

# Greening Indoor McGill

## I. Pilot Project Summary

This 15-month project proposes to use indoor plants to improve air quality and promote a healthy aesthetic through the greening of indoor environments for McGill faculty, staff, and students. It will consolidate and support linkages between McGill staff, Department of Plant Science faculty and Plant Science undergraduate students, as a means of supplying both plants and associated expertise to McGill faculty, staff and students. This pilot project is proposed for February 2012 to April 30<sup>th</sup> 2013. Through collaboration of Plant Science Professors Danielle Donnelly and David Wees and McGill staff member Dr. Heidi Hoernig, the pilot incorporates student projects from three Plant Science courses: PLNT 310 Plant Propagation (W2012), FMTP 006 Agricultural Botany (F2012) and PLNT 312 Urban Horticulture (W 2012) to: 1) Propagate and distribute suitable indoor plants for office environments at McGill University; 2) hold workshops to disseminate information on the propagation and care of plants; 3) Develop a website that can be used as a resource to further green McGill indoor environments; 4) Conduct follow-up survey to provide additional information on plant care and maintenance. Our request to the Sustainability Project fund (\$3,000) is for start-up money for the first round of projects. We anticipate that through future funds generated through the project's activities will maintain its financial sustainability. In-kind faculty, staff, and student time will contribute significantly to this project.

## 2. Pilot Project Rationale

***Rationale: Greening Indoor McGill environments has positive health value but barriers exist.***

***Indoor environments at McGill:*** McGill faculty, staff, and students spend much of their time in indoor environments; therefore, these locations should provide healthy conditions for productive work and study. In recent decades with the advent of more air-tight, energy-efficient buildings, various concerns regarding indoor air pollutants, particularly volatile organic compounds (VOCs) like formaldehyde, benzene and toluene from a variety of sources (furnishings, office equipment, paints etc.), have brought the question of indoor air quality to the forefront of indoor environment and health issues. Sedentary, urban worklives and lifestyles comprised of extended periods of time in indoor environments also means that many people, including McGill faculty, staff and students, spend a significant proportion of their daily lives distanced from natural environments.

***What can foliage plants contribute?:*** Numerous studies have demonstrated that foliage plants can play an important role in mitigating indoor air pollution, including absorbing CO<sub>2</sub> and some volatile organic compounds (VOCs) as well as improve air humidity in heated buildings. Research also indicates numerous psychological and aesthetic advantages to a green indoor environment and close proximity to indoor plants. (See IV. Additional Information for sample of references documenting these benefits)

***What are the barriers to establishing greener offices?*** Several barriers prevent the establishment of a robust, indoor plant environment at McGill University. First, there are insufficient institutional financial resources to supply and care for plants in all McGill offices and activity space. This can be remedied by individual McGill faculty, staff and students being responsible for their own plants in their offices and activity spaces. Indeed, some already do follow this practice. However, as evidenced by a quick visual survey of McGill indoor environments, many do not, for a variety of reasons. These reasons constitute the second set of barriers: lack of knowledge regarding what plants suit particular office conditions (e.g. low natural or artificial light conditions; infrequent watering) and how to propagate and care for plants (e.g. fear of killing the plant). Readily available information on plant care and propagation, as well as a base source of appropriate indoor foliage plants (which can be further and cheaply propagated) are two important and very cost-effective means of greening of indoor McGill.

### 3. Pilot Project Goal, Objectives & Activities

**Goal:** to promote high-quality, healthy, and green indoor work and study environments across McGill University through the establishment of indoor plants. This pilot project is the first step. This pilot project leverages students and faculty to provide indoor plants and plant know-how to McGill faculty and staff for office spaces. Through this pilot, we will establish a base through which to explore a wider initiative to establish and maintain indoor green environments throughout McGill, including not only offices, but also activity spaces like cafeterias, libraries, hallways, and classrooms.

**Objectives:** To produce and distribute approximately at least 200 indoor plants, and provide information on their care to McGill office staff through a collaboration with undergraduate course project students in PLNT 310 Plant Propagation (Winter 2012), Agricultural Botany FMTP 006 (Fall 2012) and Urban Horticulture PLNT 312 (Winter 2013) their professors Dr. Danielle Donnelly and Mr. David Wees, Plant Science Dept. and staff member Dr. Heidi Hoernig (and others).

