

Canada-BC Agri-Innovation Program – Project Listing by Category

Choose a category from the list below to check out ongoing and completed Agri-Innovation projects funded by the Canada-BC Agri-Innovation Program.

Animals	Food and Beverage Processing	Information Systems	Knowledge Transfer
Pest Management	Plants	Technology	Waste to Resource

For further information on ongoing projects please contact the program administrator, [B.C. Investment Agriculture Foundation \(IAF\)](#) directly by email (funding@iafbc.ca) or phone (250-356-1662).

Funding for this program is provided by [Growing Forward 2](#), a federal-provincial-territorial initiative.

Animals

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
Cattle - Direct Visual Embryo Retrieval and Exchange (DVERE) / INN126	<p>Objective: The livestock industry wants to improve productivity through improved genetic selection. Embryo capture and transfer is one way to improve animal genetics, but is costly and complex. This project aimed to reduce costs by developing a specialized embryo transfer tool for commercial cattle and horse operations and other agricultural applications.</p> <p>Result: The equine prototype exceeded expectations and the results from the bovine prototype were satisfactory. Both prototypes require some fine tuning in order to move to a pre-manufacturing phase.</p> <p>Impact: To be determined</p> <p>For further information contact: Dr. Quinn Gavaga at the Cache Creek Veterinary Hospital</p>	<p>\$380,000</p> <p><i>complete</i></p>
Bees – Purified lysozyme feed additive for honey bees / INN090	<p>Objective: Bees are critical for crop pollination and honey production. This large-scale pilot study tested the benefits of feeding bee colonies with an innovative new lysozyme food additive product. Lysozyme is an enzyme</p>	<p>\$167,170</p> <p><i>complete</i></p>

	<p>extracted from hen egg whites that has been shown to strengthen the general health of bee colonies, decrease colony losses and prevent honey bee disease.</p> <p>Result: The application of Apiforte in the spring controlled disease occurrence and increased honey yield for some farms. When applied in the fall, it helped the survival of the bees during the winter. In general, the expectation that Apiforte will restore hive health and thereby increase output and survival has been confirmed.</p> <p>Impact: To be determined</p> <p>For further information contact: Yuncai Gao at Neova Technologies Inc.</p>	
<p>Dairy – Reproduction traits and different management approaches / INN138</p>	<p>Objective: The dairy industry is trying to improve productivity by increasing pregnancy rates among cattle. This study looks at the relationship between stocking density and the reproductive behavior of cows.</p> <p>Result: Two estrus detection systems were compared. Both systems had high precision of estrus detection and showed good agreement between measurements of estrus expression. The relationships between physiological traits and measurements of estrus expression were not consistent between systems and should be further analyzed.</p> <p>Impact: To be determined</p> <p>For further information contact: Dr. Ronaldo Cerri at the University of British Columbia</p>	<p>\$10,000</p> <p><i>complete</i></p>
<p>Water buffalo – artificial insemination, herd genetics and milk production / INN130</p>	<p>Objective: The genetics of the Canadian water buffalo herd are poor when compared to other countries. The importation of animals and embryos is limited due to disease transmission and health concerns. This project will develop an AI protocol for the BC water buffalo herd.</p> <p>Result: Participants went from almost 0 success to limited success and are encouraged enough to continue with their AI programs</p> <p>Impact: To be determined</p>	<p>\$5,000</p> <p><i>complete</i></p>

	<p>For further information contact: Gerry McClintock at McClintock Farm</p>	
<p>Cattle - Bovine Respiratory Disease Complex – Non-antibiotic and anti-microbial product (Bovinex) / INN074</p>	<p>Objective: Bovine respiratory disease (BRD) reduces the productivity of cattle and is predominantly managed using antibiotics. This project studied the effectiveness of a non-antibiotic nasal spray product (BOVINEX™) for controlling BRD in feedlot cattle. If successfully commercialized, the product could benefit both the natural and organic beef industries.</p> <p>Result: Results of this study showed that BOVINEX™ was as effective as traditional antibiotic treatments for controlling BRD and did not interrupt scale efficiencies at a commercial feedlot. It also provided sufficient evidence to Health Canada, Veterinary Drug Directorate and Canada Food Inspection Agency (VDD/CFIA) to allow the completion of a larger randomized commercial feedlot trial and to sell cattle treated with BOVINEXTM for food.</p> <p>Impact: The product is now being commercialized by major pharmaceutical.</p> <p><i>For further information contact: Trent Smith at Bovicor Pharmatech Inc.</i></p>	<p>\$207,000</p> <p>complete</p>
<p>Broiler Chicken – Investigating benefits of supplementing broiler chicken pellets with poultry litter biochar / INN105</p>	<p>Objective: Consumption of biochar by broiler chickens has been shown to improve feed conversion and weight gain. This project aimed to determine whether supplementing feed with biochar made from BC poultry litter has the same impact, with the secondary benefit of creating a new poultry litter disposal option for BC producers.</p> <p>Result: Supplementing broiler feed with poultry litter biochar did not increase weight gain or improve feed conversion ratios in the study population.</p> <p>Impact: To be determined</p> <p><i>For more information, please see the project Fact Sheet.</i></p>	<p>\$34,500</p> <p>complete</p>

<p>Cattle – Demonstration of Aerial Infrared Thermography / INN112</p>	<p>Objective: To pilot and assesses the effectiveness of using Unmanned Aerial Vehicles (UAV) for locating cattle on Crown range and for detecting sick cattle in a feedlot using Infrared Thermography technology.</p> <p>Result: The study successfully demonstrated:</p> <ol style="list-style-type: none"> 1) Cattle could be found under a forest canopy at night using a UAV equipped with an infrared thermal camera 2) Metabolic activity can be captured using a thermally equipped UAV., 3) Radiometric imagery has excellent diagnostic potential for early disease detection in feedlot cattle. <p>Impact: The applicant received additional funding from the federal government to expand research into the use of unmanned aerial vehicles in the ranching industry. <i>For more information, please contact Dr. John Church, Associate Professor at Thompson Rivers University.</i></p>	<p>\$112,200 complete</p>
<p>Cattle/Dairy - Determination of Vitamin K2 levels in Canadian Dairy and Beef / INN113</p>	<p>Objective: High levels of vitamin K2 are beneficial to human health, and are found in large quantities in regular-fat dairy products. This project will study current vitamin K2 levels, and provide recommendations for strategies to maximize K2 levels in both dairy and beef products.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined</p> <p><u>For more information, please contact Dr. John Church, Associate Professor at Thompson Rivers University.</u></p>	<p>\$38,000 complete</p>
<p>Dairy - Welfare of Dairy cows in Automated Milking Systems / INN174</p>	<p>This study aims to optimize the use of automated milking systems (AMS) by dairy farmers. Housing and management practices that are most strongly linked to animal welfare and performance will be identified, and recommendations for updating the Dairy Code of Practice to accommodate AMS will be developed.</p>	<p>\$67,000 ongoing</p>
<p>Aqua Cow Rise System Project/ INN195</p>	<p>Objective: Care and handling of downer cows has been a challenge for the producers and veterinarians and is considered a major welfare issue in the dairy industry. An important first step in the treatment of a downer cow is to help her stand. This project will test the efficacy of the Aqua Cow Rise System (ACRS) equipment at helping downer cows regain the ability to stand. Result: The Aqua Cow Rise System can be used to help a</p>	<p>\$21,450 complete</p>

	<p>recumbent cow stand and the chances of recovery are much higher if treatment begins within 24 h, and recovery is unlikely if treatment began after more than 48 h.</p> <p>Impact: To be determined.</p> <p><i>For more information, please contact Lisa MCrean from AgWest Veterinary Group Ltd.</i></p>	
<p>Development of a Point-of-Care PCR diagnostic platform and assays for the poultry industry/ INN226</p>	<p>Objective: This project will adapt the Accutas hydrogel PCR system to allow producers to economically test for poultry borne pathogens at the barn before sending the results to a consulting veterinarian to develop a plan of action. The test is very easy to run and the equipment a fraction of the cost of laboratory PCR machines.</p> <p><i>For more information, please contact David Alton or visit the James Group Ventures website</i></p>	<p>\$181,5000</p> <p>on-going</p>
<p>Effects of Pre-pubertal Growth Rate on Puberty and Estrus Behaviour of Holstein Heifer/ INN139 SP</p>	<p>Objective: This project will do a detailed study of estrous behaviors in dairy cows using video recording and automated monitors to provide a more accurate description of the factors affecting estrus expression in Canadian herds.</p> <p><i>For more information, please contact Dr. Ronaldo Cerri from UBC</i></p>	<p>\$10,000</p> <p>complete</p>
<p>BCBHEC Hatch and Production Hatch Monitoring Program/ INN203</p>	<p>Objective: This project will develop a electronic reporting system for the broiler hatching egg industry to provide more timely data entry and analysis in an effort to increase sector productivity. Results: The program has been developed and is available to the sector.</p> <p>For more information, please contact Veronica Kushnerenko from BC Broiler Hatching Egg Commission</p>	<p>\$30,000</p> <p>complete</p>
<p>Effect of Diatomaceous Earth on Feed Conversion, Efficiency, Growth and Manure Composition in</p>	<p>Objective: This project will determine whether adding Red Lake Diatomaceous Earth to commercial broiler feed improves body weight and feed conversion in broilers.</p>	<p>\$6,856</p> <p>complete</p>

<p>Commercial Broilers/ <i>INN269SP</i></p>	<p>Results: While the results of the study were not as positive as anticipated, the Red Diatomaceous Earth may provide some value.</p> <p>Impact: To be determined.</p> <p><i>For more information, please contact Jen Bylycia from Absorbent Products Ltd.</i></p>	
<p>Avian Influenza Field Use PCR System Aquila Veterinary Diagnostics/ <i>INN299</i></p>	<p>Objective: Over 9000 sediment samples from wetlands across the lower BC mainland will be tested using a field based hydrogel qPCR system and compared to the reference lab PCR system.</p> <p>Results: To be determined</p> <p><i>For more information, please contact David Alton or visit Aquila Veterinary Diagnostics Ltd. website</i></p>	<p>\$51,945</p> <p>on-going</p>
<p>Validation of CLOV in Poultry Hatcheries and Processing Facilities/ <i>INN319</i></p>	<p>Objective: This project will demonstrate the effectiveness of Cedar Leaf Oil Vapor (CLOV), as a safe, green, and acceptable broad spectrum antimicrobial agent, for the decontamination of poultry building.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Brent Matich from Cedar Biotech Inc.</i></p>	<p>\$253,238</p> <p>on-going</p>

Food and Beverage Processing

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
<p>Fruits and vegetables – stabilized, dried and value added / INN108</p>	<p>Objective: North of 49 Naturals sought to commercialize a custom dehydration technology able to process small volumes of process-grade fruit and vegetables; products previously being discarded or used only for low-value feed. Funding was used to scale up the processing facility, complete scientific analysis to optimize processing success for various raw materials, and improve vegetable blanching methods.</p> <p>Result: The system has successfully been scaled up and has proven capable of processing flexible volumes of</p>	<p>\$170,000</p> <p>complete</p>

