

healthy people 
healthy planet

Building on Success



THE CANADIAN PULSE INDUSTRY

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Building on Success

WE ARE:

- A global leader in pulse production.
- A global leader in pulse production research.
- A global leader in pulse exports.

WE WILL BE:

- A global leader in creating and capturing new markets for pulses.
- A global leader in efficient and sustainable pulse production, processing and marketing.
- A global leader in value chain innovation, creating new linkages from field to consumer, and positioning Canadian agriculture as a leading-edge supplier of agri-food solutions.



CREATING VALUE

The Canadian pulse industry and government share a common vision to build on our strengths and capture new market opportunities. This common vision of value will ensure the continued growth and prosperity of the pulse industry.

Pulses play an important role in crop production in Canada. Pulses have not only demonstrated consistent returns and led to growth in the Canadian agricultural sector; they are also good for the land. By creating their own fixed nitrogen, pulses require half the total energy inputs of other crops. This leaves a reduced environmental footprint and provides excellent agronomic returns and value to Canadian agriculture.

Pulses also create value for Canadians and a health conscious world. With excellent health and nutritional benefits and the potential to help prevent chronic diseases and other health issues, pulses are a prescription for healthy living delivered through the grocery cart. Creating more sustainable food production systems and increasing pulse consumption will strengthen the contribution that agriculture makes to the health of Canadians and the environment.

A PREFERRED SUPPLIER

Canada has become the world's dominant supplier to the global market by building a competitive edge. Excellence in the area of plant breeding and agronomy, continued work in the area of market access to expand opportunities for Canadian pulses around the world and a focus on transportation to ensure timely delivery of pulses from farm gate to end users have all contributed to building a solid industry recognized globally as a preferred supplier. To maintain and enhance this position as a world leader in the pulse trade, the pulse industry is committed to continuing to focus on these core areas to ensure that all aspects of the system work

together to build the Canadian brand. That's the Canadian pulse industry commitment.

1. The Current Situation

Canada has developed a dominant and respected position as a global leader in the production of pea, bean, lentil and chickpea crops. Since the early 1990s, the Canadian pulse industry has experienced dramatic growth. Canadian pulse production has grown from less than one million tonnes in 1991 to over 4.8 million tonnes in 2008 - a more than four-fold increase. Similarly, Canadian pulse exports have increased five-fold over the same time period to 3.5 million tonnes.

Canada is a global leader producing approximately 10% of the global pulse crop. Canada accounts for about 30% of world pea production and about 17% of world lentil production.

Canada now accounts for nearly 40% of global pulse trade. For peas and lentils, Canada accounted for 58 and 41%, respectively, of global trade in 2005 (the last year of complete FAO statistics). Canada was the fourth largest exporter of dry beans and the fifth largest exporter of chickpeas in 2005. Over 75% of Canadian pulse production is exported in a typical year.

Peas, lentils and chickpeas make up approximately 90% of Canada's pulse exports with the majority of sales to price sensitive markets where pulses form a protein and energy staple in the diet. Bean exports are roughly one-tenth of all pulse exports with three-quarters going to higher-income markets in the EU and U.S.

While Canadian pulses are shipped to more than 150 countries around the world, exports are concentrated in a small number of markets. In 2007-08, 60% of exports went to five markets - India, China, Bangladesh, the U.S. and Colombia. Over 75% of pea exports in 2007 went to five markets.

The Canadian pulse industry will build on its strengths to maintain and enhance current markets, and create new demand to grow the industry for continued success.

The Canadian industry has been successful in capturing a dominant share of pulse markets around the world. In India, the world's largest pulse market, Canada is the largest supplier, providing nearly 50% of India's total pulse import demand. In other key markets Canada supplies:

- 95% of yellow pea imports in China
- Over 95% of green lentil imports in Colombia
- 90% of green lentil imports in Morocco
- 60-65% of pea and lentil imports in Peru

Much of this success is based on Canada's competitiveness as a pulse producer. The competitiveness is fuelled by efficiencies in breeding and production technology allowing pulses to compete with other cropping options in Canada. These efficiencies also allow us to supply high quality pulses to global markets at competitive prices. Not only is Canada able to compete, it has been able to increase market share by supplying prices that drive other exporters out of the market. This successful strategy, by itself, will not guarantee continued growth in export demand at a pace that matches Canada's productive potential.

The pulse industry has established aggressive targets for yield improvements and area seeded to pulses in Canada. If the industry were to realize the yield potential of current varieties (almost double current yields) and increase the percentage of land seeded to pulses to 25% of total seeded area, Canada would produce an additional 20 million tonnes of pulses. Increased pulse consumption due to global population growth over the next 50 years would only utilize a portion of this additional production. The industry, therefore, needs to grow markets to stimulate demand, which in turn, will stimulate an increase in production. The pulse industry must look at areas of opportunity and focus on increasing demand in order to continue to achieve the growth

rates that the Canadian pulse industry has experienced over the past 20 years.

2. Evolution and Revolution

The Canadian pulse industry has been successful by moving quickly to capture market opportunities through efficiencies in the production and handling systems. Canada has emerged as a highly cost competitive exporter. And the industry will build on this success by continuing to provide competitive service to pulse markets around the world, through innovation to broaden the market base, and by continuing to explore opportunities that arise in consumer markets for food, animal feed and bio-products. The industry will prosper and grow by strengthening Canada's position in the markets of today and by creating and capturing the opportunities of tomorrow.

The pulse industry's future will be influenced by the continuous and incremental change that has shaped the Canadian industry for more than 30 years, as well as the radical and revolutionary internal and external changes that can reshape the food sector and commodity industries. The pulse industry will rise to the challenge and lead change.

The following environmental scan highlights some of the factors that are already having an impact on the pulse industry and those that will have an influence on the industry in the future.

2.1 Evolving Consumer Behaviour

- Pulse consumption is increasing at a slower rate than the rate of global population growth.
- Per capita pulse consumption has been in long-term decline in many world markets. India's per capita consumption decreased from 24kg in 1961 to 12kg per year in 2001, while China's fell from 10kg to 1kg and Spain's from 9kg to 5kg in the same period.

A world leader in the production and export of pulse crops, Canada produces approximately five million tonnes of pulses each year. Over 90 per cent of Canadian pulses are destined for the export market.

While world population is growing, traditional pulse consumption is in decline. Finding new uses and creating new demand is critical to the success of the industry in the future.

Per capita consumption in North America is about 3.5kg, holding fairly steady over the last 25 years.

