



Canadian Agricultural Automation Cluster: Call for Proposals

Deadline: 5pm EST Tuesday November 14, 2017

The Initiative:

Vineland Research and Innovation Centre (Vineland) is currently developing a large-scale proposal for a **Canadian Agricultural Automation Cluster** to be funded by Agriculture and Agri-Food Canada. The goal of this cluster will be to accelerate research aimed at improving labour productivity in Canadian agriculture through automation and increased labour efficiency. Vineland is seeking outstanding research proposals to join the cluster and accomplish this goal.

Cluster goal: To improve labour productivity in Canadian agriculture

The cluster will create a critical mass of expertise to address a fundamental challenge facing Canada's agriculture sector. It will foster collaboration, create learning opportunities and promote business partnerships between all key stakeholders – growers, researchers and manufacturers – to the benefit of the sector as a whole. Research projects that address any part of the agriculture sector (e.g. livestock, dairy, poultry, field crops, horticulture and food processing) are welcome to apply.

Projects in this new cluster must encompass **pre-commercial applied research**, with products approximately 2-5 years from commercialization. Projects focused on upstream academic research are not eligible for this program nor those that are focused on final stage commercialization activities. For example, prototype development and technology adaptation research are eligible, whereas commercial scale-up activities are not.

Context: Labour challenges in Canada's agricultural sector

Cost and availability of labour are two of the biggest challenges facing Canadian agricultural producers today, and these challenges extend across all of Canada's agricultural sub-sectors. In some sectors, labour is the single highest component of production costs and labour availability can limit the growth potential for producers. These factors place significant downward pressure on the industry's profitability and threaten to negatively impact the agricultural sector's growth potential over time.

According to a Conference Board of Canada report, in 2014, despite employing 2.3 million Canadians, Canada's agriculture and agri-food sector was unable to fill 26,400 jobs, costing the sector \$1.5 billion, or 2.7% of sales. By 2025, the sector's labour gap is expected to double, putting nearly 114,000 jobs at risk of going unfilled. This is equivalent to 27% of the total demand for labour, or more than one in four jobs.

The challenges posed by Canada's shallow labour pool are compounded by rising costs for Canadian agricultural producers. The rising minimum wage, narrowing profit margins and competition from low-cost imports have significantly impacted the industry's bottom-line.

As the global market for Canadian agricultural products grows, Canada's agricultural sector must navigate a future in which a strong production outlook and growing need for labour coincides with a shrinking domestic labour pool and rising labour costs. To maintain the health of the sector, Canadian agricultural producers must develop and implement strategies that mitigate the risks posed by these realities. Improvements to labour productivity through technological innovations has been identified as one key way to address these challenges.

Meeting the challenge: Improving labour productivity in Canada's agricultural sector
Labour productivity, or the amount of goods and services produced by one hour of labour, provides a measure of labour cost per unit of production and is a key measure of economic growth potential. It is a reflection of three main factors: investment and saving in physical capital, new technology, and human capital. As an economy's labour productivity grows, it produces more goods and services for the same amount of relative work. Therefore, labour productivity, as a key measure of economic growth, will significantly impact the competitiveness and profitability of the agricultural sector.

Technological innovations that support automation and/or optimization of production and post-production agricultural practices provide an avenue for producers to improve labour productivity. Potential benefits include reduced costs, reduced risks, and efficiency gains. Although high capital costs can hinder the adoption of technological innovations, automation and optimization of agricultural practices can produce substantial cost-savings, allowing producers and other key stakeholders to realize a significant return on investment.

Numerous strategies could be used to improve labour productivity in Canada's agriculture sector. These strategies include, but are not limited to:

- Development of automation technologies
- Optimization of manufacturing, processing or packaging practices
- Development of multi-use automation technologies that can be applied to several tasks/functions (which will increase return on investment for growers)
- Development of ergonomic tools that improve labour efficiency
- Development of automated decision-support systems
- Adaptation and refinement of existing technologies to suit Canadian production systems

About Vineland

Vineland Research and Innovation Centre (Vineland) is an independent, not-for-profit Canadian organization that was created in 2007 to drive growth and impact the horticulture sector. Vineland has taken a leading role in developing automation technology strategies, processes and products for the Canadian horticulture industry, and has a team of engineers and scientists with ongoing research projects aimed at improving labour productivity in this area. For further information, please visit the Vineland website www.vinelandresearch.com

Recognizing that labour challenges extend across many areas of agriculture, Vineland is now inviting other researchers to join in their common goal of improving labour productivity throughout the broader sector. Researchers are invited to bring independent projects with their own partners and collaborators to be funded as separate activities within the cluster. It is not necessary (although it is encouraged) to collaborate with Vineland scientists, nor is the scope limited to the horticulture sector.

