Sustainability and Community Engagement Fund

Grant program 2014- 2015

Application Form

Due by midnight on Nov 3rd, 2014
Send to sustainability@uregina.ca

Date: 31.10.2014

Project Title
Reducing pesticide use on campus: plant health care model for campus greens.

Amount requested from the SCE Fund: $5000.00

Project Leader (main contact)
Name: Dr. Tanya E. S. Dahms, Faculty, Professor of Biochemistry
Email: tanya.dahms@uregina.ca, Phone number: 4246
Student/Staff ID number: 200208325, Affiliation (unit, faculty): Science

Team member information
Names: Drs. Chris Yost and Scott Wilson, Faculty, Professors of Biology
Email: chris.yost@uregina.ca; scott.wilson@uregina.ca
Affiliation (unit, faculty): Science
Role in project: Helping high school students collect data.

Team member information
Indicate - Student or **Staff** (faculty or **admin**)
Names: Pat Patton and Carol Reyda
Email: pat.patton@uregina.ca; carol.reyda@uregina.ca
Affiliation (student group, unit, faculty, not applicable): Facilities management
Role in project: Coordination with WCA and supervision of summer student.

Partner information (community and/or university)
Organization: Wascana Center Authority (WCA)
Name: Mike Mamona, Director
Email: mike.mamona@wascana.ca, Phone number: 306-347-1812
Role in project: Orchestrating differential plot treatment by WCA.

Partner information (community and/or university)
Organization: Miller high school
Name: Heather Haynes, M. A., teacher
Email: h.haynes@rcsd.ca, Phone number: 306-791-7230
Role in project: With student research team, she is collecting data on the plots.

SCOPE

Project description (200 words) Please describe what is included in the project as well as what is not included in the project.

We aim to implement the plant health care model (PHCM) on campus greens to control invasive plant species as an alternative to pesticides. Last year we compared two small plots, one with a modified PCHM and another with pesticides. Heather Haynes and her student research team (Miller High School) assessed plot ecology (insects and plants) and soil microbiology and chemistry, with guidance from Drs. Scott Wilson, Chris Yost, and Tanya Dahms, respectively. Preliminary data indicate the PHCM plot has richer turf with better coverage than the pesticide plot, even without aeration, over seeding and organic fertilizing. Hand weeding of the small plot was accomplished in 2 hours by one student last summer. Wascana Center Authority has been meeting with a UofR *ad hoc* committee for over a year to determine how they can help in the alternative treatment of plots. We would like to expand this project to a larger area on campus, preferably the center green that was damaged so badly last year by improper drainage. The PHCM with over seeding, top dressing, aeration/dethatching, high mowing and organic fertilizer would greatly benefit that area. Haynes and her students will assess the plots in spring and fall with expert assistance.

Sustainability

Short term objectives (four Rs):

- Reduce pesticide use on campus
- Rehabilitate the center green
- Research training for high school students
- Re-educate faculty, students and staff about pesticide alternatives.

Long term objectives:

- Reduce pesticide use city and province wide
- Lead the province in the plant health care model
- Teach high school students to use the scientific method
- Educate the general public towards a pesticide free city and province

Anticipated impacts (results):

By reducing pesticide use, we will immediately improve air quality at the University of Regina, since any pesticides tracked into the buildings circulate in our air system until they are completely degraded. We will improve the health and safety of all UofR faculty, staff and students, along with those who visit our campus, including small children who take part in UofR summer camps on our greens! Through education about the project, the public will become more aware of pesticide alternatives and the connection between our health and the environment.

Community Engagement

Our aim is to transform our campus greens into a safe and healthy environment as a model for the city and province. In doing so, we will engage the Miller high school research team that has been assembled by Ms. Heather Haynes. These students will formally learn the scientific method, how to formulate hypotheses and design

experiments to test them, in the context of a real world issue. These students will have the opportunity to present their results during sustainability month at UofR, thus educating faculty, staff and students. We will put out a joint press release from UofR and Miller high school highlighting the project, and therefore use non formal education (media) to engage the public.

