Sustainability Projects Fund

BIG WAVE APPLICATION FORM

COVER PAGE

PROJECT INFORMATION

Please complete the fields below with information regarding your project.

Project Title Season-extension technology to meet the need for local food

Brief Description Installing a field high tunnel and a greenhouse to extend the production season of pesticide-free crops for the McGill feeding McGill project

Total Estimated Project Budget $169,073 **Amount Requested from SPF** $145,873

Campus(es) Impacted ☐ Downtown x☐ Macdonald ☐ Gault Nature Reserve ☐ Other

CONTACT INFORMATION

Project Leader

This person must be a current McGill University student, administrative staff, or academic staff.

Name	Mike Bleho	Affiliation	Choose one.
Phone	514 712 2776	Faculty/Unit/Organization	Mac farm
Email	Michael.bleho@mcgill.ca	Campus	Macdonald

Project Team Members

The SPF encourages you to be inclusive, collaborative (especially between staff and students), diverse, and interdisciplinary when possible. To list more members, please complete a second cover page. You may e-mail it to SPF Staff to include with your application.

Name	David Wees	Affiliation	Academic staff
Email	David.wees@mcgill.ca	Faculty/Unit/Organization	FAES, FMT Program
Name	Oliver De Volpi	Affiliation	Administrative staff
Email	oliver.devolpi@mcgill.ca	Faculty/Unit/Organization	SHHS
Name	Mark Lefsrud	Affiliation	Academic staff
Email	mark.lefsrud@mcgill.ca	Faculty/Unit/Organization	FAES
Name	Gail MacInnis	Affiliation	Student
Email	gail.macinnis@mail.mcgill.ca	Faculty/Unit/Organization	Alumnus
Name		Affiliation	Choose one.
Email		Faculty/Unit/Organization	

SUBMISSION INFORMATION

In line with the SPF Eligibility Criteria, our team certifies that this project takes place at McGill University, is sustainability focused, is requesting seed funding, and is action oriented. x☐ Yes ☐ No

Our team has read the SPF Terms & Conditions and agrees to respect them. x☐ Yes ☐ No

Our team understands that this application is not confidential and consents to have its contents shared with relevant stakeholders during the review process and, if approved, on the SPF website. x☐ Yes ☐ No

Our team agrees to have their contact information included in the complete and shared application. x☐ Yes ☐ No

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PROJECT OVERVIEW

Instructions: *Please answer the questions below as clearly and concisely as possible. You will be able to detail your project further in Part 2 of the Over $5,000 application process, the Project Plan, as well as submit relevant appendices. Once you have completed this Project Overview, save it and submit it online. SPF Staff will respond with feedback on your application within 2 weeks and send you Part 2. Once all sections are complete, the combined application will be provided to the SPF Governance Council for their review and decision. As a reminder, all SPF applications are assessed using the SPF Eligibility & Evaluation Criteria:*

ELIGIBILITY CRITERIA		EVALUATION CRITERIA		
AT MCGILL	**SUSTAINABILITY FOCUSED**	**ANALYSIS**	**IMPACT**	**FEASIBILITY**
SEED FUNDING	**ACTION ORIENTED**	**COLLABORATION**	**SUPPORT**	**CAPACITY BUILDING**

Before starting, you may find it helpful to consult the SPF Sustainability Brief and Vision 2020 Climate & Sustainability Action Plan.

CONTEXT

Criteria assessed in this section: **SUSTAINABILITY FOCUSED, ANALYSIS**

1. **What specific sustainability-related need/issue have you identified at McGill and aim to address through your project? In your response, please describe clearly how the need/issue is related to sustainability.**
   Limit ~200 Words

Over the past 10 years Macdonald Campus's Hort Center and McGill's Food and Dining services (now SHHS) have built a successful and symbiotic relationship that has resulted in the production of 25,000kg of fruits and vegetables annually being transformed into 10,000 meals per day in our various McGill cafeterias.
This practice has increased McGill's local food sourcing, reducing its carbon footprint and contributed to a circular local economy that allows its farms to stay viable while offering employment to students and providing services and research opportunities to students and staff.
In this time of global uncertainty, access to local food could become critical.