**Activities:** **PLNT 310 Plant Propagation Winter 2012:** 1) Identification of suitable plants for office spaces (through discussion with McGill staff) 2) Library retrieval of propagation and maintenance information for each plant 3) Purchase of source plants for extensive cutting production and containers for final product 4) Experimental work involving propagation of each plant as guided by the literature 5) Potting-up of rooted cuttings into suitable containers. **FMTP 006 Agricultural Botany Fall 2012:** Student-involved production and distribution of poinsettias for Christmas 2012. **PLNT 312 Urban Horticulture Winter 2012:** Follow-up survey by student through student projects, of Greening Indoor McGill participants regarding success, satisfaction and challenges of use/maintenance of indoor plants **Workshops:** Hosting of two workshops to distribute plants, information and support materials on plant care. **Website:** 1) Exploration of different website formats to present information; 2) confirm permanent site for a **Greening Indoor McGill** website (currently exploring several options); 3) Integration of information from PLNT 310 Plant Propagation final reports & PLNT 312 Urban Horticulture survey to address identified issues by students and staff.

### 4. Project Implementation

#### A. Tasks and Responsibilities

Type of Activity – Task	Time Required	Group Member in Charge
PLNT 310 Plant Propagation : student research projects	Jan – April 2012	Danielle Donnelly
Workshop 1: Healthy Living with Plants - downtown	April 20 <sup>th</sup> 2012	Heidi Hoernig & Anne Clark
Workshop 2: Propagation & care of indoor plants Macdonald	April 2012	Heidi Hoernig
Website launch	End of April 2012	Heidi Hoernig
FMTP 006 Agricultural Botany : poinsettia projects	Fall 2012	David Wees
Ongoing updating of website	Apr 2012-2013	Heidi Hoernig
PLNT 312 Urban Horticulture: Follow-up survey projects	Winter 2013	David Wees & Heidi Hoernig

#### B. Pilot Project Timeframe/Milestones

**February 15, 2012:** each project group submits literature review and proposal; & propagation research activities begin; **Week of April 9<sup>th</sup>:** propagation research complete; final reports and oral presentations **Mid-April:** Workshop 1: “Boost Your Health” workshop: *Healthy Living with Plants* (downtown campus); Workshop 2: *Propagation and care of indoor plants for offices*, (Macdonald campus). Plants and plant care information distributed at these workshops. **February – May 2012** Information from the final reports and workshops will form the basis for a website that will serve both to disseminate information and continue the process of office greening in a sustainable manner. **September-December 2012:** FMTP 006 Production and distribution of poinsettias for Christmas 2012; **January –April 2013:** PLNT 312:

Follow-up survey including an analysis of participants' reactions to increased indoor greening (degree of satisfaction, indoor work space quality, etc.) as well as degree of success of the chosen plants (species, size, type of containers, etc.): this will 1) create a database of knowledge for future participants so as not to repeat the mistakes of the past; 2) also lead to additional information to website and 3) contribute to planning of next phases of Greening Indoor McGill towards greening other indoor environments.

### C. Project Deliverables and Outcomes

**Project Deliverables.** Four-to-six species of indoor plants, approx. 40 plants each (total 160-240) with final distribution of 75-100 indoor plants will be propagated and distributed among McGill faculty and staff for their offices in April and 75-100 Poinsettias for Christmas 2012; Two workshops: one downtown McGill campus and a second at the Macdonald campus will be used to distribute plants and describe propagation and care information to office workers interested in obtaining plants. A project website to be maintained by Dr. Heidi Hoernig (participation of students anticipated in this task e.g. from Urban Horticulture PLNT 312)

**Project Outcomes:** 1) Beginning of the process of greening McGill indoor environments; the long-range plan is to green indoor work, study and activity spaces across McGill campuses; 2) Important linkage between McGill staff, knowledgeable Plant Science Dept. Faculty and students; 3) Important and concrete contribution of undergraduate students to greening their university; 4) Increased institutional knowledge on advantages of indoor plants and plant care; 4) Increased information on indoor plant benefits and care available to McGill faculty, staff and students; 5) Improvement of quality-of-work-life for McGill faculty and staff; 6) Concrete contribution to McGill's culture of sustainability

### D. Eligibility:

This pilot project is eligible for the SPF and meets its criteria in the following ways: **1)** It promotes and facilitates **applied student research projects**; the added advantage of this project is that by connecting student plant propagation projects to known recipients, their projects are more meaningful and rooted in real world environments rather than imagined ones; **2)** It promotes and facilitates **engagement of and collaboration among staff, faculty and students**; b It will result in **predictable, measurable outcomes** (see below); **4)** It actively **promotes and advances a culture of sustainability** by addressing and affecting the routine activities (via indoor plant care) and the individual indoor work/study environments of faculty, staff and students. In particular, it helps facilitate individuals to directly make small but concrete and significant contributions to green and improve McGill's indoor environment. **5)** Most of the goods and services involved in this project are developed by McGill students and faculty, and are therefore, **local**. **6)** Indoor plants for individual offices and other activity spaces are **not funded by any existing McGill university entity** nor are they eligible for research grant funding. Available course funds only cover materials for small student projects. They do not allow for large quantities of plants to be propagated for distribution or for the provision of suitable containers. N.B. A unique feature of the project is its collaboration between McGill's downtown and Macdonald campuses.