- The United Nations estimated that in 2007, for the first time, the majority of the global population was urban.
- Urban population is expected to grow 1.8% a year through 2030, almost twice as fast as the global population. In 2005, urbanization in low- and middle-income countries was 44% and 18% higher than in high-income countries.
- Urbanization and rising incomes change diets and historically have contributed to reductions in per capita pulse consumption. Increased meat consumption is directly correlated to rising GDP. Processed food consumption also grows with urbanization and increased GDP.
- Urbanization is increasing the share of supermarket retail food sales at the expense of local or village markets as is seen in Asia and other developing economies.
- In India, Canada's largest pulse market, local markets continue to dominate food sales. Yet massive retail change is occurring in India with an estimated 2,000 supermarkets added in the last two years. While the share of supermarket retail food sales is 12%, annual growth is estimated at 42% with 3,200 additional supermarkets expected to be added by 2011.
- Processed food represents three-quarters of total world food sales by value. High-income countries account for a majority of processed food sales, with the U.S., EU and Japan alone accounting for more than 60%.
- Europe released more than 36% of the world's new processed food products in 2007, more than any other region, making it the most innovative and leading edge food industry in the world, followed closely by the U.S.
- Processed food products using pulses as ingredients represent only about 1% of new

launches. The majority of pulses are sold in whole form to low-income countries.

- Global population is projected to increase by 35% over the next 50 years. Over the same period, global demand for food is projected to double as urbanization proceeds, income rises, and meat consumption increases.

2.2 Human Health

- The burden of chronic disease is rapidly increasing worldwide to about 50% of global diseases. The role of diet and nutrition in the development of chronic diseases is well established.
- In developed countries, cardiovascular disease (CVD), obesity and diabetes are prevalent. Diabetes is Mexico's number one cause of death. The cost of providing care for those with diabetes in Mexico is equivalent to 34% of the country's budget for social services and doubles every five years. CVD is attributed to roughly one-third of Canadian deaths and 42% of U.S. deaths. Approximately 6% of Canadians and 7% of Americans have diabetes. About two-thirds of adults in the U.S. are overweight and almost one-third are obese.
- Developing countries are exchanging the diseases of poverty for the diseases of affluence. By 2020, developing countries will see 71% of the heart disease related deaths in the world, 70% of deaths due to stroke and 70% of deaths due to diabetes. Cardiovascular diseases are now more numerous in India and China than all the economically-developed countries in the world combined. Obesity is becoming a major problem in Asia, Latin America and some parts of Africa, despite the widespread problem of malnutrition.
- A World Health Organization report indicates that China, India and the Russian Federation could forego billions of dollars in national income over the next ten years as a result of heart disease, stroke, cancer and diabetes. The estimated accumulated

losses to China from 2005-2015, for example, are US\$558 Billion, for India US\$236 Billion, and US\$303 Billion for the Russian Federation.

2.3 Environmental Sustainability

- Arable land per capita is decreasing. In the last 12 years it has fallen from 2,100 square meters per person to 1,700 in low-income countries and from 2,300 to 2,100 square meters per person in more affluent countries.
- Agriculture's direct and indirect greenhouse gas emissions are estimated to be responsible for 17 - 32% of total greenhouse gas emissions. Indirect emissions attributed to agriculture include fertilizer production and deforestation due to pressures to increase arable land.
- The World Bank suggests that climate change will affect agriculture more than any other sector, increasing risks of crop failures and livestock losses and threatening food security.
- Food industry initiatives are proceeding in spite of the economic recession, as companies feel they will be able to maintain or increase market share by positioning key brands as 'greener'. A central strategy appears to be to make sustainability one more reason for consumers to continue to buy existing of higher-priced products.
- Demand in high-income countries is evolving to include product attributes other than price and quality. The U.S. Lifestyles of Health and Sustainability (LOHAS) sector, which consists of 35 million consumers and 16% of the American adult population, is currently valued at US\$229 billion. LOHAS consumers make purchasing decisions based on product attributes including improved health benefits and environmental benefits.
- Products marketed to the LOHAS sector are rapidly becoming mainstream. Environmentally-friendly messaging on new food products has nearly doubled

between 2007 and 2008, with the most product launches taking place in the U.S. Nearly 70% of new product launches with an environmental focus are taking place in North America and Europe.

- Varying degrees of green consumerism exist in the U.S, with the majority of the adult population (87%) having at least some knowledge of environmentally-friendly products and a willingness to make green-conscious purchases.
- Most North American food industry organizations are adopting environmentally-friendly practices. Research from the U.S. Food Marketing Institute notes that "a majority of leading consumer packaged goods manufacturers and retailers have supply-chain sustainability programs in place, but consumer-focused initiatives are in the early developmental stages."
- Leading retailers and food companies such as Coca Cola, Wal-Mart and McCain have sustainability programs, including reduced energy use, lower-impact packaging, and more sustainable ingredients, in decreasing order of prevalence. Among food products marketed as 'green', the first focus has been on reduced/recycled packaging. Industry leaders like General Mills predict the next step will be for food companies to look further back into their supply chains and focus on agriculture and raw ingredients.
- Sustainability initiatives are not just company-initiated. Government policy has begun to impact the direction taken by the food industry. Carbon footprint labeling has started in the UK. The Japanese government announced environmental food policy changes in July 2008.
- The U.S. Grocery Manufacturers' Association's (GMA) interest in sustainability led to the creation of the Keystone Initiative. In September 2008 this group released its first progress report called Field to Market: The Alliance for Sustainable Agriculture

"By 2030, grain-producing land per capita will drop to just a third of what it was in 1950, while the World Water Council predicts in just a decade we will need 17% more water than is available to feed the world."

Field to Market, the Keystone Alliance for Sustainable Agriculture.

"Increasingly we're hearing from our consumers who want to make sustainable food & fibre choices."

John Wolf, Vice President of Ingredients, Commodities and Risk management, Kellogg Company

As a feed ingredient, pulses can produce livestock end-products with a reduced carbon footprint. This type of environmental claim will be an increasing source of focus for the livestock industry.

Outcomes and counts among its members leading agribusinesses, environmental non-governmental organizations, food companies and farm groups.

- EU's Sustainable Agriculture Initiative, started by Danone, Unilever and Nestle in 2003 has grown to 50 sustainability projects by 30 of its commercial members in 20 countries. They have established 'Best Management Practices' to assist member companies in making decisions on sourcing ingredients.
- Major UK retailers, including Tesco and ASDA (Wal-Mart's UK subsidiary) are influencing food company suppliers to make preparations for carbon labeling.

