trial in 2023.

Treatments:
1. Untreated check
2. Propulse @ 750 mL/ha
3. Allegro @ 800 mL/ha
4. Allegro @ 600 mL/ha + Quadris @ 500 mL/ha

Application Timings:

2 applications made
Early flower – 20-Jul-2022
20 DAA – 9-Aug-2022

The plan was to make one application but apply a second application if weather was conducive for disease development.

Second application was made early August because it actually started to rain.

Disease Pressure:

10 plants per plot assessed
0-3 rating scale
% incidence and Severity Index calculated
Very low disease pressure present

Treatment	White Mould				
	0-3 Scale	% Incidence		Severity Index (%)	
UTC	0.3	15	a	10	a
Propulse	0	0	b	0	b
Allegro	0	0	b	0	b
Allegro + Quadris	0	0	b	0	b
Tukey's HSD p=.10					

Yield:

Harvested: 26-Oct-2022
Center 2 rows of each plot were harvested
Overall yields were low due to dry weather all summer

Treatment	Yield		
	Moisture (%)	Yield (lb/acre)	
UTC	14.4	2060	-
Propulse	14.3	2351	-
Allegro	14.4	2466	-
Allegro + Quadris	14.8	2367	-
Tukey's HSD p=.10			

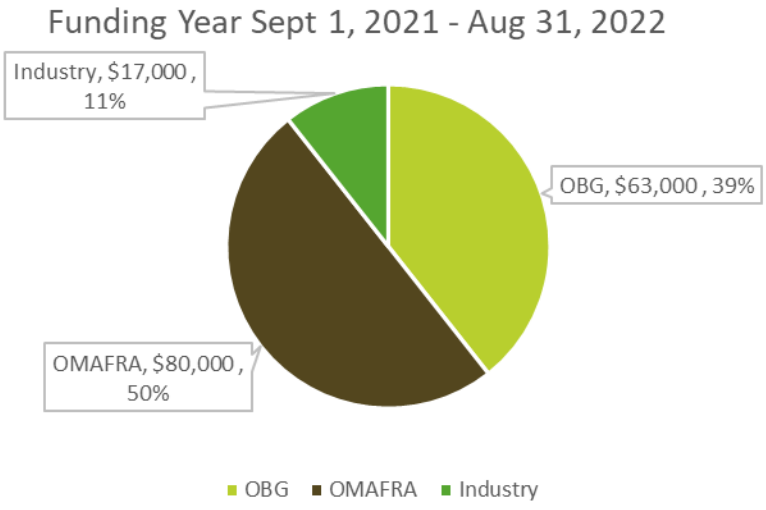
Results:

- Overall, the weather was extremely dry all season at this site.
- Yields were low due to the dry weather
- No disease pressure present in the trial
- Trend for yield increase with a fungicide application without any disease present.

Weed Management

Innovative weed management strategies for control of emerging weed biotypes in dry beans - Acceptable herbicide residues in beans for export markets.

Peter Sikkema, University of Guelph, Ridgetown Campus



Year	OBG	OMAFRA	Industry
2021	63,000	80,000	17,000
2022	63,000	80,000	17,000
2023	63,000	80,000	17,000
Total	189,000	240,000	51,000

Total Project Funding over 3 years

$480,000

Activity 1-1. Dry beans (azuki, kidney, small red, and white) are tolerant to BlackHawk applied preplant. This gives dry bean producers with a starting point for managing glyphosate-resistant Canada fleabane.

Activity 1-2. Phaseolus vulgaris market classes (kidney, small red, and white) are sensitive to flufenacet (Cadou) ad tolerant to acetochlor (Warrant) applied preplant incorporated. Azuki bean is more sensitive.

Activity 1-3. Infinity FX, Pixxaro or Pixxaro + 2,4-D ester applied preplant cause unacceptable injury in dry beans. However, this study supports earlier research that there is an adequate margin of crop safety in dry beans to 2,4-D ester applied 7 days prior to seeding.