	<p>fruit and vegetable product at an economically viable price point.</p> <p>Impact: As of early 2015, the applicant is processing about 30 mega tonnes (Mt) of previously discarded fruit and vegetables per month, producing 3Mt of dried product destined for use in niche markets across Canada (e.g., bars, dry blends, mixes). The company aims to increase production to 5Mt of dried product/month by the end of 2015.</p> <p><i>For more information, please visit the North of 49 Naturals website</i></p>	
<p>Fruit and veg – Closed loop ambient dryer / INN111</p>	<p>Objective: Rich Naturals Inc. sought to design a labor and energy-efficient, mobile system for drying small volumes of fruits and vegetables. The technology is designed for on-farm use by small growers and greenhouse operators.</p> <p>Result: The system design was completed and the applicant is looking to patent and commercialize the system design. The applicant received additional funding (INN249) to build a prototype for commercialization.</p> <p>Impact: To be determined</p> <p><i>For more information, please visit the Rich Naturals website</i></p>	<p>\$84,000</p> <p>complete</p>
<p>Dairy – Commercialization of Innovative Products, Technologies and Practices for SME Cheese Processors / INN098</p>	<p>Objective: To introduce new-to-BC technologies and processes for the manufacture of artisan cheese products.</p> <p>Result: Four new raw-milk cheese products were developed and are commercially available in the Okanagan/Shuswap region</p> <p>Impact: Employed 2-3 full time employees and 3-4 part-time employees</p> <p><i>Please visit the Terroir Cheese Ltd. website for more information:</i></p>	<p>\$250,000</p> <p>complete</p>
<p>Innovation in Cultured Dairy Processing to Increase BC Dairy Consumption / INN092</p>	<p>Objective: To use ultrafiltration technology to develop a unique Greek yogurt using 100% BC milk.</p> <p>Result: Several new yogurt products were successfully developed, and are now available at a number of large-scale grocery chains and independent stores in BC.</p>	<p>\$171,850</p> <p>complete</p>

	<p>Impact: As of May 2016, Tree Island supplies yogurt to farmers markets, restaurants and more than 125 grocers, including more than two dozen Thrifty Foods locations in BC.</p> <p><i>For more product information, please visit the Tree Island Yogurt website</i></p>	
<p>Apples – Transforming the Okanagan Apple sector through hard cider & blends / INN080</p>	<p>Objective: The BX Press sought to develop five innovative cider beverages - a dry apple cider, a medium-sweet apple cider, a berry blend cider, a cherry blend cider, and a hopped cider – using local BC products (apples, honey, hops, cherries and berries).</p> <p>Result: Four new blended full-juice craft ciders were successfully developed, and targeted for commercial sales in April 2015.</p> <p>Impact: A 3 fold increase in sales has encouraged BX Press (and other entrepreneurs) to continue to innovate with new blended cider varieties. Their successful use of BC primary ingredients such as hops or berries greatly expands the varieties of apples that can be considered for cider and will increase the opportunity for local growers and the local packinghouse.</p> <p><i>Please visit the BX Press website for more information</i></p>	<p>\$46,451</p> <p>complete</p>
<p>Develop the technology to produce a pre-biotic from milk permeate /INN102</p>	<p>Objective: Building on previous work funded under GF innovation programs, Vitalus Inc. sought to develop a process to use the by-products of their milk ultrafiltration process to produce a new, high-value food product for use in supplements and infant formulas.</p> <p>Result: The project was able to successful.</p> <p>Impact: In the fall of 2016, Vitalus received \$10 million from the federal AgriInnovation Program and another \$3.5 million from Western Innovation (WINN) Initiative to commercialize the product, including a plant expansion in Abbotsford. Soon after, Vitalus announced a joint venture with Gay Lea Foods to create a second plant in Winnipeg. <i>For further information, please visit the Vitalus website</i></p>	<p>\$94,100</p> <p>complete</p>
<p>Design a Process to Produce Galactooligosaccharides from Milk Permeate / INN188</p>	<p>Objective: Vitalus Inc. is pursuing the production of galactooligosaccharides (GOS), a value-added product from milk permeate - the by-product of dairy milk ultrafiltration. Building on work done in INN102, this next stage of the project aimed to design the process,</p>	<p>\$28,500</p> <p>complete</p>

	<p>surge plan, and layout for GOS production.</p> <p>Result: Layout design for integration of new technology with the current MPC process was completed, as was the process for GOS production.</p> <p>Impact: <u>In the fall of 2016, Vitalus received \$10 million from the federal AgriInnovation Program and another \$3.5 million from Western Innovation (WINN) Initiative to commercialize the product, including a plant expansion in Abbotsford. Soon after, Vitalus announced a joint venture with Gay Lea Foods to create a second plant in Winnipeg. .</u></p> <p><i>For further information, please visit the Vitalus website</i></p>	
<p>Pilot project for the development of ketone substrate edible oils / INN124</p>	<p>Objective: To develop and commercialize a new edible Camelina-based oil product.</p> <p>Result: Three new Camelina-based oil products were successfully developed and commercialized.</p> <p>Impact: To be determined.</p> <p><i>Please visit the Alpha Health Products website for more information</i></p>	<p>\$110,253</p> <p>complete</p>
<p>Reducing the amount of volatile acidity in wine / INN089</p>	<p>Objective: Acidity can negatively impact the quality of wines, particularly ice wines. One gene appears to be responsible for much of this acidity. The study sought to identify the responsible gene so that it can be mutated to create a yeast strain that produces lower amounts of acidity in wine.</p> <p>Result: The study was not successful in identifying the pathways responsible for acetic acid production during wine making. Further research is required. <i>For more information, please contact the Wine Research Center at the University of British Columbia</i></p>	<p>\$103,295</p> <p>complete</p>
<p>New Craft Spirits from 100% BC Agricultural Products and their Consumer Viability / INN079</p>	<p>Objective: To develop and commercialize a number of new products made from under-utilized BC agricultural products. A variety of these products will be used to build new world class spirits and expand the market for them focusing on historical craft distilling methods.</p> <p>Result: Promising results (taste and alcohol content) were achieved using locally produced, organic Jerusalem Artichoke and Sugar Beets to produce a rum product.</p>	<p>\$39,050</p> <p>complete</p>

	<p>Impact: Merridale Ciderworks Corp. hopes to have a new craft rum produced from 100% Island-grown raw products commercialized in 3-4 years.</p> <p>Please visit the Merridale Estate Cidery website for more information</p>	
<p>Birch Sap / INN091</p>	<p>Objective: To develop a new organic beverage from birch sap. Birch sap is not currently processed for the beverage market in North America.</p> <p>Result: The proponent achieved proof of concept, successfully harvested sap from birch, and processed it into an organic beverage. The product is low in calories and sugar content, and contains a range of minerals.</p> <p>Impact: To be determined Please visit the 52° North website for more information</p>	<p>\$81,606</p> <p>complete</p>
<p>Local Raw Pet Food Line / INN131</p>	<p>Objective: This project will develop a raw pet food line from locally sourced, sustainably produced, and hormone/antibiotic free animals. An innovative business model will also be developed to promote value-added opportunities for BC producers and processors.</p> <p>Result: <u>A new pet food line was developed and is being commercialized.</u></p> <p>Impact: <u>To be determined.</u></p> <p><u>For further information contact: Gillian Watt at the BC Association of Abattoirs</u></p>	<p>\$198,000</p> <p>complete</p>
<p>Manufacturing and Commercialization of new Agri-food products: H2Ω™ and HempΩ™ / INN095</p>	<p>Objective: Boreal Technologies Inc. has licensed a patent-pending process which uses nanotechnology to encapsulate hemp oil so that it can be mixed into an aqueous solution or further dried into powder. Boreal sought to construct the equipment required to produce two hemp oil products - H2Ω (H2Omega) and HempΩ (HempOmega).</p> <p>Result: Due to unforeseen cost overruns, the equipment construction was not successfully completed. Further funding is being sought.</p> <p>To be determined.</p>	<p>\$127,000</p> <p>terminated</p>

	<p><i>For more information, please visit the Boreal Technologies Inc. website</i></p>	
<p>New Cheese Product Packaging & Launch/ <i>INN137 SP</i></p>	<p>Objective: This project will create an adaptive tool for the packaging manufacturer to finalize the packaging design and labeling for a new cheese product. Result: The package and labelling has been developed and the product launched.</p> <p>Impact: To be determined.</p> <p><i>For more information, please visit the Farm House Natural Cheeses website</i></p>	<p>\$10,000</p> <p>complete</p>
<p>Professional Reformulation of Quinoa Quickies/ <i>INN287 SP</i></p>	<p>Objective: This project will re-formulate a commercial product to use quinoa produced by Canadian farmers. Result: Reformulation was not as successful as hoped and additional funding was provided under INN259 to improve the consistency.</p> <p>Impact: To be determined.</p> <p><i>For more information, please contact Blair Bullus from Top Tier Foods Inc.</i></p>	<p>\$9,750</p> <p>complete</p>
<p>Micro-Maltery Pilot Project/ <i>INN198</i></p>	<p>Objective: This project will test the feasibility of a small scale micro-malting facility to produce local specialty and custom malted grains for the growing craft brewing and distilling industries in BC. Results: A functional micro-malting machine was used to produce 5 good batches of malt. While the machine provided an automated alternative to raking the germinating malt, the amount of hands-on labour required for the small output was too costly.</p> <p><i>For more information, please contact Lorien Schramm from Pemberton Distillery Inc.</i></p>	<p>\$14,755</p> <p>complete</p>
<p>Commercialization of Vitality Power Iron + Organic Spirulina: Retail Introduction/ <i>INN302 SP</i></p>	<p>Objective: This project contributed to the initial commercialization efforts for Vitality Products', Power Iron + Organic Spirulina.</p> <p>Result: The launch was successful and the product was awarded the Silver for Consumer Choice - Women's Products – at the 2016 Alive Awards (www.alive.com/awards/2016/consumer-choice-womens-</p>	<p>\$10,000</p> <p>complete</p>

	<p>products).</p> <p>Impact: To be determined.</p> <p><i>For more information, please contact Cheryl Grant from Vitality Products Inc</i></p>	
<p>Development of Vacuum Sealed Kibble-Style Frozen Raw Pet Food/ INN232 SP</p>	<p>Objective: This project will develop innovative packaging to minimize freezer burn, oxidation and other negative effects of freezing on raw meat pet food during extended freezer storage.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Inna Shekhtman from Red Dog Deli Raw Food Company Inc.</i></p>	<p>\$9,500</p> <p>on-going</p>
<p>Shelf-Stable Soft Serve Mixes/ INN217</p>	<p>Objective: This project will develop dairy-based shelf-stable soft-serve mixes for distribution to the food service industry. Result: The project was unsuccessful.</p> <p><i>For more information, please contact Walter Dullemond of FTC International Consulting Ltd.</i></p>	<p>\$10,000</p> <p>complete</p>
<p>Freeze/Thaw Study for JillyV's Yogurt-based Jumpstarter/ INN244</p>	<p>Objective: This project will create a freeze/thaw formulation for a yogurt-based breakfast product. (yogurt, chia and oatmeal layered with fruit compotes).</p> <p>Result: The project was successful and the product is being sold through Save-on-Foods stores in Western Canada.</p> <p><i>For more information, please contact Jillian Hull of JillyV's Enterprises Ltd.</i></p>	<p>\$8,263</p> <p>complete</p>
<p>Bone Grinder Project/ INN201</p>	<p>Objective: This project will develop a specialized bone grinder for raw ungulate bone crushing which will result in a dry bone powder. Results: The project was</p>	<p>\$9,500</p> <p>complete</p>