Vineland has a strong history of leadership under AAFC's Agricultural Innovation programs and has been encouraged to develop the current cluster proposal to address labour as a fundamental challenge facing Canadian agriculture. Previously, in partnership with the Canadian Ornamental

Horticulture Alliance (COHA), Vineland led a successful Cluster for the Ornamental horticulture sector from 2009-13 and supported COHA to build the second cluster and take on the leadership role. Vineland has also been the recipient of several large-scale Agri-Science Project grants from AAFC for work conducted in partnership with industry organizations.

Who is eligible to apply?

Eligible applicants include (a) researchers from institutions in Canada with a proven track record of success in completing research projects (b) commercial enterprises in the sector. Research activities must be carried out by one or more recognized and relevant research organizations and projects must be of a standard to be approved by scientific peer review.

The lead applicant submitting the proposal is the party with which Vineland will enter into a contract should funding be approved. The lead applicant is then responsible for managing the relationship with collaborators participating in the project, including reporting on the research that they are jointly undertaking, obtaining their expense submissions, and reimbursing them for eligible costs funded by the cluster.

Time frame for projects

The cluster program runs for five years although all work including reports and financial administration must be completed **before** the end. Therefore projects of less than five years duration are encouraged.

Earliest start date: The cluster program formally begins **April 1 2018** although delays are expected and funding approval is not likely to be confirmed until after that date. If successful, the grant will be retroactive to April 1st. If your organization does not tolerate this uncertainty, we strongly suggest that you plan for a later start date e.g. September 1st.

Latest end date: Dec 31 2022

Note that the fiscal year runs from April 1st to March 31st so project budgets and timelines should be planned accordingly.

Funding

Applicants may request funding from **\$200,000 to \$2 million** per project.

It is expected that all research applications will include matching cash investment from industry, through suppliers and/or trade associations and/or the applicant themselves. **Industry investment in cluster projects will be matched at a 2:1 ratio.** This means that applicants should secure contributions to a level of one-third (33-1/3%) of the total value of their project

- In-kind funding can be used towards the required total industry cash contribution up to a maximum of 10% of the total project costs. It is important to note that in-kind contributions must be verified and documented during the financial reporting process.
- It is anticipated that AAFC will provide a leverage ratio for the cluster as a whole at 70:30 (government:industry). The additional 3.33% will be used to cover administrative costs of the cluster.

The funding criteria may be subject to change upon the release of AAFC's official Cluster Guidelines.

The Application Process

Vineland is working within the framework of the federal program to ensure that applications are in compliance with the rules for eligible funding established by the federal government. Our goal is to make the application as user-friendly and straightforward as possible.

If you have questions or are unsure of your project's fit with this program, we encourage you to discuss this with us as early as possible. Contact us at automationcluster@vinelandresearch.com

1. Indicate your intent to apply

For planning purposes, we request that you notify us by email of your intent to apply by **Monday October 23**. Please include:

- Lead researcher name and organization
- Project title
- Agricultural sector
- Approximate funding to be requested

2. Submit a full proposal

As outlined below, please complete the application form, budget and letters of support. Submit via email to automationcluster@vinelandresearch.com by 5pm EST **Tuesday November 14, 2017**

All proposals will receive acknowledgement of receipt and those selected for inclusion in the full cluster proposal will be notified in early December. At this time researchers will be updated as to any feedback and further detail provided by AAFC and may be requested to provide additional information.

Guide to Submitting a Full Proposal

Interested researchers are requested to read the following guidelines carefully and to be sure to address all requirements when completing their full research proposals. Incomplete applications and those that do not meet all requirements will not be considered.