Anticipated impacts (results):

We expect that, like at many other Universities, the PHCM will be a feasible method of weed control to maintain both a healthy and aesthetic environment. We expect to be able to rehabilitate the center green on campus and provide proof of principle for the PHCM under our climate conditions. With a campus proof of concept, we can engage the community who will more readily consider adopting similar practices. The UofR campus would become a living laboratory and model, linking health and the environment, two main pillars of sustainable living.

Long term impacts

What are the long term impacts that you hope will result from this project? What is the potential for institutionalization of the project? You may include identifying future leaders and funding sources to sustain the project. (100 words)

We expect to transform the UofR campus into a healthy and safe environment for faculty, staff, students and visitors. We could lounge on the grass or grow food on campus without absorbing or ingesting pesticides. We would no longer contribute to the contamination of our air, soil and surrounding water. The PHCM saves turf maintenance cost in the long term by reducing the use of water and pesticides and boosting soil fertility. Thus, we expect the project to be sustainable over time. Facilities management would be the logical long term partner and future leader of this project.

FINANCIAL

Eligible expenses – materials, labour, communication (printed material, etc.)

Ineligible expenses – travel, training, computers, office equipment, office space.

Please provide a total project budget. Include expenses for materials, wages, communications.

Include total project revenues from all funding sources (actual and in-kind)

Items purchased, or expenses made, before funding is approved are not eligible

Expenses

Description	Estimated Cost	
Turf aeration/dethatching/over seeding/top dressing/fertilizing	$4300.00	Based on quote from last year adjusted for a larger plot
AMS turf profiler	$159.70 x 2 = $319.40 + $25.00 = $344.40	*See link for details
Undergraduate student – rate based on fourth year student	$17.74 x 20 h = $354.80	Rate with vacation pay
Total	**$4999.20**	

*http://www.forestry-suppliers.com/product_pages/Products.asp?mi=20050&title=AMS+Turf+Profiler&itemnum=77041

In-Kind

Description		Supplier/Partner	Confirmed?
Student mentorship	$100/h x 4h	Dr. Tanya Dahms	Yes
Student mentorship	$100/h x 4h	Dr. Chris Yost	Yes
Student mentorship	$100/h x 4h	Dr. Scott Wilson	Yes
Planning meetings	$150/h x 4h	Mike Mamona, D'arcy Schenk	Yes
Plot assessment	$300/h x 12 h	Heather Haynes and students	Yes
Media releases	$100.00	UofR and Miller communications	Yes
Total In-Kind	**$5500**		

Projects will be paid out funds in the following manner:

- 50% when project is 50% completed
- 50% after receipt of final report

If you require a different cash flow, please indicate project milestones and amounts.

SCHEDULE

General schedule and completion date for the project.

Month	April	May	June	July	August	September
	Plot analysis	Hand weed/apply compost tea				Plot analysis
	Overseed/top dress	Aerate/dethatch			Fertilize	
			High mow/deep water			

Figure 1: Plant health care model of the center green with assessment. Before and after treatment with the PHCM (center green) and pesticides/status quo (comparable site), the plot will be assessed by the Miller high school research team with expert assistance from Drs. Wilson and Yost. One part-time student will be hired (we expect to partner with RPIRG who also hires a student part-time) to monitor the center green, hand pick weeds, prepare and apply compost tea several times during the summer. The Lawn Butler will over seed and top dress the center green early spring, followed by aeration/dethatching late spring and will apply slow release organic fertilizer to the plot at least once. The Wascana Center Authority will deep water the plot, with help from the student, and high mow the plot when required throughout the summer. A full report will be prepared by Haynes and her research team with guidance from Dr. Dahms.

The project will begin with the plot assessment in May 2015 and will be complete with the final plot assessment in late September 2015.

IMPLEMENTATION

Tasks and Responsibilities

- *Indicate clearly all activities associated with the proposed project, the person responsible and the length of time each task is expected to take. Use the table below (expanded as required) to summarize this information.*
- *Required tasks – Financial Control, Evaluation, Final Report.*

Activity or Task	Estimated Time	Team Member in Charge
Financial Control	5 h	Dahms
Plot Analysis	28 h	Dahms, Haynes, Wilson, Yost
PHCM	8 h	Mamona, Schenk
PHCM	24 h	Lawn Butler
PHCM	20 h	Hired student/Reyda

Evaluation

Please comment on how you intend to evaluate the project.