2.4 Feed Industry

- Pulse use as animal feed has been highly variable and influenced by harvest weather and price differentials between food and feed. Pulses traditionally have been fed largely undifferentiated from other feed sources providing protein and energy and make their way into rations based on least-cost formulations.
- The global pet food market is a \$46 billion per year industry producing 14.3 million tonnes of dog food and 8.4 million tonnes of cat food. The 2007 pet food recall following melamine-tainted protein sources has the industry looking for safer alternatives. Pet owners are increasingly paying for attributes of health and wellness more commonly associated with the human food market.
- Aquaculture is expanding at a rate of 8% per year and depends on fishmeal as a primary source of protein. Fishmeal production is decreasing, and is increasingly associated with sustainability problems in the fisheries sector. The aquaculture industry is searching for cost-effective, digestible protein ingredients to use in diet formulations.
- The use of antibiotics in livestock rations as a growth promotant has been banned in

Europe and North America may follow suit. The possible use of pulses or pulse fractions as a prebiotic has garnered attention.

- Environmental claims related to reduced carbon footprints are expected to be an increasing source of focus for the livestock industry and may be of particular value in premium markets like Japan, the EU and in hotel and restaurant market segments.

2.5 Market Access

- Canada continues to face major risks with Canadian pulses destined for its largest market, India. India's import requirements for pulses make it costly and risky for the Canadian industry to deal with shipments that test positive for stem and bulb nematode. Diverting ships for fumigation costs exporters a minimum of \$100,000 each time a shipment tests positive and the cargo is diverted for fumigation with no certainty that diversion and fumigation will remain an option.
- While major competitors such as the US and Australia are not pursuing bilateral free-trade agreements as aggressively as in recent years, U.S. bilateral trade agreements continue to pose a threat that Canadian exporters will be disadvantaged by tariffs or other barriers not faced by their U.S. competition. The Canadian government has responded positively to these challenges by initiating action on three of four Free Trade Agreement (FTA) priority countries previously identified by the pulse industry. Deals have been signed but not yet ratified with Peru and Colombia, negotiations are underway with Dominican Republic and Morocco is being considered for an FTA.
- Food safety concerns remain high on the list of consumer and corporate interests.

2.6 Transportation

- About one-third of pulses exported from Canada are containerized; either loaded directly in the prairies or loaded from

hopper cars (or intermodal units) at port. The remainder, primarily peas, uses the bulk transport system of hopper cars and bulk vessels. Both types of movement are critical to the growth and sustainability of the pulse industry and both present significant challenges to Canadian exporters.

- There are many parties involved in the pulse transportation system, including farmers, dealers, processors, truckers, railways, stuffing facilities, shipping lines and container terminals. The individual priorities of the parties can result in behaviors that compromise the overall effectiveness of the supply chain.
- The lack of accurate demand forecasting, inadequate container and railcar allocation and supply processes, overbooking of equipment, overbooking of capacity and unreliable transit times are examples of process failures that impact pulse and special crops exports.
- Process failures lead to congestion, delays, missed vessels and split cargoes, resulting in real costs to the pulse industry that include demurrage, contract extension costs, lost sales, dead freight with shipping lines, labour costs and costs associated with maintaining cash flow when product is not flowing. These costs are largely absorbed by pulse growers, processors and exporters.
- The ever-changing business models of asset owners also present challenges to Canadian pulse shippers. The low-value, resource commodity-based nature of agri-shipments limits the capability of the traffic to absorb anything other than a 'back haul' level freight rate when moving product in containers. As a result, shipping lines do not have a great financial incentive to provide service or equipment that adds too much cost or results in equipment being shipped to an area where they cannot capture a 'head haul' movement. Shipping

lines also are not subject to any sort of common carrier obligation under the Canada Transportation Act.

- The shipper protection provisions of the Canada Transportation Act are generally not perceived by small and medium sized shippers to be viable options to address service issues that result from process failures or misaligned business models.
- From 2005-2008, four transportation related labour disruptions have impacted the pulse industry. The impact of transportation work stoppages on the pulse and special crops industry is considerable with lost earnings assessments totaling \$921,000 in the lowest cost scenario to \$38,000,000 in the highest cost scenario. The ability of any one industry to influence outcomes related to labour disruptions is limited.

3. Being Competitive and Increasing Demand

The pulse industry and government vision for agriculture highlighted in "Growing Forward" share a common goal: profitability. Profitability will be enhanced by improving production efficiencies and driving costs down. The growth of the industry must ensure that production and demand grown in unison. Therefore, to ensure the profitability of the sector there is a need to rapidly increase the demand for pulses if the sector is to continue to expand production.

Innovation and value creation are inseparable components in a strategy to build a profitable industry. The pulse industry strategy to enhance profitability will be powered by innovation that enhances competitiveness and creates new market opportunities that focus on higher values. The opportunities to create value and innovation will be identified and harnessed through strong value-chain linkages.

The pulse industry has created a transportation advisory group and is working with players throughout the transportation system to improve efficiencies and prevent future delays.



In less than 20 years, the Canadian pulse industry has experienced dramatic growth - producing less than one million tonnes of pulses in 1991 to over 4.8 million tonnes in 2008.

3.1 Increasing Industry Competitiveness through Efficiency and Expertise

The Canadian pulse industry has set aggressive targets for yield improvements and total area seeded to pulses. In order to realize these goals, the entire pulse industry will have to produce more efficiently and deliver more efficiently to customers in more than 150 countries around the world.

The Canadian industry has become a global leader in pulse production and export through major advancements in core functions like breeding and production systems and by eliminating or reducing elements that reduce competitiveness such as market access barriers and transportation costs. These core functions have been highlighted by developing and promoting a Canadian brand that encompasses the ability to deliver consistent quality from traders in a country that buyers can trust.

Canada has world class pulse research scientists and research facilities. This scientific community in partnership with pulse growers and the private sector was instrumental in developing the pulse industry from its inception in the early 1970s, to one where primary production contributed more than \$2 billion to the Canadian economy in 2008. The Canadian scientific community in both the public and private sector can be credited with the development of pea and lentil production in western Canada. Research supported the registration of pulse crop protection products and developed well-adapted varieties. Canadian farmers welcomed the new crop opportunities and the scientific community worked along

side farmers to develop new agronomic practices such as reduced summer fallow, longer crop rotations, continuous cropping, and direct seeding. Scientists have worked with producers to increase the use of pulses in rotations to optimize nitrogen fixation and break weed and disease cycles.