Activity 1-4. There is an adequate margin of crop safety in white bean to support the registration of Insight applied alone or in a tankmix with Pardner, Sencor, or 2,4-D applied preplant.

Activity 1-5. There is an adequate margin of crop safety in azuki bean to support the registration of Eragon applied alone or in a tankmix with Pardner, Sencor, or 2,4-D applied preplant.

Activity 2-1. Prowl + Dual + Permit controlled common lambsquarters (87%), wild mustard (100%), redroot pigweed (84%), and common ragweed (78%); Prowl + Dual + Pursuit controlled common lambsquarters (99%), wild mustard (100%), redroot pigweed (96%),and common ragweed (79%). The improved weed control with the Pursuit tankmix was reflected in azuki bean yield.

Activity 2-2. Multiple-herbicide-resistant Canada fleabane control in white bean was as follows: Insight (30%), Insight + Pardner (40%), Insight + Sencor (52%), Insight + Elevore (90%), Insight + 2,4 -D (56%), Insight + Pardner + Sencor (68%), Insight + Pardner + Elevore (82%), and Insight + Pardner + 2,4-D (73%). Further research is needed to address this emerging issue.

Activity 2-3. Multiple-herbicide-resistant Canada fleabane control in azuki bean was as follows:

Eragon (80%), Eragon + Sencor (79%), Eragon + Pardner (78%), Eragon + Elevore (86%), Eragon + 2,4-D (81%), Eragon + Pardner + Sencor (79%), Eragon + Pardner + Elevore (80%), and Eragon + Pardner + 2,4-D (84%).

Activity 2-4. Treflan + Dual + Permit applied preplant incorporated followed by Basagran + Reflex + Assure applied postemergence controlled velvetleaf (99%), common ragweed (100%), common lambsquarters (98%), and annual grasses (96%); Treflan + Dual + Pursuit applied preplant incorporated followed by Basagran + Reflex + Assure applied postemergence controlled velvetleaf (95%), common ragweed (99%), common lambsquarters (96%), and annual grasses (97%). White bean yield was similar to the weed-free control with the two-pass weed control programs evaluated.

Activity 3-1. Desiccation with Eragon (25 g/ha) plus Merge (1 L/ha) in 200 L carrier solution/ha was as follows: green pigweed (100%), common ragweed (97%), and common lambsquarters (46%). Increasing the rate of Eragon to 50 g/ha improved common lambsquarters desiccation to 53%. Doubling the rate of Merge improved common lambsquarters desiccation to 61%. Desiccation was reduced when applied in 100 L carrier solution/ha. There was no improvement in common lambsquarters desiccation with the sequential application of Eragon. Lambsquarters desiccation was reduced when Merge was replace by MSO or UAN.

Activity 3-2. Aim, Axxe and Belouka provided very poor desiccation of common ragweed and barnyardgrass in white bean; Valtera, Eragon, and Insight provided fair desiccation, Ignite provided good desiccation, and Reglone provide excellent desiccation of weeds present at time of application.

Activity 3-3. Homeplate provided very poor desiccation of pigweed species, common ragweed, common lambsquarters, and annual grasses in white bean; Eragon was weak on common lambsquarters and annual grasses, and Roundup + Eragon was weak on annual grasses.

Activity 3-4. Axxe provided very poor desiccation of common ragweed, barnyardgrass, and green foxtail in white bean.

GR Canada Fleabane – White bean

Control

Roundup + Insight + MSO

Roundup + Insight + 2,4-D

Roundup + Insight + Elevore

[View the full 2022 Ridgetown Weed Management Report Here]

(Dry bean trials start on page 73)

Health

A bean efficacy study: A dose response study to investigate the cholesterol-lowering effects of beans

Alison Duncan, University of Guelph

Beans Just May Be the Magical Fruit

Researchers at the University of Guelph say there may be some truth to the old rhyme about "beans, beans, the magical fruit." The results of a recent study demonstrate that eating 1 cup (250 mL) of canned beans a day can significantly decrease the risk of cardiovascular disease (CVD) in adults with elevated low-density lipoprotein (LDL) cholesterol, which is the "bad" kind of cholesterol that collects in your blood vessels.