Dahms will coordinate two data collection sessions, one in the spring and one in fall. Based on the 2014 data (see attached), we will be able to improve our sampling methods. Haynes and her research team, as last year, will evaluate plot ecology as a function of plant species, insects, nematodes, and microbes and soil chemistry. Dr. Wilson will help students compare the plant species using Daubenmire's scale from random samples of half meter areas within each plot. Haynes and her students will set insect traps and take soil samples in random areas across the plots. Under the direction of Dr. Yost, students will extract portions of the soil samples from which they will culture microbes and nematodes. The remainder of the soil samples will be used to test their pH, nitrogen, phosphate and potassium. Haynes and her students will collate and analyze the data and prepare a report. Dahms and Yost will edit the report for submission to the President's Advisory Committee on Sustainability and the Sustainability and Community Engagement Fund.

Safety

How will you ensure the safety of project members or volunteers while working on this project?
All high school students will have laboratory safety training and the student to be hired will complete a basic safety training class and use leather gloves when weeding.

Communication Plan

Please comment if and how you will communicate with the larger campus community.
We will communicate through the front page of the UofR website with a full news story on this community-based research project. Plots will be conspicuously signed with a digital tag pointing to a website with a short project description. The students will present their data in the form of a talk or poster during campus sustainability month. We expect to have extensive media coverage that will tell our story to the general public. Dahms, Haynes and Yost will disseminate the project in a peer reviewed education journal.

Recognition

How will the SCEF and all partners be recognized for their support of this project?

The SCEF will be recognized during all presentations, media events and news stories.

Attachments

Please attach any other supporting documents – letters of approval, support, funding, detailed budgets, other.

1. Email confirmation of participation
2. Plant health care model plan 2014
3. Map of 2014 test plots
4. Plot assessment data from Spring 2014
5. Media release Spring 2014
6. Media coverage Spring 2014

Please contact sustainability@uregina.ca if you have any questions

From: Chris Yost <chris.yost@uregina.ca>
To: Tanya Dahms <Tanya.Dahms@uregina.ca>
Date: 11/3/2014 10:19 AM
Subject: Re: sustainability fund

Hi Tanya,

You can use me as a collaborator on the application. We would continue to need access for the soil corers. My recommendation would be to buy a couple of these that can be stored with Heather so that we don't have to rely on Scott's research equipment. I can't imagine that corers are too expensive. Other than that all the other supplies are cheap and I can absorb the costs for bacterial media prep.

thanks
Chris

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From: Scott Wilson
To: Tanya Dahms; Chris Yost
Date: 11/3/2014 7:37 AM
Subject: Re: sustainability fund

Hi Tanya,
Sure, you can put me on the application.
Those are the corers you need.

Scott
***

From: Mike Mamona <mike.mamona@wascana.ca>
To: Tanya Dahms <Tanya.Dahms@uregina.ca>, Heather Haynes <h.haynes@rcsd.ca>
Date: 11/3/2014 8:55 AM
Subject: RE: partner for grant application
Attachments: image003.jpg

Good job Tanya, yes you may use my name as a reference.

Mike Mamona
COO - Chief Operating Officer
Wascana Centre Authority
Business - (306) 522-3661; Direct - (306) 347-1812; Cell - (306) 552-9790
Email - mike.mamona@wascana.ca<mailto:mike.mamona@wascana.ca>

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From: "Haynes, Heather" <h.haynes@rcsd.ca>
To: Tanya Dahms <Tanya.Dahms@uregina.ca>
CC: Mike Mamona <Mike.mamona@wascana.ca>
Date: 11/3/2014 8:25 AM
Subject: Re: partner for grant application

Yes Tanya please feel free to use my name.

Take care,

Heather
***

From: Carol Reyda
To: Tanya Dahms
Date: 11/3/2014 4:40 PM
Subject: Re: no more than five?