For continued competitiveness, the pulse industry will rely on science-driven innovation and the public-private partnership. This will be accomplished in highly variable climatic conditions, and constantly evolving disease and weed pressures. Improvements in production efficiencies will be driven by the expertise of Canadian researchers in breeding, pathology, and agronomy in partnership with pulse grower innovation.

3.2 Optimizing Market Value: Transforming Pulses from Commodities to Ingredients

As illustrated in Figure One (page 12), markets can be categorized into segments including commodities, ingredients, Canadian ingredients and proprietary ingredients. Whole pulses, split pulses, pulse flours, and pulse fractions including protein, starch and fibre could fall into any of these categories depending on supply conditions and the degree of differentiation achieved. As the pulse industry looks to ways in which it can enhance competitiveness and create and capture new demand, it will have to focus on maximizing returns from each market segment.

A commodity is defined as a product that is interchangeable; the price is subject to supply and demand of all competition. Pulses



consist of protein, energy and other essential nutrients and as a commodity Canadian pulses must compete with other sources of these components. In the feed market competitors include other pulse exporting nations, as well as products like corn, soy meal, wheat, barley and a vast array of other feed ingredients. In the human consumption markets, Canadian pulses compete with whole pulses from other origins, substitute pulses, other starch sources like corn and potato, other dietary fiber sources and other vegetable-based proteins including soybeans. In any commodity market, the wide availability of competing commodities leads to smaller profit margins and diminishes the importance of all factors other than price. Commodity markets are characterized by price elasticity where small increases in the relative price of commodities can result in large reductions in the demand for the product.

An ingredient, whether it's in the form of a whole pulse or a pulse fraction, is defined as a component or part of a formulation that is still present in the product as consumed. Pulses, as ingredients, still compete on the basis of price but with far fewer competitors. A canner of navy beans will buy beans of the appropriate quality from any supplier they can find, but navy beans will be part of the final product. Similarly, peas will always be found as an ingredient in pea soup. The price of an ingredient is dependent on the supply

and demand of that particular product and not the pricing of other ingredients. For example, flax is used in animal feeds to achieve high levels of omega-3 fatty acids. With few other plant-based sources to supply omega-3, the animal ration will always have flax, regardless of the price relationship between flax and other ingredients if the manufacturer wants an omega-3 claim on their package.

Going one step further, a 'Canadian' ingredient will further narrow the supply since the ingredient can come from only one geographic area. In the case of a Canadian ingredient, certain crops may exhibit processing characteristics, visual characteristics, attributes or production processes that are preferred by food manufacturers allowing for a product of the Canadian pulse industry to be differentiated from non-Canadian product, further limiting pressure from competing ingredients.

A proprietary ingredient is an ingredient where the intellectual capital needed to produce it is restricted. Exclusive ownership eliminates direct price competition to the benefit of the intellectual property owner. Starchlite, a white bean extract that has been clinically proven to lower caloric impact, increase digestibility and lower the glycemic impact of the foods and beverages it can be added to, is an example of a proprietary pulse based ingredient.

Positioning pulses as a value-added food and ingredient solution with health and nutritional benefits that can improve the health of Canadians has tremendous potential to grow the industry.

Figure One:
Market Segments for Pulses

*“Everyone knows
Canada is the
biggest pulse trader.
You need to focus
your efforts on
creating new demand
in areas where they
don’t eat pulses.”*

Middle Eastern buyer

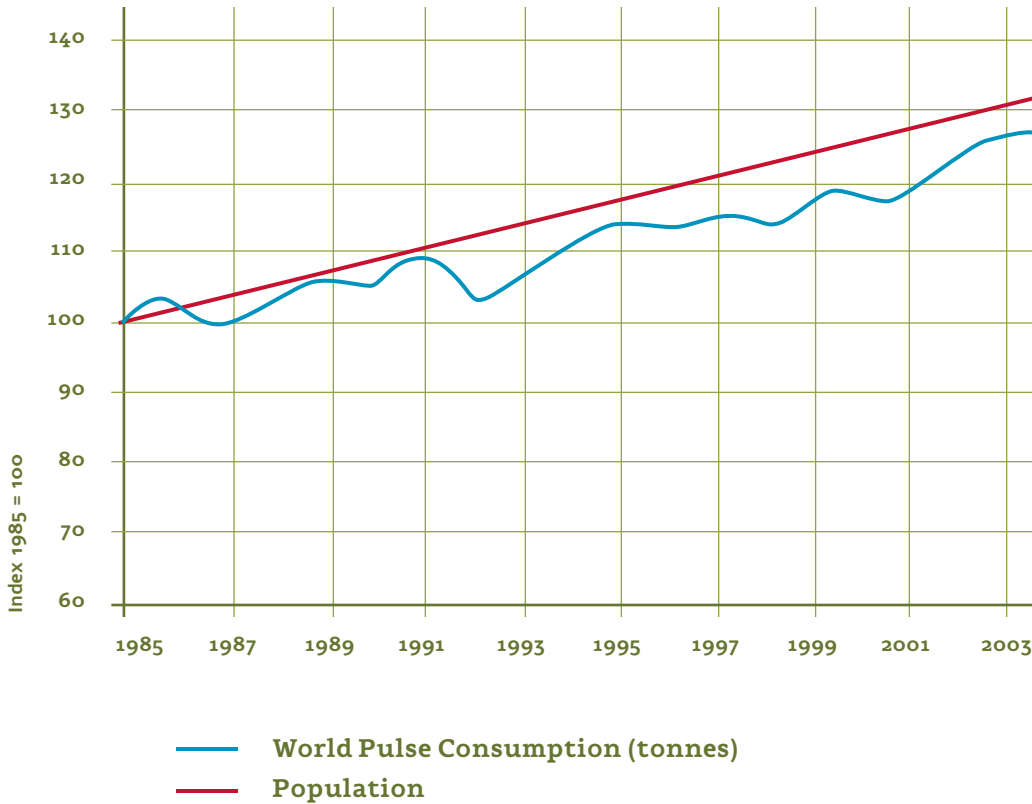
COMMODITY	INGREDIENT	CANADIAN INGREDIENT	PROPRIETARY INGREDIENT
<ul style="list-style-type: none"> • Interchangeable product • Product without qualitative differentiation • Price subject to supply and demand of all other competition (Feed peas compete with corn, soy, etc.) • Diffusion of intellectual capital necessary to acquire or produce it • Uniform quality, produced in large quantity by many suppliers • Wide availability leads to smaller profit margins and diminishes importance of factors other than price <p>Examples</p> <ul style="list-style-type: none"> • Pea starch competing with corn starch • Peas competing with soybean meal in livestock feed on the basis of digestible energy and crude protein 	<ul style="list-style-type: none"> • A component or part of a mixture or compound • A substance used in preparations of a product that is still present in the product as consumed • Building block <p>Examples:</p> <ul style="list-style-type: none"> • Peas in pea soup • Navy beans in pork'n'beans 	<ul style="list-style-type: none"> • A component or part originated from within one country <p>Example:</p> <ul style="list-style-type: none"> • Barilla pasta (with Canadian lentils) 	<ul style="list-style-type: none"> • A component with defined ownership and control held by the owner(s). <p>Example:</p> <ul style="list-style-type: none"> • Starchlite (navy bean extract)