	<p>unsuccessful.</p> <p><i>For more information, please contact Inna Shekhtman of Red Dog Deli Raw Food Company Inc.</i></p>	
<p>Development of Asian Style Sticky Quinoa/ INN259 SP</p>	<p>Objective: Funding will support the development of “sushi quinoa” – a type of quinoa with a sticky consistency to supply the sushi market as well as grocery and other services.</p> <p>Result: Reformulation has been completed and the product will be launched soon.</p> <p><i>For more information, please contact Blair Bullus from Top Tier Foods Ltd.</i></p>	<p>\$7,000</p> <p>complete</p>
<p>Development of a Small Scale In-bottle Pasteurization Process & Equipment/ INN254</p>	<p>Objective: This project will develop a scale appropriate pasteurization system for small scale farm-based cideries. Results: To be determined.</p> <p><i>For more information, please contact Mike Pepperdine from Sea Cider Farm & Ciderhouse</i></p>	<p>\$51,243</p> <p>on-going</p>
<p>Pilot and Demonstration for Diabetic Meal Replacement/ INN255</p>	<p>Objective: This project will pilot an innovative meal replacement drink mix for those with diabetes. Result: To be determined.</p> <p><i>For more information, please contact Raveen Kullar from ZUUN Nutrition</i></p>	<p>\$50,525</p> <p>on-going</p>
<p>Tamago Pilot Development & Commercialization/ INN275</p>	<p>Objective: This project will develop a commercial process to make Tamago, a sweet cooked omelet-like egg often used in sushi bars. Results: to be determined.</p> <p><i>For more information, please contact Louise Wagar from Vanderpol's Eggs Ltd</i></p>	<p>\$33,522</p> <p>complete</p>
<p>Bean Bites/ INN312</p>	<p>Objective: Big Mountain Foods will commercialize two new”Bean Bite” products.Results: To be determined.</p> <p><i>For more information, please contact Jasmine</i></p>	<p>\$32,800</p> <p>on-going</p>

	<i>Chamberland from Big Mountain Foods</i>	
Pilot Project to Develop Sustainable Products from Locally Farmed Insects/ INN277	<p>Objective: This project will pilot production a powdered consumer food product derived from insects and seek to obtain regulatory approval for the product from Health Canada.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Chris Blachut from Heilu</i></p>	<p>\$45,205</p> <p>on-going</p>
CauliCrumble/ INN261	<p>Objective: This project will commercialize the new product “CauliCrumble”. as a meat free alternative to soy and gluten.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Jasmine Chamberland from Big Mountain Foods</i></p>	<p>\$66,300</p> <p>on-going</p>
Exploiting the Health Benefits of a Novel Sourdough Fermented Pasta/ INN314	<p>Objective: This project will explore the health benefits of sourdough pasta. Results: To be determined.</p> <p><i>For more information, please contact Heidi Lettrari from Kaslo Sourdough</i></p>	<p>\$75,000</p> <p>on-going</p>
Hop Pelletizing Project: Making a better pellet for craft brewers/ INN282	<p>Objective: This project will research factors in the hop pelleting process that influence brewing.</p> <p>Results: To be determined</p> <p><i>For more information, please contact Sam Quinlan from HOOH Organic Hop Co. Ltd.</i></p>	<p>\$38,400</p> <p>on-going</p>
Identification and Selection of Non-Saccharomyces yeasts for use in developing aroma and flavour complexity in wine/ INN268	<p>Objective: This project will identify non-Saccharomyces yeasts from fermentations sampled in 2015 in an effort to create higher quality wines. Results: To be determined.</p> <p><i>For more information, please contact Daniel Durall from The University of British Columbia</i></p>	<p>\$18,000</p> <p>on-going</p>
Dual-Texture Gummy Production & Flexible	Objective: Create and package a new product, dual	\$130,000

<p>Green Packaging Capabilities/ INN285</p>	<p>textured gummy supplements, in BC.</p> <p>Results: To be determined</p> <p><i>For more information, please contact Musharaf Syed from Herbaland Naturals Inc.</i></p>	<p>on-going</p>
<p>Craft Sized Continuous Still Development and Build/ INN315</p>	<p>Objective: This project will design and build a continuous distillation system for medium to large craft distilleries. Results: To be determined.</p> <p><i>For more information, please contact James Lester from Sons of Vancouver Distillery</i></p>	<p>\$30,000</p> <p>on-going</p>
<p>Zero-Waste Water Buffalo Curds & Whey Production/ INN323</p>	<p>Objective: This project will develop a zero-waste processor of water buffalo milk to supply water buffalo curds. Results: To be determined.</p> <p><i>For more information, please contact Elisabeth Bond from Jollity Farm</i></p>	<p>\$65,395</p> <p>on-going</p>
<p>Vegan - nut free & dairy free Pesto Sauce/ INN272</p>	<p>Objective: This project will develop and pilot a vegan, nut and dairy free pesto sauce by Gramma Dees. Results: to be determined.</p> <p><i>For more information, please Doug Davidson from Gramma Dees Gourmet Snacks</i></p>	<p>\$5,000</p> <p>on-going</p>
<p>Regional Hops Drying Kiln (Pilot)/ INN273</p>	<p>Objective: This project will contribute to the costs of two European technologies for processing hops.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Brian Zaporozan from BC Hop Company</i></p>	<p>\$285,000</p> <p>on-going</p>
<p>A Functional Vegetable Based Dough; from development to commercial production/ INN292</p>	<p>Objective: This project will develop 3 – 5 fermented gluten free vegetable-based dough formulations using a microbial culture “starter” provided by UBC Faculty of Land and Food Systems research (NSERC Engage/MITACS funding). Results: To be determined.</p> <p><i>For more information, please contact Ken A. Schneider from Quejos Ancient Foods Inc.</i></p>	<p>\$76,010</p> <p>on-going</p>

<p>Commercialization of frozen and fresh Tamago/ INN327</p>	<p>Objective: This project will commercialize Tamango processed under the systems developed in INN275. Results: To be determined.</p> <p><i>For more information, please contact Louise Wagar from Vanderpol's Eggs Ltd</i></p>	<p>\$88,466</p> <p>on-going</p>
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Information Systems

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
<p>Development of an Added “Marketplace” feature to BC BeefNET / INN132</p>	<p>Objective: This project will modify the BC BeefNET website to allow buyers to sell or purchase portions of an individual carcass in specialty markets (e.g., Asian Food Service, secondary food processors, pet food manufacturers etc.).</p> <p>Result: BC BeefNET has been modified to allow chefs and stores to leave behind those cuts and part of the animal that they do not want for credit on their order.</p> <p>Impact: To be determined</p> <p><i>For more information, please see the BC Beef Network website</i></p>	<p>\$264,900</p> <p><i>complete</i></p>
<p>BC Beef Quality Information System – Pilot Auditing Program / INN134</p>	<p>Objective: This project will pilot an auditing program intended for producers using the BC Beef Quality Information System .</p> <p>Result: 51 site audits were completed and recommendations developed.</p> <p>Impact: To be determined.</p> <p><i>For more information about the BC Beef Quality Information System, please see the BC Association of Abattoirs website</i></p>	<p>\$60,080</p> <p><i>complete</i></p>
<p>Food Safety Software System – Commercialization of the Icicle Food Safety Platform / INN125</p>	<p>Objective: Tjis project will commercialize an affordable system (the Icicle Food Safety Platform) that will help small and medium sized food producers and processors manage their food safety documentation and 3rd party</p>	<p>\$104,665</p> <p>complete</p>

	<p>certification processes cost-effectively.</p> <p>Result: Critical learning was achieved in all 4 areas of importance for system commercialization: public relations, landing pages and marketing collateral, industry trade organization activities, and development required to access new markets.</p> <p>Impact: The system developer expanded their product offering to include additional setup, training, and consulting services to provide a complete solution that can take a medium-sized food processor from an early stage to a compliant and mature food safety program.</p> <p><i>For more information, visit the Burton Software website</i></p>	
<p>Commercialization of Icicle to selected target markets and related product development/ INN 220</p>	<p>Objective: Building on INN125 this project will focus on developing and commercializing food safety systems for larger food processors. Result: To be determined.</p> <p><i>For more information, visit the Burton Software website</i></p>	<p>\$187,500</p> <p>on-going</p>
<p>Grower Dashboard/ INN200</p>	<p>Objective: This project will develop a web-based grower dashboard system to streamline the data capture, improve efficiency for producers and provide real-time performance data.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Katie Lowe from the BC Chicken Marketing Board</i></p>	<p>\$39,750</p> <p>on-going</p>
<p>Commissary Connect – Value Chain Management Network/ INN293</p>	<p>Objective: This project will expand an existing system to network food processors so that suppliers can view availability of processing and book time slots online; create an online Members Portal to connected buying groups; create an online Sales Portal where orders can be placed from retailer and wholesalers directly.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Sarb Mund from Mundmedia Enterprises Inc.</i></p>	<p>\$137,160</p> <p>on-going</p>
<p>Improving quality through real time SOP (standard operating procedure) management/ INN298</p>	<p>Objective: This project will develop a software platform for standard operating procedures that meets the needs of small to mid-sized agricultural businesses.</p> <p>Results: To be determined.</p>	<p>\$79,750</p> <p>on-going</p>

For more information, Harvinder Johal of 1007918 BC LTD. dba SOP Software Systems

Knowledge Transfer

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
Beef Industry technology transfer system / INN127	<p>Objective: This project will identify innovative way of disseminating key research and technology information to B.C.'s estimated 4,800 beef producers.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined</p> <p>For further information contact: the BC Cattlemen's Association</p>	<p>\$132,194</p> <p><i>complete</i></p>
Path to Commercialization I and II: A guided process for BC food and beverage manufacturers / INN087 & INN119	<p>Objective: This program assists small and medium-sized BC food and beverage processing entrepreneurs to become more competitive through providing access to expert, one-on-one business coaching and training workshops.</p> <p>Result: The program successfully pioneered a guided business process for BC food and beverage manufacturing entrepreneurs, arming them with valuable information about financial resources, regulatory requirements, technology requirements, market awareness and labour management strategies.</p> <p>Impact: 44 entrepreneurs have completed the program since 2013. Nineteen (19) past participants have successfully launched or commercialized new products in BC markets. Participants anticipate creating at least 80 new jobs by 2017, with estimated sales increases of \$745K. Several past participants have recently won or been nominated for various industry awards.</p> <p><i>For more information, please contact the BC Food Processors Association</i></p>	<p>\$51,605</p> <p><i>complete</i></p>
Stimulating Healthy Eating - food industry action towards	Objective: Research was conducted to determine the effectiveness of social media in communicating product reformulations to establish a connection between	<p>\$85,000</p> <p><i>complete</i></p>

nutritional improvement / INN100	<p>nutritional improvement and purchase intent.</p> <p>Result: The project appears to have had a positive effect on increasing the awareness of healthy B.C. products that meet Provincial Healthy Eating Guidelines as evidenced by reports of increased product sales by participating companies, and increases in social media user statistics.</p> <p>Impact: Increased product sales among participating companies and increased awareness/dialogue about healthy eating choices.</p> <p><i>For more information, please contact the BC Food Processors Association</i></p>	
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Pest Management