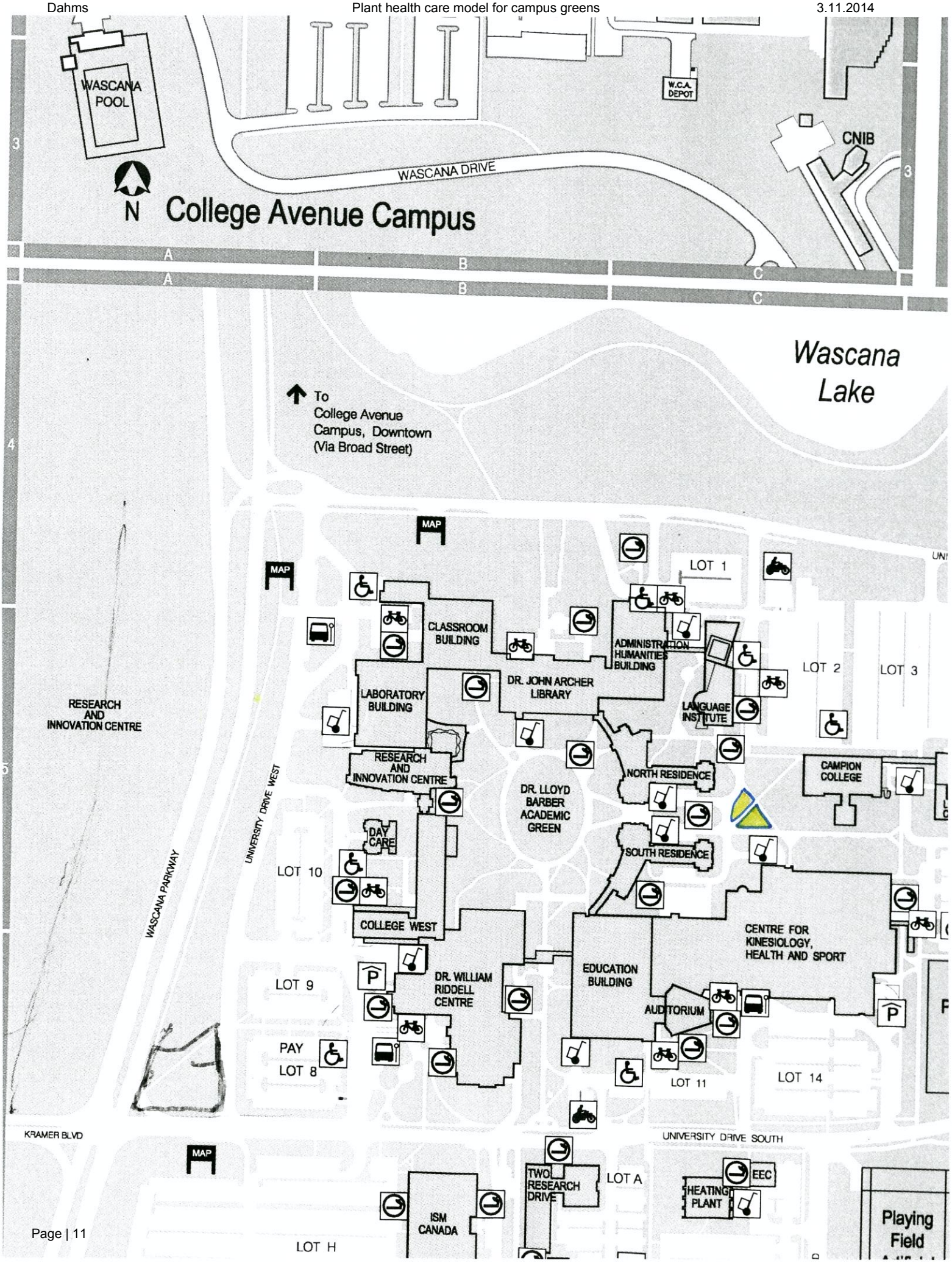
Hi Tanya,
I will likely excuse myself from evaluating this application because of the conflict.
So feel free to put down for student supervision.
Carol

Plant Health Care Model: University of Regina – trial location plan – June 8, 2014
PLOTS EAST OF RESIDENCES North plot Health care plot

Planning meeting – June 19/14 – Carol Reyda, Alberto Ortiz, D'arcy Schenk, Mike Mamona, Nelson Quevillon. By phone Tanya Dahms.