The submission of a full research proposal does not guarantee that the proposal will be selected by Vineland for inclusion in the final cluster submission to AAFC, nor that AAFC itself will select the proposal for funding.

A complete proposal will include the following documents, which are available on the Vineland website (www.vinelandresearch.com):

- 1. A complete research proposal submitted using the template provided.** Use the *Automation Cluster Application Form* to complete your submission. Follow the instructions provided within the body of the template as well as guidelines outlined in this document.
- 2. A complete budget using the budget template provided.** Use the *Detailed Proposal Budget* template to complete your submission. Follow the instructions provided within the body of the template as well as guidelines outlined in this document.
- 3. Support Letters.** These include letters of Acknowledgement from participating research institutions using the *Letter of Acknowledgement Template – Vineland Automation Cluster* and Letters of Commitment for all non-AAFC sources of funds using the *Support Letter Template – Vineland Automation Cluster*.

Objectives and Deliverables

Defined objectives and deliverables are essential for communicating the potential impact of a project and are particularly important for integrating within the final cluster submission to AAFC. Be sure that objectives are very **clear, concise and consistent** throughout your proposal (they should form the structure of Parts 5, 7, 8 and 9). Where there are several objectives, please indicate how they all fit together as an integrated package working toward a common goal instead of a collection of several separate sub-projects.

All research deliverables associated with project objectives (both short-term, incremental research targets, and final end-point outputs) must follow **SMART** principles. **SMART** principles, a key metric identified by both industry and AAFC, are critical for identifying progress made throughout the research project. That is, they must be:

Specific,
Measurable,
Achievable,
Relevant, and
Time-Based

When completing your full proposal, please consider the following:

- Adhere to maximum page limits indicated in the *Automation Cluster Application Form* document.
- All deliverables must be attained by the end of the project.
- Each research deliverable must be linked to a knowledge transfer action.
- We encourage collaboration in order to achieve research goals; collaboration must be coordinated and demonstrate a team-based approach.

- Applicants are encouraged to develop highly qualified personnel (HQP) and include students, postdocs etc in their project plans, especially where there are current or expected capacity gaps in a particular area of expertise.

Eligible Activities

Eligible activities include those that advance the cluster goal of improving labour productivity in Canadian agriculture and are of the following nature and type:

- Targeted applied science research and/or development activities that address sector priorities, increase market opportunities and foster innovation
- Research relating to product, practice, process and/or technology development
- Projects that pilot, test solutions and /or explore/adapt technologies
- Knowledge Transfer and the development of tailored approaches to bring science and technology from the bench to the field

See the budget section below for a list of eligible and ineligible costs.

Peer Review

Full proposals will be subjected to a scientific peer-review evaluation, as per the guidelines established by AAFC. Proposals must provide enough detail for a reviewer to understand the experimental approach to properly assess the quality of the science. Proposals should include a minimum of three and up to five nominations of potential reviewers.

Peer reviewers are defined by AAFC as scientists from industry, academia and/or government that have technical expertise in the subject matter to a degree at least equivalent to that needed for the original work. Vineland will solicit peer reviews and reserves the right to use reviewers nominated in the proposal, or other individuals, as appropriate.

Step-by-step guide to the application form

PART 1 –Applicant Information

1.1 Who is eligible to submit a proposal?

Eligible applicants include (a) researchers from academic or research institutions from Canada with a proven track record of success in completing research projects and (b) commercial enterprises in the sector. Research activities must be carried out by one or more recognized and relevant research organizations.

The party submitting the proposal is referred to as the “lead applicant”. The lead applicant accepts responsibility for achieving the deliverables of the project and for all financial obligations in relation thereto and will be the contracting party with Vineland.

1.2 Who should be listed as collaborators in this section?

The collaborators are researchers or companies carrying out key parts of the project and/or contributing funds. Their role in the project and what they bring to the project, either in terms of expertise and/or financial contribution, must be disclosed.

More than three collaborators can be included by adding additional lines to this section.

Each collaborator is also required to submit a letter of commitment signed by a senior officer of the company stating the financial commitment and making specific reference to the project.