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/Completion Date</i>
Insecticidal activity of unique lavender oils / INN082	<p>Objective: To investigate the insecticidal activity of two new varieties of lavender against Spotted Wing Drosophila, and to complete genetic sequencing of English lavender to facilitate development of genetic markers.</p> <p>Result: Extracts from lavender plants did not exhibit substantial insecticidal properties. A few new lavender lines were successfully propagated, and could represent new lavender cultivars. Genome sequencing was successfully completed</p> <p>Impact: This genome sequence is the first documented in the mint family, and will provide a valuable resource for genetic research, particularly into markers for genes responsible for regulation of essential oil production.</p> <p><i>For more information, please contact Soheil Mahmoud, Associate Professor at the University of British Columbia.</i></p>	<p style="text-align: center;">\$120,500</p> <p style="text-align: center;">complete</p>
Enterra Natural Fertilizer (Insect Digestate) as an Organic Wireworm Control / INN123	<p>Objective: Enterra Feed Corporation's new product, Enterra Natural Fertilizer (ENF), proved to be extremely effective at controlling wireworm, a soil pest of serious concern to crop farmers across BC. This project initiated the collection of data required for product registration, a key step in the product commercialization process.</p>	<p style="text-align: center;">\$98,030</p> <p style="text-align: center;">complete</p>

	<p>Result: As well as providing a good source of plant nutrition, ENF showed plant protection against wireworms as demonstrated in controlled greenhouse pot experiments and in field trials with low wireworm pressure.</p> <p>Impact: To be determined. <i>Please visit the Enterra Feed Corporation's website for more information</i></p>	
<p>Predaceous Mites for Biological Control of the Varroa Mite / INN158</p>	<p>Objective: To test a predaceous mite, <i>Stratiolaelaps scimitus</i>, as a biological control agent for <i>Varroa</i> mites in established and packaged honey bee colonies.</p> <p>Result: Study data showing no significant effect of treatment with <i>S. scimitus</i> on <i>Varroa</i> mite populations, colony vigour or honey production.</p> <p>Impact: Results showing no effect should save BC beekeepers from wasted time, effort, money and bees using an unproven solution for <i>Varroa</i> mite control. Trials with other predaceous mite species could hold further promise.</p> <p><i>For more information, please contact John Borden or visit Contech Enterprises Inc.</i></p>	<p>\$31,948</p> <p>terminated</p>
<p>Testing bioherbicides for weed control in cranberries, and insecticides for tipworm & fireworm / INN173</p>	<p>Objective: To test new bio-herbicides for weed control in cranberries, and three new insecticides for efficacy against tipworm and blackheaded fireworm.</p> <p>Result: Efforts to screen new bio-herbicides were not successful due to lack of available research product. Numerous studies assessed insecticide efficacy against cranberry tipworm and blackheaded fireworm. Sevin and bifenthrin provided the greatest and most consistent efficacy against tipworm. Altacor, bifenthrin and IKI-3106 all provided excellent control of fireworm (>99%), Entrust and Pyganic provided good control (~80-90%), and Grandevo, Venerate, and DiPel provided moderate efficacy (~50%).</p> <p>Impact: The grower standard, Altacor, is an exceptionally efficacious chemistry for fireworm. Registration of new chemistries, like bifenthrin and IKI-3106, would help with resistance management. Entrust, Pyganic, Grandevo, Venerate, and DiPel are all considered soft chemistries and all are certified for organic use.</p> <p><i>Please click here to read the full research report, or visit</i></p>	<p>\$8,389</p> <p>complete</p>

	<p>the Cranberry Marketing Commission website for further research results.</p>	
<p>Exploring Control of Foliar Cranberry Pests - Fireworm, Tipworm and Dearness scale - with Neem-based botanical insecticides / INN186</p>	<p>Objective: Neem essential oil contains compounds which have been shown to have insecticidal properties. This project conducted field trials for newly formulated neem-based botanical insecticides to control tipworm and fireworm on cranberries.</p> <p>Result: Preliminary trials suggest that both neem products are toxic to all three cranberry pests studied, with higher efficacy likely with one of the formulations (TER 447). Observations included both mortality and negative effects on development of immature stages of all three insects.</p> <p>Impact: To be determined</p> <p><i>For more information contact: Deborah Henderson at Kwantlen Polytechnic University.</i></p>	<p>\$2,500 complete</p>
<p>Developing new BC native fungal and viral microbial bio-control products; pilot scale for 3 new bio-pesticides / INN083</p>	<p>Objective: Building on past work, this project furthered the development of three new bio-control products for future product commercialization.</p> <p>Result: Field and greenhouse trials were successfully completed with mixed results.*</p> <p>Impact: Successful commercialization of new bio-control products will have considerable value to organic and conventional growers seeking chemical-free, integrated pest management (IPM) solutions.</p> <p><i>* For more information contact: Deborah Henderson at Kwantlen Polytechnic University.</i></p>	<p>\$196,192 complete</p>
<p>Evaluation of Spark™ Gas Treatment on Eliminating Pathogens and Pests on Greenhouse Surfaces / INN180</p>	<p>Objective: Greenhouse-based trials were employed to assess optimal conditions and dosing rates of the Spark™ gas treatment system for maximizing reduction of pathogens and insect pests.</p> <p>Result: Spark™ was shown to effectively suppress a wide range of pests and pathogens in the greenhouse environment, and could offer a sustainable alternative to currently favoured pesticides and bleach cleaning methods. Over 1100 samples of pathogens and insects were exposed and assessed to optimize dosing levels, frequency, and duration and to assess optimal greenhouse</p>	<p>\$198,131 complete</p>

	<p>conditions.</p> <p>Impact: When applied to the greenhouse environment, which can be accomplished through existing CO2 distribution systems, growers should experience significant repression of commonly troublesome pathogens and pests, with subsequent increases in crop yields.</p> <p><i>For more information, please contact the Institute for Sustainable Horticulture at Kwantlen University, Langley campus: (604) 599-3460, or TechMist Solutions, Inc.</i></p>	
<p>Ensuring Amblyseius fallacis for B. C. berry growers / INN152</p>	<p>Objective: This project will identify a new storage mite to provide a lower cost host prey for growing Amblyseius fallacis, a biocontrol organism for spider mites on berries.</p> <p>Results: To be determined.</p> <p><i>For more information, please see the Applied Bio-nomics website</i></p>	<p>\$204,375</p> <p>ongoing</p>
<p>Polyoxin D for Greenhouse Tomato Integrated Disease Management/ INN215 SP</p>	<p>Objective: This project is to demonstrate the safety and efficacy of using Polyoxin D for integrated disease management in tomatoes. This research will become part of a registration proposal package.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Linda Delli Santi from the BC Greenhouse Growers Association</i></p>	<p>\$7,370</p> <p>complete</p>
<p>Polyoxin D for Greenhouse Cucumber Integrated Disease Management/ INN 216</p>	<p>Objective: This project will demonstrate the safety and efficacy of using Polyoxin D for integrated disease management in greenhouse cucumbers. This research will become part of a registration proposal package.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Linda Delli Santi from the BC Greenhouse Growers Association</i></p>	<p>\$7,370</p> <p>complete</p>
<p>Identification of Pests, Diseases and other disorders in Blueberry Fields Mobile application/ INN209</p>	<p>Objective: This project will develop a mobile application to help producers identifying pests and diseases in the field and reduce environmental impact of pest and disease control programs. Results: To be determined.</p>	<p>\$ 30,063.50</p> <p>on-going</p>

	<p><i>For more information, Karina Sakalauskas from the BC Blueberry Council</i></p>	
<p>Earwigs for Biological Control: Evaluating a Much Maligned Insect as a Generalist Predator/ INN 193</p>	<p>Objective: This project will investigate the potential of earwigs to act as a biological control against several important insect pests in apple orchards, including the rosy apple aphid, leafrollers, budmoth and apple clearwing moth. which can have a serious economic impact on apple crops in years with high pest population densities. The project will determine earwig dispersal behavior, their diet preferences, evaluate their feeding capacity on various prey in the lab, and test their efficacy in the field. This project will also establish how current horticultural practices affect resident earwig populations and teach growers how to both rear and deploy earwigs in the orchard for pest control and enhance the resident populations in their own orchards.</p> <p>Results: To be determined.</p> <p><i>For more information, please contact Tamara Richardson from Cawston Cold Storage</i></p>	<p>\$140,160</p> <p>complete</p>
<p>Sustainable Greenhouse Insect and Pathogen Controls with Catalytic Pre-fogging, High-Redox Reactants and Infra-sound/ INN225</p>	<p>Objective: Building on the results of INN180 this project will develop specific dose rates under different environmental conditions. Results: To be determined.</p> <p><i>For more information, please contact Menno Koehoorn from TechMist Spray Solutions Inc.</i></p>	<p>\$185,775</p> <p>on-going</p>
<p>Fracture (BLAD protein) for Greenhouse Tomato Integrated Disease Management/ INN271</p>	<p>Objective: This project will conduct greenhouse tomato efficacy and crop tolerance trials with Fracture to develop information that will be used as part of a package requesting registration of Fracture as a pest management tool for greenhouse tomatoes.</p> <p>Results: to be determined.</p> <p><i>For more information, please contact Iris Bitterlich from BC Greenhouse Growers' Association</i></p>	<p>\$7,215</p> <p>on-going</p>
<p>Nitric Oxide Releasing Solution: A Novel Non-antibiotic Alternative for the Treatment of Bovine Mastitis/ INN274</p>	<p>Objective: This project will evaluate the effectiveness of a nitric oxide (NO) based compound as a non-antibiotic treatment for mastitis. Results: to be determined.</p> <p><i>For more information, please contact Dr Gilly Regev from Bovicor Pharmatech Inc</i></p>	<p>\$131,300</p> <p>on-going</p>

<p>Expanded Research on Management Options to Control Puncturevine and Longspine Sandbur/ INN286</p>	<p>Objective: This project will research methods to manage puncturevine and longspine sandbur in the Okanagan and Simiklameen Valleys.</p> <p>Result: To be determined.</p> <p><i>For more information, please contact Lisa Scott from Okanagan and Similkameen Invasive Species Society</i></p>	<p>\$6,500</p> <p>on-going</p>
<p>Armillaria root/crown rot of Blueberry: Identification, distribution, control strategies/ INN306</p>	<p>Objective: Armillaria root rot was recently discovered affecting some blueberry fields in BC, and it has become an issue of concern since there are no known fungicidal controls. The literature and some recent work suggest certain composts and Trichoderma may provide suppression, however little local work has taken place. This project will survey the presence and identity of Armillaria species in BC blueberry fields, and investigate potential sources of infestation. Further, it will screen the pathogen for sensitivity to a range of fungicides and follow up on recent reports that some soil amendments, compost and Trichoderma spp. could provide some measure of control.</p> <p><i>For more information, please contact Deborah Henderson from Kwantlen Polytechnic University</i></p>	<p>\$30,000</p> <p>on-going</p>