2. **How do you know this is a need/issue? What research have you done (e.g. consultation, observation, survey)? If you received funding for project planning, please include the key results here and attach an appendix, if needed.**
   Limit ~400 Words

McGill's SHHS has identified local sourcing of a large portion of its food needs as a sustainability objective, this project meets that need. Over the past 10 years we have heard from countless students who appreciate the fact that the food they eat in our cafeterias is grown at McGill farms in a sustainable way (less to no pesticide use and reduced fertilizer use). The project presently pays out roughly 5,000 hours of wages to our students during production and harvesting periods helping our students meet their financial needs.
Our project meets some of the objectives of McGill's vision 2020.

3. **Is there an underlying systemic issue or need? Are there other areas of McGill experiencing the same issue? If so, is there an opportunity to collaborate or address the root cause/need?** *Limit ~200 Words*

There is an underlying systemic need for a local, sustainable and high quality food supply at McGill and our project works towards meeting this need, much of the food produced by this project will be consumed by McGill students and staff at various outlets across the University. We are open to supplying any food retailer on any of the McGill Campuses.

4. **What relevant information and/or best practices have you found that relate to this need/issue? Please include a benchmarking analysis of relevant external organizations, which could include McGill's peer institutions. You may attach an appendix, if needed.** *Limit ~200 Words*

Other institutions in Canada and the United states follow a similar model to our McGill feeding McGill model such as UBC's Center for Sustainable Food Systems and Guelph's Urban organic farm (a 1 ha farm) and in the US the Universities of Vermont, Maine and Virginia tech to name a few. We can use these other farm projects as comparables to our own performance, this could make for an interesting student project in the future.

5. **Detail any relevant related initiatives (past or current) that you are aware of at McGill.** *Limit ~200 Words*

There are other organizations at McGill that produce food ie: MSEG,etc.. but their aims are for retail sales and small production amounts to customers at McGill and outside of McGill.

6. **What expertise or qualifications does your team have regarding this need/issue? Please note, teams should be interdisciplinary and collaborative.** *Limit ~200 Words*

Our multi-disciplinary team is made up of Horticulture technical and academic (teaching and research) people, agricultural engineers, student researchers and the chefs at McGill. The team has all the expertise to plan, build, grow, harvest, cook, teach and research.

PROJECT IDEA

Criteria assessed in this section: **ALL ELIGIBILITY & EVALUATION CRITERIA**

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7. What is your project idea? In your response, please describe how the idea will help contribute to sustainability at McGill. *Limit ~600 Words*

McGill feeding McGill" is a very sucessfull partnership between the Macdonald Campus Farm and McGill's Food and Dining Services (now SHHS). However, the crop production season is fairly short even though the demand for fresh vegetables is at a peak from September through April. In the Fall semester, as daylength shortens and weather becomes cooler, vegetable yields decline. We typically get killing frosts in mid October. These frosts essentially stop all production of tomatoes, peppers, eggplants, cucumbers and other crops that are used abundantly in McGill's cafeterias. This project proposes to build two new structures at the Horticultural Research Center on the Macdonald Campus to improve our food production capacity in terms of quantity, quality and seasonality.

The first part of this proposal is the construction of a low-input "high tunnel" which would enable us to increase our pesticide-free vegetable production capacity for the McGill feeding McGill project. High tunnels are unheated, plastic-covered structures that provide protection from rain and hail, reduce the incidence of certain fungal diseases that are destructive to crops and create a very favourable growing environment for crops by increasing soil and air temperatures. High tunnels can also protect sensitive crops (like tomatoes) from light frosts, both at the begining and end of the growing season thus allowing us to produce for a longer time. We are trying to eliminate the use of pesticides at the Horticultural Center of Mac Farm and growing under tunnels is another tool we can use to achieve this. Field-grown vegetables are suceptible to a range of fungal and bacterial diseases. Growers frequently spray pesticides to control these diseaseas. Growing vegetables under a high tunnel reduces the need to spray.