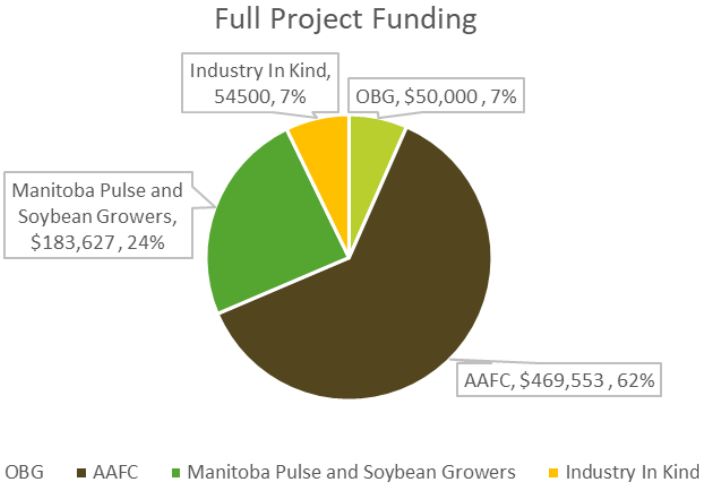
The study compared blood samples from 73 adults with high levels of LDL who ate beans in 1/2 cup (125 mL) and 1 cup (250 mL) amounts daily over a four-week period against those who ate white rice instead.

Principal investigator Dr. Alison Duncan says that eating one cup of beans per day of multiple varieties including black, navy, pinto, dark red kidney, and white kidney beans, reduced total cholesterol by 5% and LDL cholesterol by 8%.

High cholesterol is one of the leading contributors to CVD. Eating a daily cup of beans, which are nutrient dense and packed with fibre, protein, and micronutrients also lowered the risk of heart disease by 7% in adults who took part in the study. Cardiovascular diseases are one of the leading causes of death for men and women in North America, according to data from the American Heart Association and Health Canada.

"These results are significant and important because they provide high-quality scientific evidence for a feasible dietary strategy," she says. "This is good news for consumers since incorporating more beans into diets is relatively approachable. Canned beans are affordable, accessible, versatile, and practical."

This is positive news for bean growers too. Health plays a role in driving consumer trends—especially where food is concerned—and the evidence gathered in this study may lead to Health Canada approval for health claims on labels and packaging that could lead to consumer purchasing more pulses.



Total Project Funding over 3 years

$757,680

Dr. Duncan says her research and the health attributes it highlights could also positively impact domestic and export demand for Canadian bean crops. "Greater public understanding about the healthy attributes of beans may lead plant breeders to develop bean varieties that emphasize these attributes while complementing desirable agronomic traits. Farmers can use this understanding to grow bean varieties that respond to future needs and trends in bean marketing."

Future studies will look at better understanding the impact of the amount and variety of beans consumed. The results of this project also pave the way for future research into other pulses and their ability to improve human health.