Plants

<i>Project Title/Code</i>	<i>Project Summary/ Project Lead</i>	<i>GF2 Funding/ Completion Date</i>
<p>BC Grown Hawthorn – New Product Research and Development / INN117</p>	<p>Objective: Hawthorn fruits are used in western herbal medicine as heart tonics and in far eastern medicine as a gastrointestinal aid. This project will develop three new hawthorn fruit products.</p> <p>Result: The applicant developed two promising products and will begin small scale commercialization of both products with an anticipated launch into the local market in the fall of 2016.</p> <p>Impact: To be determined.</p> <p>For more information please contact Jeanette Lee at the Naturally Grown Herb and Spice Producers Cooperative (HerbPro)</p>	<p>\$53,794</p> <p><i>complete</i></p>

<p>High Tunnel House for Red Currants / INN155</p>	<p>Objective: To investigate the efficacy of tunnel houses for improving the quality, appearance and yield of Red Currants, controlling disease and fungal pressures on these crops (i.e., Botrytis/mildew), and potentially advancing harvest dates.</p> <p>Result: Data showed no significant benefit, however results are considered inconclusive due to delays in tunnel house installation and environmental factors (i.e., dry weather resulted in unusually low mildew/Botrytis levels).</p> <p><i>For more information about this research, please contact: Joslin Sanderson.</i></p>	<p>\$10,000 complete</p>
<p>Demonstration of Bumble Bee and Indicator Plant Gardens / INN172</p>	<p>Objective: To assess the effectiveness of selected ornamental plants in attracting bumble bees and native pollinators to cranberry crops at the BC Cranberry Research Farm. Plants that bloom prior to and after cranberries were selected to ensure that bumble bees had the necessary resources for the entire season.</p> <p>Result: Catmint, Sedum and Heather, which bloom after cranberries, showed promise as pollinator attractants. Pre-cranberry bloom findings are still preliminary but bog rosemary appears to be promising. Findings also support the use of specific species of Rhododendron varieties for enhancing bumble bee activity. Ceanothus, Campanula and Callicarpa have potential as indicators for Dearness scale and cranberry fruitworm monitoring.</p> <p>Impact: Cranberries are dependent on European honey bees and native pollinators. This hands-on demonstration site provides the industry with data and experience so that growers can develop their own bumble bee garden plans using proven pollinator-attracting plant varieties, with potential to increase crop yields. Further, monitoring for the vulnerable stages of key pests is intensive; having knowledge of reliable plant indicator species could make monitoring much more efficient.</p> <p><i>Please click here to read the full research report, or visit the Cranberry Marketing Commission website for further research results</i></p>	<p>\$3,025 complete</p>
<p>Development of Tissue Culture Micro-propagation for Organic Greenhouse Production / INN077</p>	<p>Objective: Organic tissue culture micro-propagation is not currently available for most greenhouse crops. This project aimed to develop new plant tissue culture formulations and protocols compliant with organic</p>	<p>\$60,000 complete</p>

	<p>certification for organic greenhouse producers in BC.</p> <p>Result: Organic tissue culture micropropagation formulations and procedures for cucurbits were successfully developed and optimized. Proponents also succeeded in working with the Organic Federation of Canada to include tissue culture propagated plant material as an acceptable practice within their guidelines.</p> <p>Impact: ProgenyBio aims to expand this research into a pilot project incorporating this new technology in the production system of an organic cucumber greenhouse.</p> <p><i>For more information, please see the ProgenyBio website:</i></p>	
<p>Research to formulate and test fertilizer from biofuel by-products / INN078</p>	<p>Objective: To test the safety and efficacy of a new fertilizer made from the potassium glycerine (K-glycerine) by-product of biofuel production.</p> <p>Result: Efficacy results were crop dependent: alfalfa is the least sensitive to negative properties of glycerine at low concentrations; radish is negatively affected by glycerine application, but these effects may be manageable through delayed seeding practices; and lettuce was negatively affected by glycerine amendments under all conditions tested. No improved plant response was observed.</p> <p>Impact: To be determined.</p> <p><i>For more information about this research, please visit the Cowichan Energy Alternatives website</i></p>	<p>\$67,700 complete</p>
<p>Regional demonstrations of newly registered plant genetics / INN161</p>	<p>Objective: Seed selection is critical to a producer's economic success. This project will offer local grain producers with a selection tool to optimize seed selection choices.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined.</p> <p>For further information contact: Sharla Pearce at the BC Grain Producers Association</p>	<p>\$122,796.40 complete</p>
<p>Impacts to maturity and yield by adjusting</p>	<p>Objective: A study of the effects of seeding rates on</p>	<p>\$73,676</p>

<p>seeding rate for canola and wheat / INN163</p>	<p>wheat and canola crop maturity and yield.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined.</p> <p>For further information contact: Sharla Pearce at the BC Grain Producers Association</p>	<p><i>complete</i></p>
<p>Lentils demonstration of a new crop for the Peace region / INN164</p>	<p>Objective: Exploration of a new potential lentil crop for the Peace River region. Varieties chosen for testing will be tolerant to Clearfield® herbicide technology (known as CL lines) as lentils are already known to be poor weed competitors.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined</p> <p>For further information contact: Sharla Pearce at the BC Grain Producers Association</p>	<p>\$49,117</p> <p><i>complete</i></p>
<p>Quinoa demonstration of a new crop for the Peace Region / INN165</p>	<p>Objective: Exploration of the potential for growing Quinoa in the Peace River region. Study will involve crop trials over a number of years in a range of environmental conditions and locations.</p> <p><u>Result: Waiting for Report</u></p> <p><u>Impact: To be determined</u></p> <p><u>For further information contact: Sharla Pearce at the BC Grain Producers Association</u></p>	<p>\$24,558</p> <p><i>complete</i></p>
<p>Development of flax for northern climate / INN166</p>	<p>Objective: Flax is believed to be a viable commercial crop for the Peace River region. This project will seek new flax varieties that are early to mature with maximum yields.</p> <p><u>Result: Waiting for Report</u></p> <p><u>Impact: To be determined</u></p>	<p>\$73,676</p> <p><i>complete</i></p>

	<u>For further information contact: Sharla Pearce at the BC Grain Producers Association</u>	
Developing new genetics for improved production / INN167	<p>Objective: This project aims to consolidate data from plant breeders to support registration of new wheat, barley and oats varieties. Varieties will be selected based on positive agronomic traits such as yield and adapted maturity, and quality traits such as pest and disease tolerance.</p> <p><u>Result: Waiting for Report</u></p> <p><u>Impact: To be determined</u></p> <p><u>For further information contact: Sharla Pearce at the BC Grain Producers Association</u></p>	<p>\$49,117</p> <p><i>complete</i></p>
New field pea cultivators for northern Peace climates / INN168	<p>Objective: Field peas play a critical role in crop rotations for soil health. Developing a pea variety that could consistently be harvested before the beginning of September could increase the uptake of pea crops into rotations in the Peace River region. Early harvest (before September) reduces exposure of seeds to climate factors that lead to bleaching and lower quality products.</p> <p>Result: Waiting for Report</p> <p>Impact: To be determined</p> <p>For further information contact: Sharla Pearce at the BC Grain Producers Association</p>	<p>\$49,117</p> <p><i>complete</i></p>
Carrot and Parsnip Variety Trial / INN187	<p>Objective: Responding to the increased consumer demand for colorful carrots and parsnips, this project will explore the varieties that have good storage qualities and are best suited to growing conditions in Fraser Valley. Culinary aspects of the selected varieties will also be studied.</p> <p><u>Result: Waiting for Report</u></p> <p><u>Impact: To be determined</u></p> <p><u>For further information contact: Sandy Dunn at Lower Mainland Horticultural Improvement Association</u></p>	<p>\$7000</p> <p><i>complete</i></p>
Tree Fruits – New Innovations in the tree	Objective: To gain exposure to nursery practices and apple breeding programs in Western Europe with the	\$6,005

<p>fruit industry in Europe / INN116 SP</p>	<p>intent of obtaining commercial licences to bring new crop varieties to Canada for commercial production.</p> <p>Result: Promising varieties and practices were documented and shared with over 250 producers at presentations in April 2014, and apple samples were shared with BC Tree Fruits Ltd. Information materials were developed for posting on the BC Fruit Growers Association website.</p> <p>Impact: Potential for the propagation of new and innovative cultivars using innovative plant breeding methods adopted by BC nurseries.</p> <p><i>For more information, please visit the BC Fruit Growers Association website</i></p>	<p>complete</p>
<p>Development and demonstration of agricultural and pilot-scale processing practices for a rubber bearing plant in BC / INN076</p>	<p>Objective: To germinate and propagate a rubber-bearing plant, <i>Taraxacum kok-saghyz</i>, in field and greenhouse trials, and demonstrate pilot-scale rubber and inulin extraction and processing methods.</p> <p>Result: The study resulted in successful germination, seed harvesting, and plant propagation trials. Samples of rubber and inulin were successfully extracted. Pest and disease control methods were explored. Pilot-scale processing machinery was set up and tested.</p> <p>Impact: The project continues having received additional funding from the federal government and INN239.</p> <p><i>For more information, please contact Anvar Buranov at Nova Bio-rubber Green Technologies Ltd.</i></p>	<p>\$125,000</p> <p>complete</p>
<p>Proof of concept for a light dispersing plastic covered pod concept greenhouse / INN121</p>	<p>Objective: The University of Fraser Valley aims to pilot a Vertical Growing System combined with innovative, light diffusing covered greenhouses in the BC lower mainland. The system is designed to greatly advance the yield potential and urban application of greenhouses while reducing the investment and cultivation costs of traditional greenhouses.</p>	<p>\$221,520</p> <p>ongoing</p>
<p>Foliar Nutrient Practices for Improved Blueberry Yield / INN208</p>	<p>Objective: British Columbia's blueberry industry is an economic powerhouse, delivering premium-grade product to marketplaces around the globe. This strength is dependent on growing the world's most advanced varieties with the best horticultural practices available. 'Draper' is a variety that presents many opportunities to the local industry due to its superior fruit size, firmness,</p>	<p>\$38,500</p> <p>in-progress</p>

	<p>flavor, ease of harvest and the positioning of its ripening period between the primary early-season and mid-season varieties (i.e., ‘Duke’ and ‘Bluecrop’, respectively). Along with opportunities, ‘Draper’ also poses some challenges, including a physiological deficiency that results in premature drop of green fruit under BC’s specific climatic conditions. This results in a loss of up to 40 percent of the fruit in some fields, which translates to decreased revenue and profit for many growers. Complementary to work conducted in 2014, the proposed project will recommend a set of improved management practices to mitigate this condition using foliar calcium spray applications. Specifically, rates and timings of applications will be determined so that they can be recommended to growers with affected fields. This will result in increased marketable yields and, therefore, improved profits. This work is vital to the continued viability of BC’s blueberry industry, an important player in the local economy.</p> <p><i>For more information, please contact Debbie Etsell from the BC Blueberry Council</i></p>	
<p>Evaluation of Azolla products for BC greenhouse and field grown crops/ INN248</p>	<p>Objective: This project is intended to demonstrate two new biofertilizer products based on Azolla-Anabaena; one in liquid and the other in powder form. Activities include the evaluation of powder and liquid Azolla efficacy and determine optimal application rates for both in field (beans and broccoli) and greenhouse (lettuce and cucumber) crops and to initiate development of a new cyanobacteria biofertilizer product.</p> <p><i>For more information, please contact Dr. Asalatha Mand from FarmPlant Products Canada Inc.</i></p>	<p>\$90,135 on-going</p>
<p>Determining if Winter Wheat can Survive Northern Climates/ INN162</p>	<p>Objective: Regional demonstrations of newly registered plant genetics enables the development of local performance data for producers to use in the selection of varieties on their farm. Only varieties that have been registered for commercial production are grown for this project. This also provides an opportunity for local seed growers to be some of the first in Canada to produce seed for the new varieties for duplication to become right into line with the future commercial demand. Proper seed selection has potentially huge ramifications to a producer's economic success story and this project will offer local producers the selection tool needed to optimize these choices.</p>	<p>\$57,537 complete</p>