Activity	What is required	Responsibility	Cost
Mulching beds	Normal maintenance as long as no pesticides. If spraying is needed, advise Pat who will advise committee	WCA	WCA
Pruning trees	Normal	WCA	Regular as needed but additional is $
Lawn Care			
Mow high	Yes currently mowers set at 3". Mowed at same time. Monitoring grass height U of R	WCA	No extra – Mowing is 2 times in a 9 day cycle
Dethatch - vericutting	Yes	WCA Not normally. Do not have equipment. Carol to arrange labour	additional $
Aerate	Yes	WCA Not normally. Do not have equipment. Carol to arrange labour	additional $
Top dressing	Yes - may be mulch or soil	WCA Not normally. Do not have equipment. Carol to arrange labour	additional $
Overseed	Yes	WCA Not normally. Do not have equipment. Will supply seed. Carol to arrange labour	Donation WCA
Watering	Knowing generally what the watering schedule is. Don't need specifics.	WCA	No extra
Compost Tea	Yes	U of R - Tanya	Wascana does not have resource or knowledge
Regular and systematic monitoring	Yes	U of R - Tanya and crew - Testing will happen at least twice. Take photo once a week	Everyone keep track and log time. Tanya scientific information. Carol/Alberto regular monitoring and collect logging
Handpicking of Weeds	Yes	U of R - Carol to coordinate Volunteers and time logs	
Fertilizing -	Yes – It is different than	WCA will apply. U of R to	additional cost

organic	compost tea	supply (Carol)	
Noxious weed control	Treatment to control noxious weeds as per prov legislation – would like to hand pick these weeds.	WCA – identify. Advise Pat. Picking U of R Could get volunteers.	As per normal operating costs
Rodent Control	No issues	WCA sulphur bombs	


WASCANA POOL
W.C.A. DEPOT
CNIB
WASCANA DRIVE
N
College Avenue Campus
Wascana Lake
To College Avenue Campus, Downtown (Via Broad Street)
MAP
LOT 1
CLASSROOM BUILDING
ADMINISTRATION HUMANITIES BUILDING
LOT 2
LOT 3
LABORATORY BUILDING
DR. JOHN ARCHER LIBRARY
LANGUAGE INSTITUTE
RESEARCH AND INNOVATION CENTRE
RESEARCH AND INNOVATION CENTRE
NORTH RESIDENCE
CAMPION COLLEGE
DR. LLOYD BARBER ACADEMIC GREEN
DAY CARE
SOUTH RESIDENCE
UNIVERSITY DRIVE WEST
WASCANA PARKWAY
LOT 10
COLLEGE WEST
CENTRE FOR KINESIOLOGY, HEALTH AND SPORT
LOT 9
DR. WILLIAM RIDDELL CENTRE
EDUCATION BUILDING
AUDITORIUM
PAY LOT 8
LOT 11
LOT 14
KRAMER BLVD
UNIVERSITY DRIVE SOUTH
MAP
TWO RESEARCH DRIVE
LOT A
EEC
HEATING PLANT
ISM CANADA
LOT H
Playing Field

Nematode Counts

Plot	Number of Nematodes
1B	22
1C	82
2A	95
2C	730???

Insect Counts

Plot	Number of Insects
1A	4
1B	4
1C	5
2A	4
2B	0
2C	5

Bacterial Counts

	Plot 1A	Plot 2A
TY 10^{-5} .00001	**258**	**492**
N-Free 10^{-3} 0.001	**2608**	**1808**
	Plot 1C	**Plot 2C**
TY 10^{-5} .00001	**185**	**170**
N-Free 10^{-3} 0.001	**1920**	**2080**

Turf Assessment

Plot	Kentucky Blue (%)	DL (%)	LTR (%)	Fescue (%)	Other Species (%)
1	85	0	15	15	0
2	35	0	62	15	0
3	85	0	15	37	0
4	85	0	35	15	3 Ash
5	62	0	35	15	3 Elm

Soil Analysis

	Plot 1A	Plot 1B	Plot 1C
pH	8	8	8
Phosphorus	high	high	high
Nitrogen	Trace	Trace	Low
Potassium	very low (+20)	low (+18)	very low (+20)
	Plot 2A	Plot 2B	Plot 2C
pH	8	8	8
Phosphorus	medium	high	high
Nitrogen	none	trace	none
Potassium	very low (+20)	very low (+18)	Medium (+14)

Regina Catholic Schools
www.rcsd.ca

University of Regina

June 12, 2014

Media Advisory: Miller/UofR Plant Health Care Research Collaboration

REGINA – On June 14, fourteen students from Miller Comprehensive Catholic High School will join teacher and university researchers to begin a research project aimed at reducing herbicide and pesticide use.