3.3 New Demand Drivers

In order for the industry to achieve its target of increasing the percentage of land seeded to pulses to 25% of total seeded area Canada will have to be a cost-competitive and reliable supplier to current markets and create and capture new demand. Figure Two emphasizes this point by illustrating that global pulse consumption is increasing at a slightly lower rate than the rate of population increase. Canada’s growth rate in pulse trade has been much higher than the rate of increase in global pulse consumption. Going forward,

new pulse demand will complement Canada’s ability to compete on a global basis with all pulse producing and exporting nations and again ensure that Canada’s rate of pulse production and exports exceeds that seen in global trends. This growth has been achieved through a combination of competitive pricing, shifting the types of pulses consumed through competitive pricing and other Canadian crop attributes that provided consumer value. This competitive edge will be complemented by a focus on creating and capturing new demand.

Figure Two:
**Rates of Growth - Pulse Consumption,
 Population, Canadian Exports**



The demands of existing markets are well understood and to excel in them the Canadian pulse industry must create more efficiency in order to continue to drive down production and delivery costs below that of our competitors.

New demand will come from providing value to traditional and non-traditional pulse markets and shifting the focus from marketing pulses as a commodity to highlighting and promoting their uses as higher value Canadian ingredients.



Pulses not only offer tremendous health and nutritional benefits, they are grown in such a way that they are good for the environment. Combined, the health, nutrition and environmental benefits of pulses make a powerful story.

THE SWEET SPOT

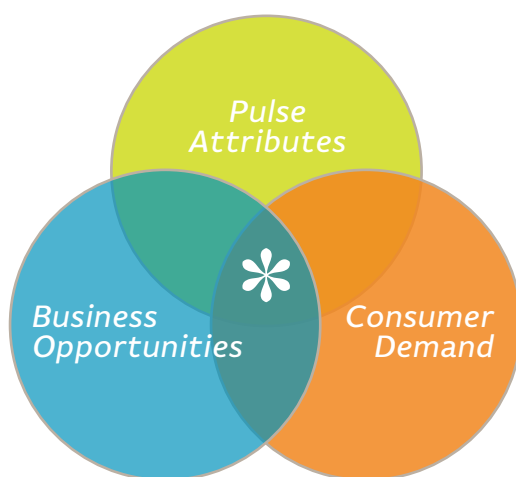
Food and feed manufacturers, consumers and governments are looking for innovative solutions to address health concerns and the growing cost of health care. There is also growing concern amongst these groups about protecting the environment for future generations. Value will be derived by addressing health and environment challenges in a way that builds on Canada's ability to preserve identity, its strict production and food safety regulatory system, and capitalizing on the value of the Canadian brand.

With attributes that deliver on what both consumers want and what corporate interests want to deliver, pulses have been described as being in the sweet spot. The "Sweet Spot" is illustrated in Figure Three. Pulses have enormous potential in disease prevention and are contributors to good health.

Pulses also play an important role in sustainable food production. Pulse crops supply their own nitrogen, using sunlight to power the conversion of this atmospheric gas into a form available to plants. This reduces the need for commercial nitrogen fertilizer

where natural gas is used to power

Figure Two:
The Sweet Spot



the conversion. The result is that pulse production lowers agriculture's greenhouse gas emissions from annual crop production. Pulses require half the total energy inputs of other crops, leaving a reduced environmental footprint for cropping systems that include pulses in the rotation.

Pulses are excellent sources of amino acids, the building blocks of protein, and energy supplied by carbohydrates. For these reasons, they are also a sought after commodity for animal diets, including livestock, pets and aquaculture. Three main areas of current use include pet food, aquaculture, and traditional livestock diets, including poultry, swine and cattle. Another future opportunity is marketing livestock products like beef, milk and eggs with an environmental sustainability message generated from the inclusion of pulses in the animal's diets. This will not only create a new market for pulses but create new markets for the livestock industries as well serving the interest in low carbon footprint food products.

To position Canada as a world leader, the pulse industry will focus on creating market demand for healthy, nutritious and environmentally-friendly pulse crops and food/feed products including whole pulses, pulse flours and pulse fractions like protein, starch, and fibre for all markets including bio-product applications. The industry will foster product innovation and market growth by developing linkages that partner agriculture with key influencers in the world of health, nutrition and environment. Success will depend on the ability of the pulse sector to foster a continuum of innovation from the seeds of science to marketing and through to consumers. In the future, agriculture's role in environmental and health care innovation can become exceedingly important and the pulse industry is in the sweet spot to deliver results in a unique, yet largely untapped way.

3.3 a. Pulses - Key Ingredients for Good Nutrition and a Prescription for Preventative Health Care

With excellent nutritional benefits, including high levels of dietary fibre and complex carbohydrates, pulses are a “super food”. They are excellent contributors to good health. Research on the health benefits of beans, peas, lentils and chickpeas and use of whole pulses and pulse flours is increasing interest in pulses as an important food ingredient. Building on the body of evidence that confirms these findings and then communicating those messages to a wide audience will be critical to grow the share of the market for pulses. This can be accomplished by partnering with researchers, the scientific community, health professionals and other key influencers to provide information and build networks along the value chain as well as work to enhance the key attributes of pulse crops through a focus at the production and genetic improvement level.

Globally, through further research and innovation to optimize the nutritional value of pulses and integration with other ingredients in food formulations, Canada can be positioned as a global leader in pulse processing and utilization. This could be especially valuable in developing nations where nutrition and nourishment and avoidance of the diseases associated with a transition to affluence are key issues that are only going to become even more critical as world population in under-developed nations continues to grow and health care costs continue to rise.

Pulses are a prescription for health delivered through the grocery cart. As a food ingredient, pulses have been shown to help prevent and combat chronic health issues. Cardiovascular disease, diabetes and obesity are all issues that are top priority for the medical community. Pulses can play an important role in fighting these health challenges. Building strong partnerships with

the medical community, health associations, researchers and funders of medical innovation will ensure that agriculture is a strong partner in health care solutions and develop broad interest in further investigation of pulses and their role in health care and disease management.