	<i>For more information, please contact Sharla Pearce from the BC Grain Producers Association</i>	
Demonstration of the entomovectoring potential of Bombus species for Prestop Mix in greenhouse tomatoes/ INN245	<p>Objective: This small project is to demonstrate the use of bees to deliver a biocontrol product in greenhouse tomatoes.</p> <p><i>For more information, please contact Deborah Henderson from Kwantlen Polytechnic University</i></p>	<p>\$9,006</p> <p>complete</p>
Use of Humic acid as foliar nutrition in organic vineyards/ INN184	<p>Objective: The proposed project aims to conduct a preliminary study to determine the effectiveness of on spray application of commercially available 12% Humic acid (Organo Liquid Hume, Black Earth LP) as a foliar nutrient to enhance crop vigor, yield & juice quality of wine grape variety 'Zweigelt' in a commercial organic vineyard. The humic acid will be sprayed in two different concentrations during three stages of growth cycle of the vines. Data will be recorded for crop vigor, crop quality and quantity. Chemical analysis of grape juice (pH, Brix and TA) will also be done in our lab.</p> <p><i>For more information, please contact Karnail Singh Sidhu from Kalala Organic Vineyards Ltd.</i></p>	<p>\$4,300</p> <p>complete</p>
Demonstration of Bumble Bee and Indicator Plant Gardens (Year 2)/ INN233 SP	<p>Objective: Pollination of cranberry flowers is most efficiently done by bumble bees including those native to the Fraser Valley. Bumble bees can be an important back up to the pollination service expected from rented European honey bees. The challenge in using native bumble bees as pollination insurance for a specific crop is in bloom and in large enough numbers. This may be possible if bumble bee queens overwinter and establish hives near fields. In order to do this queens and workers need pollen and nectar sources both prior to cranberry bloom and after bloom. While bumble bees can potentially utilize any source of pollen and nectar, they have clear preferences for certain types of plants and not all types of pollen are of equal quality for bee development. In addition to food, shelter, both for building hives and for queens to overwinter is needed. 2015 research would build on the work begun in 2014 and will include data collection on bumble bee visits (numbers and species) to the bumble bee garden, field edges and cranberry fields. Taking into account the year-to-year variation in weather and pollination in the lower mainland, the two years of research will provide growers adequate information on commonly recommended "bee-friendly" plants and to make observations on the use of these plants for a bee garden.</p>	<p>\$1,650</p> <p>complete</p>

	<p>As well, a second year will allow for the continuation to monitor the phenology of plants identified in Year 1 as potential indicators for Dearness scale, cranberry fruitworm and blackheaded fireworm. In 2014, it was observed that the timing of bloom events for Campanula, Ceanothus and Callicarpa corresponded to Dearness scale crawler emergence and cranberry fruitworm egg laying. This second year of research would allow for the continuation of collecting data to confirm if these associations are reliable indicators or not.</p> <p><i>For more information, please contact Dianne Driessen from BC Cranberry Marketing Commission</i></p>	
<p>Intelligent Cherry Pathogen Monitoring and Testing/ INN222</p>	<p>Objective: Flex Alert Company has developed several technologies to be applied to cherry orchards and cherry storage facilities, based on patented biosensors to monitor pathogens in pre-harvest and post-harvest environments. Data collected and stored in a server-based database will provide access for intelligent analysis and decision-making. The objective of this proposal is to implement this combination of technologies in a pilot program with our partners - Okanagan Valley cherry growers. Such technology will make Canadian cherry growers much more competitive on the Asian markets, a priority for Canadian agriculture and improve the quality control for Canadian public.</p> <p><i>For more information, please contact Jacek Chrostowski from Flex Alert Company Ltd.</i></p>	<p>\$187,500 on-going</p>
<p>Adoption of innovative applied biological controls for British Columbia flower growers on seasonal crops/ INN240</p>	<p>Objective: The goal of the project is to accelerate the adoption of biocontrol practices in British Columbia flower greenhouses and in particular address the challenges of thrips control as a priority. Thrips, in particular, is tremendously damaging and a difficult to control pest for the greenhouse floriculture industry and the one pest for which new control strategies are available but not successfully integrated into production practices. However other pests will be targeted in this project. This project will test biocontrol practices for thrips control under spring, summer, fall and winter growing conditions in the unique climate of the Fraser Valley in British Columbia where a vast majority of floriculture farmers are located in the province.</p> <p><i>For more information, please contact Cary Gates from Flowers Canada Growers Inc.</i></p>	<p>\$120,030 on-going</p>

<p>Improved sprouter – production-ready prototype/ INN313</p>	<p>Objective: This is a project to design, build and test a prototype for an improved sprouter device. This sprouter design will address deficiencies in the commercially available equipment presently in use at Eatmore Sprouts & Greens Ltd. (ESG). The goal of this project is to finalize the design for production. It can then be used to replace the existing sprouters at ESG and be made available to the sprout-growing industry.</p> <p><i>For more information, please contact Carmen Wakeling from Eatmore Sprouts & Greens Ltd.</i></p>	<p>\$46,085 on-going</p>
<p>Field Evaluations of University of Saskatchewan Advanced Haskap (Lonicera caerulea) Selections in BC/ INN278</p>	<p>Objective: Haskap industry in BC is still at its early stage of development mainly due to (a) lack of information on adaptability of these new Haskap varieties (b) unavailability of cultural management practices suitable for BC soil and climatic conditions; and (3) unavailability of planting materials from breeder’s selections for field experimentation and commercial scale fruit production. FloraMaxx intends to undertake (a) micropropagation, and (b) field evaluations of Advanced Haskap Selections based on their agronomic performances grown at different agro-climatic regions in BC.</p> <p><i>For more information, please contact Dr. Ashish Dave of FloraMaxx Technologies Ltd.</i></p>	<p>\$42,500 on-going</p>
<p>Cash Crop & Bioenergy Crop Feasibility Study Bulkley-Nechako Regional District/ INN300</p>	<p>Objective: o assess the feasibility for rural agricultural communities and First Nations in the Bulkley-Nechako Regional District (BNRD) to grow locally appropriate, unique cash crops and non-invasive, non-woody, agricultural bioenergy crops (herein referred to as ‘cash crops’ and ‘bioenergy crops’) to increase the value per acre of cultivated agricultural land, encourage the use of fallow and unused agricultural land, and generate local employment</p> <p><i>For more information, please contact Steve Helle from University of Northern British Columbia</i></p>	<p>\$55,000 on-going</p>

<p>Early stage prediction and detection of biogenic health issues in ornamental plants/ <i>INN264</i></p>	<p>Objective: We want to conduct collaborative research with EIS to identify specific ornamental plant stress signals and develop algorithms that allow us to adopt and utilize EIS technology in our operation. We also want to test the functionality of the system under real-world conditions and help EIS with required design modifications.</p> <p><i>For more information, please contact Dave Van Belle from Van Belle Nursery</i></p>	
<p>Monitoring Cherry Rot And Its Predictive Preharvest Analysis/ <i>INN283</i></p>	<p>Objective: The goal of the project is to develop a predictive model for postharvest rot in the Okanagan, based on data collected on weather/soil conditions, pathogen incidence in the orchard, pathogen physiology and postharvest rot occurrence. This will allow growers to better manage their orchards during the growing season, improve fruit quality and reduce economic losses.</p> <p><i>For more information, please contact Jacek Chrostowski from Flex Alert Company Ltd.</i></p>	<p>\$97,000 on-going</p>
<p>Demonstrate and develop market for TerraBioGen M1 in the floriculture industry/ <i>INN301</i></p>	<p>Objective: The proposed project is intended to build on trials conducted in 2015 on lobelia and poinsettia which showed that with TerraBioGen M1 treatment, the plants established faster, flowered sooner, and lasted longer (or recover better) under water stressed conditions such as a retail environment. There are indications that we can offer plants with greater vigour, water stress tolerance, and resistance to soil borne pathogens, which will sell better to wholesalers and retailers. The ultimate result from treatments would be a longer lasting quality floriculture product produced at a lower cost.</p> <p><i>For more information, please contact Blair Heffelfinger from TerraBioGen Technologies Inc.</i></p>	<p>\$37,500 on-going</p>
<p>Development of autonomous nursery robotic system/ <i>INN322</i></p>	<p>Objective: Foresight Accelerator has conducted extensive global market research for Advanced Intelligent Systems Inc. Based on this study, we know that handling of container-based shrubs in greenhouse nurseries, requires extensive labour efforts due to staggering number of containers. In Canada, US and EU labour is costly and is prone to sprain and strain injuries and is not always available, resulting in hiring of foreign temporary workers with related relocation, housing and</p>	<p>\$100,000 on-going</p>

	<p>insurance costs. To address these challenges, Advanced Intelligent Systems has developed a Version 1 of an Unmanned Ground Vehicle (UGV) robot to replace the labour and save money.</p> <p><i>For more information, please contact Robert Vahedi from Advanced Intelligent Systems Inc.</i></p>	
<p>Use of Aerial Imagery for Tree Fruit Orchard Mapping/ INN307</p>	<p>Objective: Summerland Varieties Corp. (SVC) is proposing to test unmanned aerial systems (UAS) or rotary winged drones with remote sensing capabilities to quickly and cost effectively map tree fruit orchards in the Okanagan and Similkameen Valleys. The objective is to (1) accurately count the number of apple and cherry trees in an orchard, (2) correctly identify apple and cherry varieties, (3) characterize tree vigour and crown density, and (4) identify areas, numbers, and varieties of stressed trees.</p> <p><i>For more information, please contact Frank Kappel from Summerland Varieties Corp.</i></p>	<p>\$10,000</p> <p>on-going</p>
<p>Assessment of shelf life and fruit quality in blueberries/ INN309 SP</p>	<p>Objective: The proposed study is an extension/complementary component of the study which is currently underway aimed at assessing the shelf life of hexanal- treated and SA- treated and untreated control- blueberries. Hexanal has been found to increase the fruit firmness in several soft fruits such as tomato, sweet cherries. The proposed pilot study is aimed to determine (if any) the effect of fruit firmness on Spotted Wing Drosophila (SWD) pressure on the treated fruits. Enhancing fruit quality and extending shelf life in blueberries using these compounds will have marked impact on the ‘marketability’ and ‘exportability’ of Canadian blueberries.</p> <p><i>For more information, please contact Rangathilakam Krishnaraj from PhytoInformatix</i></p>	<p>\$4,703</p> <p>on-going</p>