As the second part of this project, we are proposing the instalation of a low-input greenhouse to grow crops from October to December and again early in the spring (March-May) under heated conditions. This greenhouse would also be used as a place to properly "cure" fall squashes, sweet potatoes as well as dry garlic (in the early fall); "curing" is needed to prolong storage life of certain vegetables and thus be able to supply "McGill feeding McGill" with certain vegetables into the winter semester.

The proposed project addresses issues of food security in a changing climate, reduction of environmental impacts of food production as well as the education of students, staff and the general public.

8. Is your project related to the University's Vision 2020 Sustainability Strategy? x ☐ Yes ☐ No ☐ Not sure

9. If you answered yes to Question 6, how does it relate? Please refer to the strategy in your response. *Limit ~200 Words*

The project relates to many of the catagories of McGill's vision 2020, most specifically operations (food, water, land), connectivity (wellness+health, community engagement), education (experiential learning) and research (inter disciplinary, ecological footprint).

TRANSFORMING CAMPUS

Criteria assessed in this section: **AT MCGILL, IMPACT**

10. What will be the primary impact of your project? *Note: Big Wave projects should have a significant impact on the McGill community and/or operations. Limit ~200 Words*

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The major major impact will be the increase in out-of-season food production capacity for our McGill feeding McGill project whose mandate is to provide good quality, locally produced food for our cafeterias on the downtown Campus. The second major impact would be to enable us to increase our food production capacity despite a rapidly changing climate in these uncertain times. The third impact of the project on life at the University will be the move towards a more sustainable food production system with less pesticides at the Mac Campus farms.

11. In the table below, indicate your proposed project's 5 main impacts on the McGill campus community or goals to accomplish. Please check the stakeholders that will be impacted. Finally, please list at least one key success indicator for each impact (e.g. # people will be engaged in the project, % waste will be diverted from the landfill, # buildings will be LEED certified, etc.)

	Main Impacts/Goals	McGill Stakeholders Impacted (check all that apply)	Key Success Indicator(s)
1	More sustainable food production using less pesticides	x☐ Undergraduate x☐ Academic Staff x☐ Postgraduate x☐ Admin. Staff	Monitor pesticide usage
2	Increasing out of season production	x☐ Undergraduate x☐ Academic Staff x☐ Postgraduate x☐ Admin. Staff	out of season delivereables eg: after mid October
3	Maintaining consistent food production despite changing climate	x☐ Undergraduate x☐ Academic Staff x☐ Postgraduate x☐ Admin. Staff	quantities produced and delivered to our partners at SHHS
4	teaching students and the general public about out of season food production	x☐ Undergraduate x☐ Academic Staff x☐ Postgraduate x☐ Admin. Staff	Numbers of students, classes and visitors
5	increasing research opportunities for students and staff eg: sustainability of winter vegetable production	x☐ Undergraduate x☐ Academic Staff x☐ Postgraduate ☐ Admin. Staff	Numbers of researchers and projects

12. Have you considered implementing your project at more than one McGill campus? (e.g. If your project is downtown, could it be implemented at Macdonald Campus as well?)

☐ Yes x☐ No

13. Please describe your choice(s) of campus(es) and why this decision is best for your project. *Limit ~200 Words*

These structures will complement the existing structures already in place at the Macdonald Campus Hort center, it wouldn't make much sense to split the operation and the downtown Campus (to my knowledge) doesn't have the land or the infra structure that is needed to put these installations in place.

IMPLEMENTATION

Criteria assessed in this section: **ACTION ORIENTED, FEASIBILITY, IMPACT**

14. List the key activities for your project and indicate the timing for these on the right. Please be specific and realistic when formulating your activities, ensuring that they are achievable within the indicated timeframe.