### E. Project Team members and stakeholders

**Team members:** Professors Danielle Donnelly and David Wees, McGill Department of Plant Science, will provide in-kind donation of time and expertise; Staff member, Heidi Hoernig, Research Services, Faculty of Arts, will provide in-kind donation of time to the project; **Other stakeholders.** Human Resources - Anne Clark; in-kind support co-ordinating session for Boost your Health Lunch hour series; (see letter of support). Plant Science Department - green house and resources (see letter of support). McGill faculty and staff will receive plants & information. Numerous *ad hoc* conversations with a variety of McGill faculty and staff in several of the Faculty of Arts buildings over the past year has demonstrated that there is a great deal of interest in both indoor plants and information.

**F. Budget - Detailed expenses**

Expense Description	Cost
<b>N.B. These expenses are in addition to those covered by the course fees for those plants above and beyond regular student projects, to provide plants for office staff</b>	Estimate
Purchase of plants of several species suitable for taking extensive cuttings from for experimental propagation activities.	<b>\$800</b>
Rental of greenhouse bench space for plant growth (1 bench at \$10.00 per day for 90 days)	<b>\$900</b>
Potting mixtures, fertilizers, flats, humidity domes, pots, for propagation; ornamental wood supports and stones, large ceramic containers for office use.	<b>\$1,000</b>
Workshop at Macdonald Campus to communicate written and oral information to McGill community of office workers (materials and refreshments for 50 participants)	<b>\$100</b>
Transport plants (Macdonald-downtown). Mileage cost: 61 km x \$0.55 x 6 trips	<b>\$200</b>
<b>Total</b>	<b>\$3,000</b>

**Critical Date: Financing required by Feb 15, 2012 for plant purchases below**

**G. Anticipated revenue and long-term sustainability**

McGill office staff participating in the pilot project may be asked to contribute towards the plants and container. Subject to the results of the plant propagation student research projects, a fee of upwards of \$10 each could be charged for each containerized specimen plant. Given past experience with students' projects, it is estimated that about 75-100 plants from each of the courses PLNT 310 Plant Propagation (W2012) and FMTP 006 Agricultural Botany (F2012) would be suitable for sale, with an approximate revenue of \$1500-\$2000, that would offset the cost of maintaining the source plants for use as a resource in future years and be put towards materials and supplies for the subsequent propagation courses that will include student projects for Greening Indoor McGill (2013 & 2014), thereby eliminating the dependency of this project on future funding.

**5. Additional information on key participants.** **Dr. Danielle Donnelly** is an Associate Professor, long-time member of the Plant Science Department and an experienced teacher and propagator familiar with plant species common in temperate indoor plantings with extensive experience guiding undergraduate group project work. She will liaise with Dr. Hoernig and others with an interest in greening their offices, guide project students in propagation activities, assist with workshop planning, and help to facilitate the process of greening indoor McGill. **Mr. David Wees** is a Faculty Lecturer in the Plant Science Dept. and Farm Management and Technology Program FMT program. He is also an experienced teacher and propagator familiar with plant species common in indoor plantings. He too has worked extensively with student project groups. David will liaise with Drs. Hoernig and Donnelly as well as others interested in greening their offices, assist with workshop planning, and help to promote the concept of greening indoor McGill. **Dr. Heidi Hoernig** is an indoor plant enthusiast with an established interest in greening her office and assisting others to do the same. She has taken a leadership role in promoting the idea of greening indoor McGill and will be instrumental to the success of this pilot program. Heidi will liaise with Dr. Donnelly of the Plant Science Department and her students, will assist with workshop planning, and will establish a website to promote the concept and facilitate the process of greening indoor McGill.

**Letters of support:****See below letter of support from:**

1. Anne Clark, Human Resources; 2. Philippe Seguin – Chair, Plant Science Department.

### **Representative sample of research on benefits of indoor plants**

There is a large body of research on the health, psychological and various other benefits of indoor plants. The following is a representative sample of research documenting these benefits.