3.3 b. Pulses - Growing Environmentally Sustainable Food Production Systems

Efforts to protect Canada’s resources and the environment are valued by consumers and governments. The path to agriculture’s success and demand growth will depend on being environmentally-sustainable and responsible. As legumes, pulses have a symbiotic relationship with soil micro-organisms which enables them to make their own fertilizer from atmospheric nitrogen. As a result, pulses use less non-renewable energy inputs than other crops. Pulses have also been shown to decrease nitrous oxide emissions relative to non-legume crops in Western Canada, further reducing their greenhouse gas emissions, and some studies have indicated that they may increase levels of soil organic matter. Pulses add much-needed diversity to crop rotations, and by breaking disease and pest cycles also play an important part of an integrated pest management system.

The positive environmental attributes of pulses can be enhanced through innovation, and will create partnerships between agriculture, NGO’s and food companies focusing on corporate social responsibility.

4. New Demand for Pulses

To create and capture new demand, the pulse industry will pursue a strategy of product innovation providing value both for consumers and producers. The pulse industry will create and capture new market demand by focusing on innovation in consumer demand growth areas of health, nutrition

The results of seven clinical trials examining the link between eating pulses and good health show that pulses can help prevent chronic diseases and health issues such as diabetes, heart disease and obesity.

Pulses are among the small group of crops that use the sun’s energy to convert nitrogen in the air to a form that the plant can use. Pulses use less fossil fuel energy during production than most other annual crops.

and the environment in markets that have the potential to use pulses as food and animal feed. This section outlines the bottom line objectives of creating and capturing new market demand as well as challenges, key actions and partnerships required in order for the pulse industry to ensure the commercialization of innovation and the continued growth and prosperity of the pulse industry.

4.1 Delivering Health and Nutritional Value

BOTTOM LINE - Increased demand for Canadian pulses in existing and new markets through research and marketing efforts focused on the nutrition and health attributes of pulses.

In order to increase demand for pulses and create a new market segment for Canadian peas, beans, lentils and chickpeas, the pulse industry will develop and implement a strategy to promote the inherent health and nutritional benefits of pulses to players throughout the value chain, from growers to processors and on to end-consumers. The focus will be on markets where Canadian pulses have an inherent advantage to extract value from a wide range of attributes (identity preservation, globally recognized production and safety regulations) while taking advantage of the global appeal in health and nutritional value.

CHALLENGES

- Existing information on pulse nutrition and health attributes is not well understood by value chain members and some information is incomplete leaving potential markets undeveloped and lacking in information.
- Communication linkages between the pulse industry, medical research and medical care sectors, food industry, retailers and others have numerous gaps.

- While there is an existing body of research on pulse nutrition and health that has shown positive results related to human and animal health benefits, additional research is required to build the body of evidence linking pulse consumption with positive health outcomes such as blood sugar control, cholesterol lowering, weight management, gut health and cancer prevention to the point where the pulse industry can provide the substantial bodies of evidence required by regulators and the food industry.
- There is limited awareness and lack of technical knowledge and expertise available to the food and feed industry, including ingredient manufacturers, food processors and food service, regarding pulses and their potential to be used in recipe formulations, food product applications, menus and other applications.
- Research is limited in relation to pulse functionality and commercial applications in food/feed systems and marketing efforts to both define limitations and demonstrate solutions to commercial application issues has been very limited.
- Find out if there are 'equipment' gaps as it may be something that needs to appear in this section.

ACTIONS AND PARTNERSHIPS

- Deliver strategic communication and marketing strategy to raise the profile of existing knowledge on the contribution of pulses to health and nutrition among priority players in the food and feed industries, health organizations, health professionals and consumers.
- Develop science based health messaging directed to priority value chain members in the food and feed industries, as well as with targeted consumer gatekeepers and organizations in direct contact with consumers.
- Equip targeted health organizations and health professionals with tools (e.g.

Chronic diseases, such as diabetes, heart disease and obesity are on the rise. Finding food solutions to health concerns plaguing people around the world presents an opportunity for pulse growers.

information and materials) to communicate pulse nutrition and health benefits to consumers.

- Increase the body of evidence on pulse nutrition and health, as well as the science around pulse functionality and applications in food and product formulations.
 - Work with key stakeholders including medical researchers, retail and consumer sectors, manufacturers and academia to identify research gaps in nutrition, health and food/feed science that will help address barriers to consumption and promote pulse use in commercial applications.
 - Act as catalyst to link interested parties and communicate commercialization priorities to funders and value chain members including food/feed manufacturers, and health organizations. These partners will help guide and fund collaborative research endeavors, leveraging pulse industry resources.
- Identify leaders and develop partnerships with priority food and feed industry companies, including ingredient manufacturers, food and feed processors, food service, retailers. Work with partners to initiate collaborative research, product development, and marketing efforts leading to promotion and greater inclusion of pulses as ingredients in a range of products showing the greatest potential for commercialization.
- Increase capacity of Canadian pulse producers, traders and processors to promote and market pulses based on their nutritional, health, functional attributes.
- Investigate and pursue health claims and other health messaging by working within the food and health regulatory environment in Canada and export markets.
- Create a 'knowledge centre', a 'go to' centre of excellence in Canada.

4.2 Providing Environmental Value

BOTTOM LINE - Generate new demand for pulses based on their environmental contribution to sustainable food production systems.

Environmentally sustainable food production systems, with ingredients sourced from reputable sources is emerging as a global demand driver. As with the health and nutrition messages, the pulse industry has a story to tell about the environmental value that pulses offer and has a great deal to learn about how best to serve this emerging market demand. Pulses play an important role in creating a sustainable production system, but the focus to date has been on communication with the production side of the industry with few links to the demand side of the industry. By reflecting market interests and the market perspective of environmental sustainability, the pulse industry will research, develop and promote the environmental benefits of growing and using Canadian pulse crops to create new market opportunities and grow demand for pulses and pulse products.

CHALLENGES

- There are significant gaps in the pulse industry's understanding of the environmental sustainability priorities of value chain partners.
- Limited collaboration with down-stream value chain partners
- Inadequate knowledge of the emerging regulatory environment related to sustainability claims, regulations and programming.
- Limited efforts to engage with non-governmental organizations (NGOs) regarding environmentally sustainable food, particularly those NGOs with significant influence with government and the food industry.
- Little experience in marketing agriculture's environmental record with messages

"...little change will occur unless we move beyond our system boundaries and support strong environmental improvement efforts in the agricultural sector."