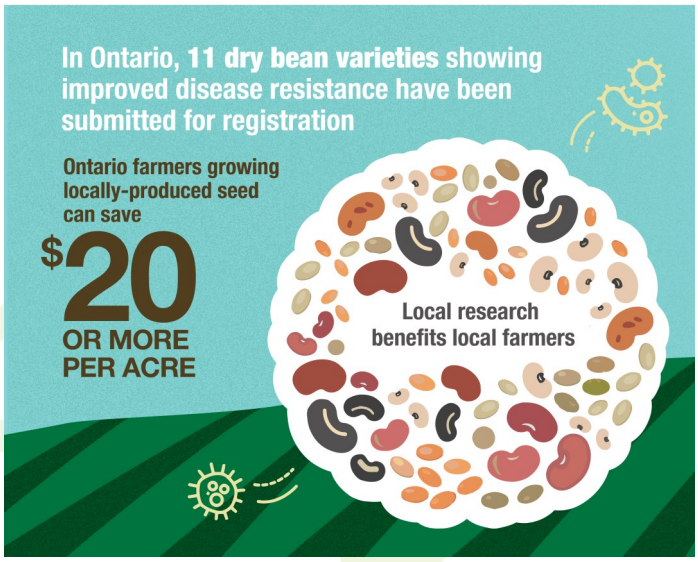
"For example, future studies could examine if different varieties of lentil decrease cancer risk due to their ability to promote a healthier gut bacterial profile, or studies could examine how pea protein could be used in food products to increase fibre and protein content and reduce heart disease risk."

Dr. Duncan says she is proud of the strong link her research establishes between agriculture and health. "Bean growers should also be proud of their role in improving the cardiovascular health of Canadians."

Pulse Science Cluster

Click here for information projects funded through the 2018-2023 Pulse Science Cluster

March 31, 2023 marks the end the Canadian Agricultural Partnership, a $3 billion five-year (2018-2023), investment by federal, provincial and territorial (FPT) governments to strengthen and grow Canada's agriculture and agri-food sector. Over the course of the past five years OBG has invested 1.35 million dollars via the Pulse Science Cluster. The leveraged funding received more than doubled OBG's investment, supporting the breeding programs at the University of Guelph (Dr. Peter Pauls) and AAFC Harrow (Dr. Jamie Larsen), canning trials at AAFC Lethbride (Dr. Parthiba Balasubramanian), the pest management program at the Huron Research station (Chris Gillard), and a pilot project on the cholesterol lowering effects of beans which we are hopeful will lead to a health claim for beans (Dr. Alison Duncan, UofG).



The current program is being replaced with the Sustainable Canadian Agricultural Partnership Program. As the title suggests, this next round of funding puts an emphasis on climate change and the environment. It has been a challenge to align the needs of our growers with the priorities set out by the government, but the Pulse Science Cluster (composed of staff from each of the provincial pulse grower groups and Pulse Canada) has worked with our researchers to ensure their projects fit under at least one of the government priority pillars.

The Pulse Science Cluster application was submitted to AAFC in early December and it is expected that we will receive notification regarding funding by the end of March 2023.

OBG has committed to investing 1.5 million dollars with specific support for the following projects:

The Interaction of Climate Change with Pest Management and Fertility in Dry Bean - Chris Gillard, Ridgetown Campus, University of Guelph

The AGGI Project: Accelerated Genetic Gain and Improvement - Dr. Valerio Hoyos-Villegas, McGill University (Dr. Jamie Larsen's breeding program at AAFC-Harrow is embedded in this project)

Bean Breeding for Increased Profitability and Environmental Sustainability - Dr. Peter Pauls, University of Gueph

Towards a better understanding of dry bean root rot and soybean cyst nematode management - Dr. Owen Wally, AAFC-Harrow

OBG has also committed to contributing $94,565 over the next 5 years to support "Agronomy and Weed Management for Organic Dry Bean Production", a project that will be conducted by Drs. Robert Nurse and Jamie Larsen at AAFC-Harrow through the Organic Science Cluster (pending government approval). The research conducted for this project will be of benefit to both organic and conventional farmers.

A One Stop Shop for Ontario Dry Bean Agronomy

The Dry Bean Agronomy website outlines agronomic management practices for dry bean production in Ontario and brings together expertise and research results from extension specialists and academic researchers. The site was developed in cooperation with and will be managed by Meghan Moran, Canola and Edible Bean Specialist, OMAFRA.

Ontario Pulse Crop Committee

The Ontario Pulse Crop Committee co-ordinates the variety registration and variety performance trials for dry beans in Ontario.

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