Key Project Activities	Start Date (MM-DD-YY)	End Date (MM-DD-YY)
planning the project	1-1-	2-1-20

project application	2-1-20	3-20-20
ordering the structures	5-05-20	5-10-20
land preparation for new tunnel	6-01-20	6-05-20
installation of new tunnel	6-20-20	7-10-20
transplanting into new tunnel	7-01-20	7-10-20
maintaining plants in tunnels (staking, tying, pruning)	7-10-20	8-28-20
preparing site for new greenhouse	6-01-20	8-01-20
installing new greenhouse	8-01-20	8-28-20
ordering greenhouse supplies (lights, water systems, gravel, accessories)	7-1-20	9-1-20
setting up the new greenhouse	8-1-20	9-15-20
harvesting in tunnel	9-01-20	11-1-20
starting plants for new greenhouse	8-15-20	9-01-20
transplanting in new greenhouse, maintaining plants	9-15-20	10-01-
harvesting in new greenhouse	11-01-20	12-15-
shutting down new greenhouse	12-20-20	
restarting new greenhouse	2-28-21	
starting plants, transplanting, maintaining new planting	2-15-21	
harvesting spring crops	3-15-21	5-1-21
report writing	9-15-20	10-15-
final report	5-1-21	6-1-21

15. Please describe what will happen to your project after the SPF funding ends. Additionally, please share if anything will be produced or installed. (e.g. a workshop guide, equipment, a toolkit, a network, website, etc.) If so, please describe these items and indicate how they will be maintained. *Limit ~400 Words*

The SPF funding will enable us to buy the structures and accessories needed to grow crops in them and to finance student labor to set up and erect the structures. Once we start using the structures for crop production, Mac Farm operating budget will finance the work of growing and harvesting these crops (student labor) and related expenses including transportation from our farm to McGill downtown. In subsequent years Mac Farm operating budgets will finance the complete operation of growing, harvesting, repairing these structures.

16. In the table below, please list the main risks associated with your project and the measures you will take to reduce their likelihood.

Main Risks	Preventative Measures
violent weather that could damage the structures including rain, wind, snow	The tunnel will be located behind windbreaks located on the west, north and south sides.
extreme cold weather could make heating the greenhouse difficult	insulating the lower 2-3 ft of the greenhouse perimeter
pest and disease problems	monitoring and using biological controls (non toxic)

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STAKEHOLDER ENGAGEMENT

Criteria assessed in this section: **AT MCGILL, COLLABORATION, SUPPORT, CAPACITY BUILDING**

17. **Please list all of the key stakeholders involved in your project, indicating their role and support. If the stakeholder has provided a support letter, please indicate so here and attach it as an appendix document. Include the 3 stakeholders listed in your pre-application form.** *Note: Projects involving modifying a space on campus, making a permanent installation, hiring a full-time staff, or adding/modifying a garden, etc., must seek permission from the appropriate stakeholder(s) (e.g. building director, Campus Planning and Development office, staff supervisor, etc.).*

Stakeholder's Name	Title	Role in the Project	Support/ Permission	Support Letter
Paul Meldrum	Mac Farm manager	administration of farm activities	yes	Choose one.
Oliver De Volpi	Executive chef McGill	Planning crops and purchasing	yes	Yes
Anja Geitman	Dean FAES Macdonald	Outreach and promotion	yes	yes
David Wees	Prof. FMT program	Coordinating educational activities	yes	Choose one.
Happy Belly	Student food group	Beneficiary of food	Yes	yes
MCSS	Student administration	Student representatives	Yes	yes
Gail McInnis	Alumnus & researcher	Advice on native pollinators	yes	Choose one.
			Choose one.	Choose one.
			Choose one.	Choose one.
			Choose one.	Choose one.

18. **Please provide communications plan for your project. Include how you will share its impacts with your stakeholders and the McGill community and promote visibility. Tactics (e.g. social media, workshops, tabling, newsletters, etc.) and any related timing (e.g. at the beginning, during, or after the project) should be detailed as well. You may attach an appendix, if needed.** *Limit ~400 Words*

The whole process from installation to harvest will be documented by photos and video. Educational tours s will be provided throughout the season. Relevant media will be contacted.