The research project, which is 14 years in the making, will compare the results of using a "Plant Health Care (PHC)" model against a traditional pesticide and herbicide combination on a test plot behind the University of Regina's Kinesiology Building. It is the first step of the project ultimately meant to reduce pesticide use in the City of Regina.

Three professional university researchers are pleased to partner with two teacher researchers and 14 bright and enthusiastic students to complete the research project. The students, all from Miller Comprehensive Catholic High School, were chosen to participate based on their competencies and interest in Environmental Science.

Interviews with staff and students are available. The event will take place:

When: Saturday, June 14, 2014
Time: 10:30 am
Location:

Dr. Lloyd Barber Academic Green

University of Regina

3737 Wascana Parkway
Regina, Saskatchewan
* Further directions can be obtained by contacting Heather Haynes

For more information, please contact:

Heather Haynes
Teacher Researcher
Miller Comprehensive Catholic High School
306-552-6910

Jay Branch
Manager, Public Affairs
External Relations
University of Regina
306-585-5439

Noah Wernikowski
Communications Officer
Regina Catholic Schools
306-791-1734

University of Regina begins pesticide research study

http://www.leaderpost.com/technology/University+Regina+begins+pesticide+research+study/9942611/story.html
By Terrence McEachern, The Leader-Post June 16, 2014

- Story
- Photos (1)

Miller High School biology teacher Heather Haynes, left, together with her students speak with plant ecologist Scott Wilson at the University of Regina on Saturday.

Photograph by: Michael Bell , Regina Leader-Post

A group of university professors, high school students and teachers are hoping that a new research project will lead to the reduction, and ideally elimination, of pesticide use on the University of Regina campus.

"I would like to eliminate them because any pesticides that we have on our landscape here at U of R, they're tracked into the university and then they're circulated," said Tanya Dahms, a professor of biochemistry at the university.

On Saturday, students from Miller Comprehensive Catholic High School and university staff began collecting data - such as plant species diversity, insect counts and soil composition - from two plots of grass measuring 100 cm by 50 cm in the academic green area behind the Kinesiology Building.

One of the plots will be treated with pesticides whereas the test plot will be treated naturally through a

plant health care model.

That alternative model involves spraying the plot with compose tea and reintroducing bacteria into the soil. Pesticides reduce bacteria in the soil, which is vital for healthy soil structure and decomposing plants so nutrients can be released into the soil.

The test plot will also be mowed less and not as short as the rest of the lawn. Cutting grass short contributes to weed development, Dahms explained.

In the fall, data will be collected again from the plots and compared to Saturday's baseline results in order to form a comparison.

Dahms wants to see the research expanded into more plots for study so eventually researchers will be in a position to recommend the natural care model to university administrators as the normal practice for lawn care.

One of the drawbacks is that the plant care model can be more costly than pesticide use because additional labour is required to pull weeds. For Heather Haynes, the research project is a great opportunity for 14 of her science students to get handson experience in the field and in the lab.

"This is inquiry learning at its finest. We have a hypothesis, we have the tools and we have our brains. Let's put them all together and let's see if we can find out some answers," said Haynes, a teacher at Miller Comprehensive Catholic High School.

"Nobody who is working on this research team - whether you're a professor or a teacher or student - knows what the outcome is going to be," she said.

"It's science. We're all acting as scientists all together. So, clearly, what more does a science teacher want for her kids?" tmceachern@leaderpost.com

Other media links:

http://regina.ctvnews.ca/video?clipId=381992 ~ 3:05
http://globalnews.ca/regina/program/evening-news-regina ~ 0:13 and 1:23