Gene Kahn, General Mills



that resonate most with the retail sector, manufacturers, consumers and influencers.

- Lack of understanding on how to maximize pulse grower value from the emerging field of carbon trading
- Uncertainty surrounding the development of carbon trade protocols that could increase incentives for use of pulses in food and feed applications.
- Insufficient knowledge on the effects of feeding pulses at different inclusion rates on emissions from livestock.

ACTIONS/PARTNERSHIPS

- Engage with food and feed industry stakeholders to become a solution provider vis-à-vis their sustainability priorities.
- Develop research and other programming to address demand-side requirements based on better understanding of sustainability priorities of value chain partners.
- Develop communications and collaboration programming that capitalizes on existing and emerging world-class, Canadian scientific research.
- Quantify and establish the credibility of pulse crops' environmental performance.
- Communicate the pulse environment story to engage consumers, retailers, food companies, ingredients companies, NGOs and many others.
- Build linkages with regulators in order to understand requirements related to sustainability regulation and programming.
- Build linkages with NGOs and understand their needs regarding environmental sustainability of food, leading to NGO endorsement and higher credibility of pulse sustainability messages.
- Participate in pilot projects with NGOs and food companies to build closer linkages between the food industry and producers, leading to product differentiation opportunities and higher value at the farm gate.

"Process improvement means finding, isolating, and reworking defects in the process. Process improvement demands that we overcome our own inertia. We can't be content to do things the way they've always been done."

*E. Hunter Harrison,
President and CEO, CN Rail*

5. Being Competitive with Globally-Recognized Expertise

The Canadian pulse industry has grown from a fledgling producer and exporter to become the world's dominant supplier to the global market. This success has been based on building a competitive edge. Success in the area of plant breeding and agronomy has resulted in production expertise. Marketing expertise has expanded the export of Canadian pulses to more than 150 countries. Continued work in the area of market access to ensure continued competitiveness for Canadian pulses in countries around the world and a focus on transportation to ensure timely delivery of pulses from farm gate to end users have all contributed to building a solid industry recognized globally as a preferred supplier.

Continuous improvement in these core functions - marketing, transportation, market access and breeding and agronomy programs - is an essential part of ensuring that the industry continues to out-perform its rivals. The pulse industry will always have to build on the core functions to enhance value for both the production and utilization sides of the industry.

The pulse industry will solidify its competitive edge by focusing on five core functions:

5.1 Improving reliability of transportation

5.2 Access to markets by eliminating barriers and minimizing risks

5.3 Efficient Production System

5.4 Pulse breeding programs: Delivering key output traits

5.5 Delivering 'Canada Brand' Pulses

5.1 Improving Reliability of Transportation

BOTTOM LINE - Shippers must have timely access to equipment (including hopper cars, boxcars, intermodal units and marine containers) and receive consistent and reliable service from transportation service providers.

Transporting pulses from a wide production area to more than 150 countries around the world is a challenging and complex process. An effective and efficient transportation system is needed to grow the pulse industry and ensure a sustainable future. There are many players involved in the transportation system and efficiencies need to be created to ensure a smooth process and a consistent reliable supply of Canadian pulses to buyers in the global market.

CHALLENGES

In order to build an efficient and effective transportation system, there are a number of gaps that must be filled to create conditions that will result in asset owners providing better access to equipment and improved levels of service. To achieve this, the pulse industry requires the following:

- Information regarding the mode in which pulses and special crops move from origin to destination and the seasonality associated with those movements.
- Accurate data that captures the performance of the transportation system tasked with moving product from the field to customers.
- Consensus on the infrastructure needs of the industry acknowledging the wide range of products produced and business models employed across the country.
- Information on options available to shippers who are receiving inadequate levels of service from transportation service providers.

- Regulations and legislation that offer protection to shippers who have little power in their relationships with large carriers.
- Forums that promote communication and collaboration between all the stakeholders in the supply chain.

ACTIONS/PARTNERSHIPS

To ensure continued success, several actions are needed. It is also important to recognize that the industry must partner with other supply chain stakeholders to ensure that system-wide improvements are achievable. By developing partnerships, the industry will bring all decision makers together in order to encourage communication and collaboration that will result in process improvements, smart investments and better policies.

- Secure partners from within the shipping community, freight forwarders, transloaders, railways, shipping lines and government that can help the industry achieve its objectives.
- Work with those partners to identify at a micro level the information gaps that must be filled, the order in which they need to be filled and the action plan that will follow, focusing on pulling stakeholders together and delivering a persuasive communication plan.
- Gather information in the areas of movement of pulses and special crops, performance measurement of the system, assessment and evaluation of infrastructure needs and dispute resolution options for shippers.
- Actively seek commercial solutions to challenges by bringing together those with a stake in handling and transporting pulses and special crops.
- Advocate and communicate on behalf of the industry when challenges aren't being adequately addressed through collaboration with supply chain stakeholders.

"Predictability is central to the overall costs that companies incur in logistics and thus to their competitiveness in global supply chains".

World Bank, 'Connecting to Compete, Trade Logistics in the Global Economy' 2007



- Continuously search for knowledge and structural gaps that must be filled, engage new partners and strive to find solutions through collaboration and strategic communication.

5.2 Access to Markets by Eliminating Barriers and Minimizing Risks

BOTTOM LINE - Elimination of barriers to trade and ensuring that no new barriers are introduced.

Market access priorities constantly evolve. As access goals are achieved, new opportunities and challenges develop. Part of the success of the pulse industry has been in removing barriers to trade and ensuring open access in markets around the world for Canadian pulses. Improving access and opening up access to new markets will continue to be a priority for the pulse industry.

CHALLENGES

To ensure continued access to existing markets and open opportunities in new markets, a number of challenges must be addressed. Challenges to be addressed include:

- A need for improved and ongoing knowledge of the sources of current and potential access barriers.
- A need for improved understanding of barriers to trade in processed pulse products.
- The existence of tariff and non-tariff barriers and other regulations governing trade and the use of pulses and processed pulse products in targeted markets.

ACTIONS AND PARTNERSHIPS

- Identify market access priorities by partnering with pulse exporters, processors, ingredient suppliers and grower groups.

- Identify preferred solutions to market access problems by partnering with, Canadian government officials, foreign governments, importers, other Canadian industry players as well as elected officials.
- Provide input, feedback and updates to key stakeholders to report on progress and re-assess needed actions.
- Monitor changing global regulations impacting international trade in pulses and pulse products and work with other sectors to ensure regulations do not unfairly restrict trade in pulse and pulse products.