PART 2 – Title and Area of Focus

Please provide a title for your project and indicate which agricultural sector(s) this project addresses.

Explain how your project addresses the cluster goal of improving labour productivity in Canadian Agriculture

PART 3 – Researcher Biographies

Use this section to provide a concise summary of the research team and why they are well-equipped and skilled to carry out the proposal. The biography should be a descriptive narrative, not a CV or resume.

PART 4 – Executive Summary of Project

It is essential to clearly define the project in plain language and make a concise statement of its benefits, explaining why it is appropriate that taxpayer dollars be used for the research. Be sure to identify all the parties that will gain from the research outcomes throughout the value chain.

What is the need you have identified? What is the evidence for the need? What is the solution you are putting forward to address the need? How will the solution make a positive difference to the agricultural sector and/or Canada? The more precise and specific you can articulate the objective(s) and expected outcomes, the better.

PART 5 – Project Context

AAFC has defined research as “an original investigation undertaken to acquire new knowledge” and development as “the utilization of existing knowledge to generate new applications and solutions to respond to specific needs.”

In this section, *each objective* identified in Part 4 should be addressed separately under the headings provided.

In general, proposal proponents need to clearly state how the research proposed is original or how the development will generate new applications and solutions. Describe the uniqueness, what it is replacing or improving or what gap it is filling.

PART 6A – Linkages to Past and Ongoing Projects

Use this section to indicate how this research builds on existing research.

PART 6B – Outlooks for Future Projects

Use this section to indicate what additional research could follow on from this project.

PART 6C – Other Funding Programs

All programs have strict stacking rules related to accessing funding from multiple sources. It is essential to disclose if any other program funding is being used for this project, and whether it is approved or pending. If other program funding is being used, it is essential to provide a rationale for the use of additional funding from this program and how the tracking of expenses will be done to ensure that there is appropriate segregation. Note that we expect AAFC to define a stacking limit of 75% government funds and so the cluster program is already close to that limit.

PART 7 – Detailed Experimental Approach

As noted, this section is essential to enable the scientific peer reviewers to assess the appropriateness of the research methodology and therefore must provide sufficient detail for that purpose.

PARTS 8A AND 8B – Deliverables

Deliverables are the specific outputs which you expect to achieve by the research investment within the timeline of the project. You can also think of them as “milestones” that will occur successively over the term of the project in which case you should also indicate when you expect to attain each milestone.

For Part 8A, please summarize the deliverables by each year (i.e., 2018-2019; 2019-2020; 2020-2021; 2021-2022; 2022-2023) bearing in mind that government years begin April 1. The project duration is not required to be five years. Successful projects will be required to report against the deliverables specified.

Part 8B is a summary of key deliverables for the project as a whole.

PART 9 – Knowledge Transfer Plan

Agriculture and Agri-Food Canada defines knowledge transfer as “the translation and transfer of knowledge and technology to the sector.” Knowledge transfer activities are permitted as part of the project funding and are encouraged in order to increase the adoption of innovative technologies, practices and processes aimed at improving the competitiveness and sustainability of the sector.

Explain how the knowledge gained from this project will be transferred to the sector. With whom will you share the project results, in what time-frame and in what level of detail? To what extent will the project results be used principally for the benefit of the applicant firm and collaborators and to what extent will they have benefit for the Canadian agricultural sector broadly?

PART 10 – Commercialization Plan

Use this section to explain how commercial benefit will be obtained from the research investment in the project. Be specific. Explain the steps needed to transform the results of the project to the market and how and by whom they will be undertaken after the project is completed. Discuss the barriers (capital, market acceptance, regulatory approval, etc.) to commercializing the project results and how you will overcome the barriers.

Intellectual Property Plan

Identify if this Project requires building on and/or making use of encumbered background intellectual property (i.e., intellectual property owned by or licensed to a third party); disclose any legal authority (permits, agreements, etc.) granted by said third party and/or special equipment required for its intellectual property.

Describe new (foreground) intellectual property to be developed through this Project; explain how it will be protected (patent, trade secret, plant breeders’ rights, trademark, etc.). Explain how the foreground intellectual property will be commercialized. Describe licensing requirements and strategies. If the foreground intellectual property will be owned or co-owned by the research institution, discuss the plan for licensing rights to use the intellectual property.