19. **Please list the training, volunteer opportunities, jobs, or complementary applied student research integrated in your project. Please describe.** *Limit ~200 Words*

The tunnel and greenhouse will provide multiple opportunities for student harvesting jobs throughout most of the academic year, to give an example the tunnel will have roughly 1000 tomato plants and each plant bearing fruit from Mid- August to early November, the greenhouse will be in production from October to May with a break during the coldest months. The farm hosts several student stagieres for weeks during the season. Our tunnels serve as templates for many students submitting final projects in the FMT program, the students in the Horticulture option of the FMT program spend much of their class time on the farm learning about all aspects of crop production (growing in tunnels and greenhouses is a part of this), various classes visit the farm notably cropping systems (PLNT300) to look at growing systems such as these. These structures are well designed especially for senior undergrad research projects ie: monitoring climate in unheated structures. John Abbott CEGEP's Humanities dept has a course entitled " Sustainable Living: practical skills for lifelong learning" that bring hundreds of students to visit and do a few hours of light work on the farm each fall to name but a few. We give tours of the farm to various groups such as : JAC, Dawson College, Universite de Montreal etc..

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PROJECT BUDGET

Criteria assessed in this section: **FEASIBILITY**

Revenues

Indicate any funding you will receive or may receive to complete your project, including funds from McGill Departments and Units. You are strongly encourage to list at least one other funding source. ***If your project will involve cost savings or revenue generation, please attach an additional financial model in an appendix.***

Funding Source(s)	Amount Requested	Request Status
Sustainability Projects Fund (SPF)	$145,873.4	Requested
Mac Farm budgets	$21,700	confirmed
FMT budgets	$1,500	confirmed
	$0.00	Choose one.
REVENUES GRAND TOTAL *(must match Expenses Grand Total))*	**$ 169,073.40**	

Expenses

Indicate your project expenses below.

Item Description	Unit Cost	# of Units	Total Cost	Expense paid by SPF?
Field tunnel materials	$ 31,000	1	$ 31,000	yes
Greenhouse materials	$ 14,000	1	$ 14,000	yes
setup tech from Harnois time and expenses per week	$ 3,200	3	$ 9,600	yes
water and electrical hookup for greenhouse	$7,000	1	$7,000	yes
water filtration system for captured rainwater use in greenhouse	$2,000	1	$2,000	yes
LED lighting system for greenhouse	$10,000	1	$10,000	yes
site preparation, concrete and gravel for greenhouse set up	$10,000	1	$10,000	yes
benches, geotextile, irrigation system, growing medium, seeds, tools for	$15,000	1	$15,000	yes
data acquisition system for greenhouse	$2000	1	$2000	yes
hydraulic excavator for digging in posts	$75	25	$1875	yes
greenhouse ventilation equipment	$5,000	1	$ 5,000	yes
thermal screen (energy conservation)	$5,000	1	$ 5,000	yes
in kind contribution from Mac Farm (salaries, machinery and tractor use)	$21,700	1	$21,700	no
misc specialized equipment for greenhouse and tunnel (FMT contribution)	$1500		$ 1500.00	no
	$0.00		$ 0.00	Choose one.
	$0.00		$ 0.00	Choose one.
	$0.00		$ 0.00	Choose one.
		Expenses Subtotal	**$ 135,675**	

Salaries & Wages

If applicable, please indicate any paid positions needed for your project. Please note: if you complete the Salaries & Wages section, you must also complete the Staff Position Information Appendix.

Position Title	~# Hours per Week	~# Weeks	Hourly Wage	Subtotal	+ 20% Benefits	Total Cost	Expense paid by SPF?
Field operations assistant	35	13	14	6370	1.2	7644	yes
Field operations assistant	35	13	14	6370	1.2	7644	yes
Field operations assistant	35	13	14	6370	1.2	7644	yes
Field operations assistant	35	13	14	6370	1.2	7644	yes
Field operations assistant	14	12	14	2352	1.2	2822.4	yes
					Salaries & Wages Subtotal	**$ 33398.4**	yes

EXPENSES GRAND TOTAL *(must match Revenues Grand Total)*	**$169,073.4**

APPENDIX

Relevant Support Documents

List any appendix documents in order in the table, below.

Please keep the total number of pages as low as possible. Please include any required and other relevant support letters.

Doc #	Appendix Document Title	# of Pages
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14	Financial model, if project has a cost savings or revenue generation component	
15	Staff Position Information Appendix, if applicable	