<p>Demonstration of okra and eggplant field production in the Fraser Valley/ INN310 SP</p>	<p>Objective: Demonstration trial to collect data on field performance of okra and eggplant varieties in local fields. In addition to field performance, consumer and buyer response to local available okra and field eggplants will also be determined. Goal is to increase diversity of field vegetable production specifically, to meet needs of local ethnic markets.</p> <p><i>For more information, please contact Dr. Renee Prasad from University of the Fraser Valley</i></p>	<p>\$7,000</p> <p>on-going</p>
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Technology

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
<p>Thermal energy storage using eutectic salts to extend greenhouse viability / INN135</p>	<p>Objective: This project explored the viability of using bottles of eutectic salt solutions - a phase change material (PCM) - to passively heat a greenhouse, eliminating the need for hydro power and allowing year-round operation of the greenhouse.</p> <p>Result: The technology led to a statistically significant positive contribution to the inside temperature of the greenhouse, and the study led to a number of practical improvements to the PCM installation & design. Monthly data compared to the previous year without PCM indicate a gain of 6-8 degrees F inside the greenhouse when the PCM was present.</p> <p>Impact: This method offers a solution to heat storage in off grid greenhouses, with the potential to grow new crops and/or extend the growing season in these areas.</p> <p><i>For more information, visit the Carmenia Farm website</i></p>	<p>\$2,138</p> <p>complete</p>
<p>Natural Sweeteners Encapsulated Pilot /INN122</p>	<p>Objective: NutraEx sought to pilot a new way of encapsulating stevia, a natural sweetener, in a manner that improves the flavour profile and quality of reduced sugar foods – a product with the same taste as sugar but with fewer calories.</p> <p>Result: The project successfully demonstrated that the new encapsulation process can be dramatically scaled up and NutraEx is currently in the process of preparing a patent application and pursuing commercialization of the</p>	<p>\$75,000</p> <p>complete</p>

	<p>technology.</p> <p>Impact: To be determined. <i>For more information, see the NutraEx website:</i></p>	
<p>Risk Based Decision Support Tool for Managing Mixed Used Community Watersheds / INN146</p>	<p>Objective: Cattle grazing can lead to microbial contamination of drinking water when faeces enter streams within multi-use community watersheds. This project will develop a science-based decision support tool that is applicable across community watersheds, and consistent in terms of its analysis and identification of optimal best management practices for mitigating contamination risk.</p> <p><u>Result: A project website was established and populated with summary pages and data on each of the 122 community watersheds in the province of BC which contain crown grazing pastures.</u></p> <p>http://www.watersheds.ok.ubc.ca</p> <p>http://www.watersheds.ok.ubc.ca/wiki/index.php/Community Watersheds with Pastures</p> <p><u>Summary data and information on the 345 community watersheds not containing crown grazing pastures will be added as part of future projects.</u></p> <p><u>Impact: To be determined</u></p> <p><u>For further information contact: Deborah Roberts at the University of British Columbia</u></p>	<p>\$33,513</p> <p><i>complete</i></p>
<p>Horticulture Industry - Taking Action To Reduce the Spread of Invasive Species / INN148</p>	<p>Objective: This project aims to develop innovative web- and app-based tools to assist the horticulture industry in learning about invasive plants, and identifying regionally appropriate and economically viable alternative species. The ultimate goal is to curb the inventory and sale of invasive species by the horticulture sector.</p> <p><u>Result: The development of the mobile application, webpage and e-tools are now in place to allow for industry (and public) education on invasive plants, promotion of responsible industry leaders and easy-access to much-needed information and distribution of invasive plants, their safe alternatives and where to purchase them.</u></p>	<p>\$131,700</p> <p><i>complete</i></p>

	<p>www.beplantwise.ca</p> <p><u>Impact: To be determined</u></p> <p><u>For further information contact: Gail Wallin at Invasive Species Council of BC</u></p>	
<p>Best Management Process (BMP) for protecting drinking water from pathogens from cattle grazing / INN149</p>	<p>Objective: This project will examine the effectiveness of Best Management Practices (BMPs) in mitigating water quality impacts resulting from cattle grazing in mixed-use community watersheds. BMPs include: (1) key area restricted grazing; (2) off-stream watering; and (3) controlled access (custom fencing). Project activities include structured water and faecal matter sampling and DNA analysis to determine the source of problematic pathogens.</p> <p><u>Result: The goal was to determine whether the BMPs were effective in mitigating the hazard, the circumstances and conditions under which they were effective, and how the results of the BMPs could most effectively and efficiently be applied to other community watershed situations in which cattle grazing also exists. The report summarizes the body of research conducted from 2013 to 2015, its methods, findings, and recommendations for subsequent research.</u></p> <p><u>Final Report:</u> http://www.biosolutions.ubc.ca/wordpress/wp-content/uploads/Final-Report-V2-with-appendices.pdf</p> <p><u>Impact: To be determined.</u></p> <p><u>For further information contact: Deborah Roberts at the University of British Columbia</u></p>	<p>\$44,000</p> <p><i>complete</i></p>
<p>The Gumby Tag Project / INN151</p>	<p>Objective: Keeping electronic RFID tags on cattle is a continuing industry challenge. This project will test an innovative new design concept for livestock identification tags with a goal of increasing retention rates.</p> <p><u>Result: A specialized UHF RFID cattle tag was developed and longer term field testing of the Gumby tag has been initiated.</u></p> <p><u>Impact: To be determined.</u></p> <p><u>For further information contact: Jeff Braisher at KRL</u></p>	<p>\$109,904</p> <p><i>complete</i></p>

	<u>Solutions Ltd.</u>	
Design Energy Efficient LEDs Produce growers / INNI89	<p>Objective: QuantoTech will design, fabricate and test novel, energy-saving LED fixtures in cooperation with commercial greenhouse growers. This project will determine the light levels required for leafy greens and culinary herb production by using high or low light intensity LEDs, and calculate energy consumption and savings based on light intensity.</p> <p>Result: Novel LED fixture designs were demonstrated at growers locations. The project showed that LEDs (i) reduce energy requirements; (ii) maintain quality in a wide variety of crops at recommended light levels and spectra (coloured wavelengths); and (iii) produce marketable crops.</p> <p>Impact: To be determined.</p> <p>For further information contact: Christia Roberts at QuantoTech Solutions Ltd.</p>	\$40,450 <i>complete</i>
Intelligent crop-health monitoring system / INNI75	<p>Objective: Ecoation Innovative Solutions Inc. is developing technology that rapidly and precisely measures plants' responses to internal and external stressors using a mobile wireless sensory system that allows data collection at the individual plant level. The system collects data on minute changes in crop health related to pests and diseases as well as nutrient and water deficiencies before the symptoms become visible. The system triggers an alarm the moment the crop is impacted, thus supporting a low cost, targeted response that will minimize crop loss.</p> <p>Result: A 4th generation prototype was developed based on field testing in a commercial environment and the system managed to identify unhealthy plants at greenhouse and open field sites with precision.</p> <p>Impact: Additional funding was received via INN264 to test the technology in a nursery setting.</p> <p>For further information contact: Dr. Saber Miresmailli at Ecoation Innovative Solutions Inc.</p>	\$207,200 <i>complete</i>
CurVbrush INN096	<p>Objective: This product was invented to help grape growers with the removal of suckers, reducing labour costs and back pain.</p>	\$12,500 <i>withdrawn</i>

<p>Alternative Feed Production System for Small Ruminants/ INN213</p>	<p>Objective: The applicant is proposing to construct an alternative feed production system to produce fresh green forage for their herd of 85 dairy goats. To do so, they will build a hydroponic system from inexpensive, off-the-shelf components that will convert whole barley seeds into thick mats of sprouted fodder in 6 days. They expect to realize reductions in feed costs, improved animal health and production, as well as providing their farm a path to transition to an organic dairy. Over the course of the project, they will carefully record and detail all costs and labour associated with the operation of the system, as well as the outputs it generates. They will disseminate the knowledge gained from the project via a dedicated website, social media, email communications with relevant individuals and associations, and through several open houses held over the project's timeframe.</p> <p><i>For more information, please contact Cory Spencer from The Happy Goat Farm and Dairy</i></p>	<p>\$26,100 on-going</p>
<p>Reducing Salmonella and Campylobacter contamination of poultry/ INN250</p>	<p>Objective: Campylobacter and Salmonella species are the most common, culture-proven causes of bacterial gastroenteritis worldwide. Poultry products are the major reservoir and are the most commonly implicated foods for both Campylobacter and Salmonella infections in humans. The contaminated chicken products cause a huge economic loss to poultry industry in Canada. The goal of this proposal is to reduce the load of both Campylobacter jejuni and Salmonella enterica serovar Typhimurium (S. typhimurium) in the digestive tract of chickens using different methods. Garlic-derived organosulfur compounds will be identified and the treatment to either chicken house or chickens with the microencapsulated sulfur compounds will reduce the numbers of broilers colonized with C. jejuni and Salmonella. Further, a de novo approach will be developed to identify lactobacilli with probiotic activity to decrease or reduce the load of C. jejuni and S. typhimurium in the intestines of chickens. Finally, we will construct an engineered Lactobacillus bacteria strain that displays immunogenic epitopes of C. jejuni and S. typhimurium colonization associated proteins. This vaccine strain will stimulate the production of protective antibodies, resulting in a reduction in pathogen colonization. In sum, these developed intervention strategies will be important to reduce the occurrence of both Campylobacter and Salmonella in chickens. The technology developed in this research project will be patented and licensed to biotechnology and poultry</p>	<p>\$130,000 on-going</p>

	<p>companies in Canada.</p> <p><i>For more information, please contact Dr. Xiaonan Lu from The University of British Columbia</i></p>	
<p>Designing a multiplex diagnostic kit for simultaneous detection of 4 major pathogenic bacteria/ INN171</p>	<p>Objective: The present study is considering to design a multiplex diagnostic kit, which will be able to detect simultaneously 4 major pathogenic bacteria relevant to different food products. The detection kit will be transferred to a freeze dried form, tested with pure cell cultures and different artificially contaminated real food samples. The first objective of this study is to develop a reliable, useful and cost effective multiplex diagnostic kit for detection of 4 major food borne pathogens. The second objective of this project is transforming of the kit to a freeze dried format. Freeze dried form of developed detection kit can be stored and shipped at room temperature and so provide a cost effective, convenient means for testing laboratories, food companies, and other interest organizations, with limited access to laboratory facilities and skilled technicians.</p> <p><i>For more information, please contact Rahim Habibyan from SFE Laboratories Inc.</i></p>	<p>\$249,250</p> <p>complete</p>
<p>Selective attenuation of Salmonella in poultry using novel feed additives/ INN192</p>	<p>Objective: Utilizing state-of-the-art technology and scientific approaches, the applicant has identified virulence targets vital and unique to Salmonella. This project will focus on developing naturally occurring proteins that, when orally administered, will selectively bind to these targets and intervene disease and proliferation in the GI of the poultry. This will be accomplished by: 1. Selecting proteins that bind with high affinity in vitro to the targets and live Salmonella. 2. Selecting proteins that demonstrate their effectiveness in intervening with live Salmonella infectivity and proliferation in vitro. 3. Selecting proteins that, when administered orally, remain intact in the GI. 4. Demonstrating that the protein can reduce salmonella GI levels by log 6 after oral administration. 5. Demonstrating a dose dependent efficacy and safety in live flocks. 6. Optimizing and scaling up manufacturing of the protein for large-scale validation of efficacy and safety.</p> <p><i>For more information, please contact Sammi Wu from NovoBind Livestock Technologies Inc.</i></p>	<p>\$555,000</p> <p>on-going</p>