PART 11 – Project Duration and Budget

Please indicate the start and end dates and in which years you intend to incur costs. The cluster program begins April 1 2018 although, funding approval is not likely to be confirmed until after that date. If successful, the grant will be retroactive to April 1st. If your organization does not tolerate this level of uncertainty, we strongly suggest that you plan for a later start date e.g. September 1st.

PART 12 –Risk and Mitigation Strategies

Use this section to highlight risks that the project might be subject to and indicate how you plan to manage those risks. Risks could be financial, technical, human resource-related, marketing, etc. Ensure each risk has a corresponding mitigation strategy.

PART 13 – Peer Reviewer Recommendations

Please provide at least three recommendations of individuals qualified to assess the science who are independent of the interests of the project. Individuals nominated cannot have a conflict of interest i.e. (a) cannot be involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed; or b) cannot have collaborated with the principal investigator(s) within the last three years.

Budget

Please complete the Excel file titled "*Detailed Proposal Budget*" and submit in Excel file format (.xls or .xlsx). This form is available for download from www.vinelandresearch.com. Detailed instructions about how to complete the budget are provided within the Excel file.

Eligible costs

- Salaries/Benefits
- Contracted Services
- Travel (per diems may apply)
- Capital/Assets (limited)
- Other Direct Project Costs
- Administration

Ineligible costs

Ineligible project costs are, but not limited to, the following:

- The purchase of land or buildings;
- Alcohol, entertainment, gifts (such as gifts for speakers or facilitators);
- Minor assets and capital items;
- Normal costs of establishing a commercial operation;
- Refundable portion of the GST, value-added taxes, or other items for which a refund or rebate is receivable;
- Cost for activities intended to directly influence/lobby governments;
- Costs for activities that are deemed to be part of normal business practice for any recipient;
- Direct marketing, business promotion or one-on-one extension types of activities; and
- Other costs not specifically required for the project.

Note that the program will support limited capital expenditure. Each capital asset proposed must be separately identified and a rationale provided as to why it is required. - Detail must be provided for all proposed equipment items. Please provide rationale for any capital assets >\$5,000. Every major equipment item should appear as a separate line in the budget. Equipment purchases over \$5,000 must be pre-approved.

The eligibility of certain costs and activities may be subject to change upon the release of AAFC's official Cluster Guidelines and is ultimately at the discretion of AAFC.

When completing your budget, please note the following:

- **Fiscal years** - Fiscal years begin April 1st and end March 31st. Researchers should carefully consider their annual budget allocations as it is not possible to move funds between project years.
- **Travel** - Research-specific travel (i.e., travel to field sites for data collection) must be separated from knowledge transfer or hospitality travel (i.e., conferences, meetings).
- **Administrative Overhead** - As of the writing of this guideline, the AAFC Cluster Applicant Guide has not been released. Applicants are therefore requested to limit overhead to a maximum of 15% as per the current Growing Forward 2 framework.
- **In-kind contributions** - In-kind contribution refers to the fair market value attributed to eligible cost of goods and/or services required to complete the project that are provided by the recipient, or other project supporters (governments and/or industry supporters, partners or association members). In-kind contributions do not require a cash outlay and count towards the recipient's contribution. Verification of all in-kind and other funding must be provided. In-kind contributions are both an expenditure and a source of funds and must be included in both parts of the budget at the same amount.
- **Other funding sources** Project budgets should indicate all sources and amounts of additional funding for the proposed research, including both in-kind and cash, specifying whether each source will be applied for, has been applied for, or has been confirmed. Include only funding that is directly applicable to the proposal and do not include funding for other related projects.

Support Letters

Financial contributions from industry sources, including both in-kind and cash contributions, must be confirmed in writing. Letters to confirm financial support must be included with the application form and make specific reference to the project. They should be on company letterhead and must be signed by an authorized senior executive, include the specific dollar amount of the cash contribution and/or explicit details of in-kind contributions. A *Support Letter Template – Vineland Automation Cluster* can be downloaded from www.vinelandresearch.com.