Burchett, Margaret, Fraser Torpy, Jason Brennan and Ashley Craig. (2010). Greening the great indoors for human health and wellbeing. Final Report to Horticulture Australia Ltd. [http://www.nipa.asn.au/uts\\_project.htm](http://www.nipa.asn.au/uts_project.htm)

Fjeld, Tove, Bo Veiersted, Leiv Sandvik, Geir Riise and Finn Levy. (1998). The effect of indoor foliage plants on health and discomfort symptoms among office workers. Indoor and Built Environment. 7: 204.

Han, Ke-Tsung. (2009). Influence of limitedly visible leafy indoor plants on the psychology, behavior, and health of students at a junior high school in Taiwan. Environment and Behavior 2009 41: 658

Kaplan, Rachel (1992) The psychological benefits of nearby nature. In D. Relf (Ed.) The role of horticulture in human well-being and social development. Portland, OR: Timber Press. (Pp. 125-133.)

Kaplan, Rachel (1993/10). The role of nature in the context of the workplace. Landscape and Urban Planning 26(1-4): 193-201.

Lohr, V.I., C.H. Pearson-Mims, and G.K. Goodwin. (1996). Interior plants may improve worker productivity and reduce stress in a windowless environment. Journal of Environmental Horticulture 14(2):97-100.

Raanaas, Ruth, Katinka Horgen Evensen, Debra Rich, Gunn Sjøstrøm, and Grete Patil. (2011). Benefits of indoor plants on attention capacity in an office setting. Journal of Environmental Psychology. 31: 99-105.

Shibata, S. & Suzuki, N. (2004). Effects of an indoor plant on creative task performance and mood. Scandinavian Journal of Psychology, 45, 373 –381.

Wood, Ronald, Margaret Burchett, Ralph Alquezar, Ralph Orwell, Jane Tarran and Fraser Torpy. (2006). The potted-plant microcosm substantially reduces indoor air VOC pollution: 1. Office Field-Study. Water, Air and Soil Pollution. 175: 163-180.



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January 17, 2012

**Dear Members of the Sustainability Projects Fund Committee:**

As Chair of the Plant Science Department, I support the joint application of Drs. Heidi Hoernig and Danielle Donnelly for a Pilot Project on Greening McGill Offices. I can see the value of encouraging undergraduate student projects that promote the aesthetics and health of McGill office workers. The pilot project proposed for this year, where undergraduate students in PLNT 310 Plant Propagation work with their instructor and interested McGill staff including Heidi Heinrig, has merit and should be supported. All participants will clearly benefit from this activity which could have a long-term positive impact.

This pilot project can set the stage for continued similar activities with other Plant Science faculty and their students, in future years. I agree that 1 bench in the Greenhouse can be rented to support plants purchased for project work and propagules destined for McGill University Offices this year. If all goes well, I will have no hesitation in the continued support of the department in related projects for "greening" the McGill indoor environment.

In summary, I wholeheartedly support this application and agree to the participation of Dr. Donnelly and her students, as well as greenhouse staff, in this pilot project.

Sincerely,

A handwritten signature in blue ink, appearing to read "Philippe Seguin".

Dr. Philippe Seguin  
Chair, Plant Science Department



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To the Sustainability Projects Fund Working Group

January 25, 2012

Re: The application from Greening Indoor McGill

Dear Sir/Madam,

I have been asked to provide some information concerning the *Greening Indoor McGill* application to the Sustainability Projects Fund, submitted by Dr. Heidi Hoernig (Research Services, Faculty of Arts) and Dr. Danielle Donnelly (Plant Science).

I currently coordinate a series of events which is presented by Health & Wellbeing, Human Resources, McGill University. I can confirm that, mid to late April, Drs. Hoernig and Donnelly have been booked to contribute a noon-hour session entitled "Healthy Living with Plants" in our lunch-hour "Boost Your Health" series for McGill Faculty and Staff.

This series of lunchtime events focuses on healthy living through prevention, eating right, exercise and stress reduction. It is designed to provide inspiration to McGill staff members regarding their health and wellbeing from a variety of different sources from within the McGill community. Please see our current programming at <http://www.mcgill.ca/hr/employee/health-wellbeing/boost-your-health-2012>. Our office is very pleased to include this important topic in our repertoire of health and well-being promotional activities for McGill Faculty & Staff.

If you have any questions, please do not hesitate to contact me at 514-398-3195.

Yours sincerely,

Anne Clark  
Benefits Administrative Coordinator, Health & Wellbeing  
Human Resources  
McGill University  
514-398-3195