<p>Agri-Laser Bird Control/ INN214 AE</p>	<p>Objective: The purpose of this project is to gain and share new knowledge in the field of protecting sweet cherry crops against bird damage. We are pursuing new technology proving to be beneficial to fruit growers in Europe and incorporate the system into the Okanagan environment. Bird control continues to be problematic for Okanagan fruit growers and we need to continue to look for solutions to mitigate the problem in a way that is safe on the environment. The Agrilaser Autonomic is new innovative technology that Europeans are using for effective bird control in their orchards. This product is safe on the environment and to humans and if proven successful, will be a great option for cherry, grape and berry growers of the Okanagan Valley. The project would include:</p> <ol style="list-style-type: none"> 1) setting up of the Agrilaser Autonomic equipment and program, 2) evaluating the data and comparing it to other bird control methods, and 3) transferring the knowledge to growers through newsletters, summary papers, and field days. <p><i>For more information, please contact Gayle Krahn from Coral Beach Farms Ltd.</i></p>	<p>\$12,700 on-going</p>
<p>Commercialization and adoption of growing and processing technologies for Taraxacum kok-saghyz (TKS)/ INN239</p>	<p>Objective: Expansion of growing and processing activities for Taraxacum kok-saghyz (TKS) will be carried out to commercialize and adopt technologies for the production of natural rubber and inulin at industrial settings. Growing activities and field trials will be carried out on 2 and 10 acres of farmland. Specific seed and root harvesting equipment will be purchased and staff will be trained. Demo green processing facility with the annual capacity of 100 tons of rubber and 100 tons of inulin will be built. Proprietary equipment will be installed and certified in a dedicated processing facility with 2500 sqft. accessory processing equipment for processing facility will be purchased, installed and certified. Green processing facility will be tested and optimized. Natural rubber and inulin will be produced at industrial settings. The certificate of analysis for natural rubber and inulin</p>	<p>\$295,000 on-going</p>

	<p>will be obtained from certified labs.</p> <p><i>For more information, please contact Anvar Buranov from Nova-BioRubber Green Technologies Inc.</i></p>	
<p>Antibiotic Free Broiler Chicken Production/ INN253</p>	<p>Objective: Currently there is no standard or guideline for ABF production in BC. The current management and feed input practices will provide the base for the trials. The research will start at these minimums and build to eliminate practices that are not applicable to all producers. The project will help identify management details such as space required per bird, lighting programs, and feed composition that will give the producer the most current information on how to successfully grow ABF chicken. Production data such as body weight, water intake, feed intake, gut morphology will be gathered daily and recorded. Feed nutrient composition and feed additive efficacy will be compared with non trial data from commercial facilities on current ABF program. At the end of each trial data will be compared between the research facility and the commercial facilities in order to determine which practice has resulted in successful production.</p> <p><i>For more information, please contact Traci Wautier from Nutrichick Feed Consulting</i></p>	<p>\$58,650</p> <p>on-going</p>
<p>Pilot Plant Development of VITAGOS™/ INN303</p>	<p>Objective: Vitalus Nutrition Inc. has pursued the production of Galacto-oligosaccharides (GOS) as target value-added product using milk permeate (a by-product of dairy processing). With the help of the IAF funding in previous years (INN102 and INN188), we have conducted a pilot trial to identify technologies for production, and designed the process, surge plan, and layout for GOS production. The next stage of the project is to conduct a commercialization pilot trial to produce VITAGOS™ samples within specification for customer validation and approval.</p> <p><i>For more information, please contact Mayuri Chandra from Vitalus Nutrition Inc.</i></p>	<p>\$274,643</p> <p>on-going</p>

Waste to Resource

<i>Project Title/Code</i>	<i>Project Summary</i>	<i>GF2 Funding/ Completion Date</i>
<p>Demonstration of Nutrient Recovery System for Dairy Manure and Digestate / INN159</p>	<p>Objective: The Trident Nutrient Management System will be piloted at Seabreeze Dairy Farm with a goal of processing a combination of raw manure and digestate from the on-site anaerobic digester into value-added products (i.e., recycled water, bedding, nutrient fertilizer). This system has been shown to be effective at the 4000 cow level; this project focuses on down-scaling the process to a typical BC farm scale (i.e., 200-250 cows).</p> <p><i>For more information, please see the Trident website</i></p>	<p>\$325,900</p> <p><i>ongoing</i></p>
<p>Co-production of renewable heat and carbon dioxide using landfill gas / INN178</p>	<p>Objective: Quadrogen Power System Inc., in collaboration with Village Farms Inc. (the largest greenhouse in B.C.) is demonstrating the use of an innovative waste gas cleaning “quad-generation” process to co-produce renewable electricity, hydrogen, heat and greenhouse quality carbon dioxide (CO₂) from the City of Vancouver’s landfill gas. The renewable heat and food grade CO₂ are intended for use in the greenhouse, while electricity and hydrogen are intended for commercial markets.</p>	<p>\$196,995</p> <p><i>ongoing</i></p>
<p>Fertilizer development from biodiesel production and Free Fatty Acid (FFA) cleaning / INN185</p>	<p>Objective: Earth Renu aims to develop a potassium phosphate fertilizer suitable for BC agriculture industry from by-products of their Free Fatty Acid (FFA) cleaning process (to upcycle cooking oil) and biodiesel production.</p> <p>Result: The project proved at a lab-scale that the production of the fertilizer was technically feasible with a relatively simple process. The input output economics appeared positive at today’s energy prices. All the fertilizer grades produced from the process performed in the field as well as the existing commercial fertilizers. A new source of fertilizer for the region produced from an underutilized resource may be possible if the process can be confirmed at a pilot/pre-commercial phase.</p> <p>Impact: To be determined</p> <p><i>For more information, visit the Earth Renu website</i></p>	<p>\$45,875</p> <p><i>complete</i></p>

<p>Waste Heat Energy Capture from Compost for use in Agriculture / INN157</p>	<p>Objective: Net Zero Waste Abbotsford processes organic waste to produce high quality (Certified Organic) compost for the agricultural sector in the Fraser Valley Regional District (FVRD) and Lower Mainland. By capturing waste heat for use in nearby greenhouses, this project will further demonstrate that it is possible to move towards the goal of zero waste, while creating real environmental benefits and new economic opportunities. Particularly in FVRD, a region defined by agriculture, this project has the potential to lead to the development of organic waste processing facilities co-located near greenhouses, contributing to a resilient and sustainable agriculture system. This represents true cradle to cradle recycling where food waste is ultimately used to re-grow local high quality “certified organic” produce.</p> <p>Result: A waste heat capture system was developed at an existing commercial composting operation to heat water to about 45C which means that heating a greenhouse exclusively from this source is not viable. Other technologies are being explored to help the prototype system meet year round operational needs of a greenhouse.</p> <p>Impact: To be determined.</p> <p>For further information contact: Cornelia Dinca at Net Zero Waste Abbotsford Inc.</p>	<p>\$42,315</p> <p><i>complete</i></p>
<p>Used Horse Bedding and Poultry Litter Gasification Feasibility Study/ INN199</p>	<p>Objective: This project will gasify used poultry litter and horse bedding from the Fraser Valley in a European test gasification facility. Results from the test gasification will be used to assess the technical and economic feasibility of building a gasification plant at a chosen site in the Lower Mainland to convert used bedding and litter into renewable energy and ash.</p> <p><i>For more information, please contact Matthew Dickson from BC Agricultural Research & Development Corp.</i></p>	<p>\$115,500</p> <p><i>complete</i></p>
<p>Pathogen & Mold Spore Eradication in Reclaimed Animal Bedding/ INN190</p>	<p>Objective: GreenScene has developed a method of recycling waste horse bedding and reclaiming it as quality horse bedding. Three areas of concern are: to assure virtually all pathogens/mold spores are eradicated; increase, regulate and recover the heat available from the burner and to remove unhealthy fine dust. The Project is to accomplish these goals and share the results with industry, and to accelerate communication and sales of the</p>	<p>\$100,000</p> <p><i>in-progress</i></p>

	<p>product within the community.</p> <p><i>For more information, please contact Paul Cross of GreenScene AgriTek Inc.</i></p>	
<p>Demonstrate extracting animal drinking water from dairy digestate/ <i>INN236</i></p>	<p>Objective: By extracting drinking water from digestate we can reduce water consumption by up to 80%, eliminate lagoons, nutritional overload and reduce the need for acreage as herds increase.</p> <p>We wish to extract drinking water from a sample of Dissolved Air Flotation effluent at the Seabreeze digester installation in Delta. We hope to establish the working arrangements and specs needed to complete suspended solids separation and concentration of dissolved solids in reduced volume for field application with the eventual goal of adding the dissolved solids back to the manure solids for pelleting and sale off-site.</p> <p><i>For more information, please contact J. Victor Van Slyke from ATD Waste Systems Inc.</i></p>	<p>\$10,000</p> <p>complete</p>
<p>Demonstration of Microwave Technology for Sustainable Dairy Manure Management/ <i>INN241</i></p>	<p>Objective: The proposed project aims at building and demonstrating a novel microwave enhanced advanced oxidation process (MW-AOP) as part of a resource recovery system for efficient waste management of dairy industry. This would improve sustainability, nutrient management efficiency and environmental performance of dairy farms. The MW-AOP can break down solids and release nutrients from the liquid fraction of dairy manure, making the resulting solution suitable for production and recovery of struvite (magnesium ammonium phosphate; a slow release fertilizer). The breakdown of manure particulates also results in readily biodegradable products in the form of volatile fatty acids (VFAs) suitable for high-rate methane production via anaerobic digestion (AD). Using the MW-AOP treated effluent, an advanced anaerobic digester can be adopted, which can increase the rate of methane production with a smaller digester footprint; less than 1/3 that of a conventional anaerobic digester.</p> <p><i>For more information, please contact Dr. Brian Ellis from University of British Columbia</i></p>	<p>\$280,000</p> <p>on-going</p>

<p>Biogas Conditioning For Renewable Energy/ INN263</p>	<p>Objective: CHFour has devised a method whereby the H₂S would be allowed to freely travel with the biogas exiting the AD process; the gas would then be scrubbed in a tower (under the right conditions) which would drive the H₂S from a gas state to the aqueous state. Once the H₂S is in the aqueous state, it can be efficiently reacted with FeCl₃ to produce elemental sulfur and iron sulphides, which can be recovered in the nutrient stream of the AD process.</p> <p>Seabreeze is interested in deploying this innovative technology in order to improve the OPEX of our AD project as well as demonstrating that other farms can install an AD facility without disturbing their neighbours or the environment</p> <p><i>For more information, please contact Jerry Keulen from Seabreeze Farm Ltd.</i></p>	<p>\$142,280</p> <p>on-going</p>
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