5.3 Efficient Production System

BOTTOM LINE - Canadian pulse production that reflects the needs of an evolving market that is competitive within Canadian cropping systems and with other pulse-producing nations.

The success of the Canadian pulse industry stems from investments in research and technological improvements that assist in production and management of pulse crops. A strategy for a profitable and sustainable pulse sector must ensure that pulse yields continue to advance the profitability of the sector.

Eco-systems are dynamic and crop production must constantly develop and adopt new technology and scientific innovation that is 'production positive' and limit the impact of 'production negative' influences like changes in heat or moisture and pressures such as evolving weed, disease and insect pressures. Profitability in the sector will also require a complete understanding of how genetic and environmental variables can be employed to improve nutritional, health and environmental quality attributes as defined by the market. Technology, science and innovation will drive production forward as the first element of industry profitability.

"Spurring innovation - especially focused on developing high-value-added products that appeal to international markets - is the surest way for Canada to renew its global economic competitiveness."

*"Breaking away from the pack: Enhancing Canada's global competitiveness"
McKinsey & Co. Canada.*

CHALLENGES

In order to ensure continued access to existing markets and open opportunities in new markets, a number of challenges must be addressed.

- Genetic shifts in weed, disease and insect pests making control a moving target.
- Concerns about plant, environmental and food safety impact pulse trade.
- Current production practices do not optimize pulse crop nitrogen fixation.
- Climate change may put pressure on western Canadian producers while, at the same time, society is demanding that food be produced in an increasingly sustainable manner.
- The industry can not effectively measure the amount of nitrogen fixed by pulse crops and the amount of nitrogen available for the subsequent crop.

ACTIONS AND PARTNERSHIPS

To address the challenges of having competitive pulse crop production systems that will deliver environmental value within a cropping system, several actions are needed.

These include:

- Develop tools for crop production that meet trade requirements by leveraging international regulatory connections, life science companies, etc.
- Search for biological and reduced risk chemical controls to ensure environmental safety standards remain as the highest in the world and reduce costs.
- Deliver information and improve performance as measured by demand side metrics of sustainability.
- Optimize nitrogen fixation by improving pest control, curtailing the use of pesticides that limit nitrogen fixation, increase reduced tillage practices, optimize

pulse based cropping sequences, improve soil fertility (while maintaining low available soil nitrogen levels), optimize fertilizer applications.

- Reduce producer input costs while enhancing soil quality, improving water use efficiency and reducing the use of crop protection products and minimizing energy requirements.

5.4 Pulse Breeding Programs: Delivering Key Output Traits

BOTTOM LINE - Genetic resources to optimize farm revenue from pulse and pulse products with unique, marketable attributes (environmental, health, nutrition).

The goal of pulse breeding programs is to use genetic improvement to develop innovative solutions to reduce the cost of pulse production and provide buyers with innovative and unique pulses and pulse products that cannot be substituted by other ingredients. Pulse breeding in Canada reflects a unique mix of public and private investments reflecting the need to provide public value through public investments.

CHALLENGES

Various knowledge gaps need to be filled to breed and produce pulses that can compete with other crops, and other exporters, and meet the attributes demanded by consumers. These challenges include:

- Constant pressure for higher-yielding, disease resistant, environmental stress resistant varieties with traits defined by the market.
- Lack of scientific tools to increase the rate of genetic improvement as pulse crops are minor in importance when measured by the area seeded to corn, soybean, rice and wheat.
- Only basic understandings of the impact of agronomic practices on end-use traits that

The industry's "reduced risk" strategy puts Pulse Canada on a quest to continuously search for new approaches to further lower risks and the use of crop protection products. For example, insect and disease monitoring programs allow the sector to foster development of genetic and biological controls that forego unnecessary use of chemicals.



will have market value (health, nutrition, functionality).

- Opportunities arise to provide new ingredient solutions as consumer markets evolve.

ACTIONS AND PARTNERSHIPS

- Develop new pulse varieties, and new pulse species adapted to Canadian growing conditions, that are demanded by consumers for their health, nutrition, and environmental attributes, and demanded by producers for their agronomic traits and profitability.
- Develop and extend standardized production practices (fertility, pest management, water management, crop rotations, and harvest methods) that result in consistent Canadian pulse production that improves profitability and competitiveness.
- Quantify the impact of pulse crop production on soil, water, air, and biodiversity quality with the goal of obtaining information that can be used to market the environmental attributes of Canadian pulse based cropping systems.
- Extend a comprehensive version of the breeding and production knowledge to producers, processors and consumers.

5.5 Delivering ‘Canada Brand’ Pulses

BOTTOM LINE - Maintain and enhance Canada’s competitive position by leveraging existing strengths of Canadian pulses, the industry and Canada more generally to create a preference for and loyalty to Canadian pulses.

Canada has an established reputation as a world leader in the production and export of pulse crops. Maintaining and enhancing that reputation is an ongoing challenge. The Canadian pulse industry needs to continually promote itself as a leader in the industry to

customers around the world. Communicating with existing and potential customers is an ongoing need and pursuing opportunities to promote the Canadian brand is a key focus for the industry.

CHALLENGES

- Maintaining a close relationship with all buyers and all markets when exporting to over 150 countries.
- Broad and widely varying definitions of quality attributes and values given to various quality attributes.
- Maintaining and enhancing Canada’s image and reputation as a supplier of high quality products, responsive to buyers’ needs and ensuring that buyers are aware of the latest developments.
- Insufficient demand driven investments at the production level of the industry that meet end-user requirements.

ACTIONS AND PARTNERSHIPS

- Develop and maintain information systems to facilitate cost-effective global communication and marketing approaches for pulse buyers.
- Create and enhance business relationships with potential new and existing pulse buyers.
- Build and strengthen linkages between value-chain members representing pulse production and pulse utilization segments.
- Explore and implement programs to strengthen the Canadian brand and the pulse brand in export markets through collaboration with priority partners.

The Canadian pulse industry is as diverse as the provinces and climates in which pulse crops are grown. Provincial pulse grower organizations in Alberta, Saskatchewan, Manitoba and Ontario have established unique priorities to meet the needs of farmers they represent. The priorities of the pulse trade reflect the diversity of businesses that process and trade Canadian pulses, ranging from small, locally-owned operations to the world's leading grain trading companies. Canada's pulse industry strategy reflects the diversity of each of its members' strategies, building on the strength of a shared vision for the development of a sustainable and profitable sector.

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