



# The Clean Energy Fund Grants - Application

Please thoroughly read the call for applications prior to submitting your proposal. We will not consider incomplete applications. **In order to be reviewed by the committee, applicants must first submit their proposal to the campus area responsible for oversight in order to receive preliminary approval.** Applications receiving preliminary approval or questions regarding the application process should be e-mailed to the coordinator at [cleanenergy@evergreen.edu](mailto:cleanenergy@evergreen.edu) before the deadline.

## Project Title

2013 Broccoli Variety Trial

## Project Lead

Arij Beebe-Sweet

A NUMBER

PHONE

E-MAIL

## Student, Staff or Faculty Group

Food, Health & Sustainability

### STUDENTS

Junior, Genetics

### FACULTY OR STAFF

Martha Rosemeyer

## Faculty or Staff Sponsor

Martha Rosemeyer  
[rosemeym@evergreen.edu](mailto:rosemeym@evergreen.edu)

## Campus Location

Evergreen Farm

## Primary Affected Area

Organic Farm

## Requested Budget

\$2,500

## Academic Term

Spring-Fall 2013

## Date

3May203

End of Fall Qtr 2013

## Project Description

I am conducting a variety trial on the Evergreen farm to determine the optimal broccoli strain for producing in the environment there. This is of special concern as the Evergreen farm soil is infected with clubroot, *plasmodiophora brassicae*. An extremely resilient pathogen, it infects the roots and impairs growth of members of the *brassicae* genus, which include many agriculturally significant crops: broccoli, cauliflower, kale, rutabaga, canola, and more. In identifying the best broccoli variety to grow in the presence of this pathogen, we not only inform the farm of the best varieties to grow now, but such information will also add to the general scientific knowledge of resistance to *p. brassicae*. I will also be conducting microscopy of the infected plant roots to look for clues as to the mechanisms of resistance, and using polymerase chain reaction (PCR) to create a precise soil mapping of the infestation level of the pathogen in the plot.

## Timeline

I have already planted out seeds. The seedlings will be transplanted out into the plots in mid-May and soil samples collected. During the summer, in addition to caring for the plants, I will process the soil samples and perform the DNA analysis utilizing PCR. In the late summer/fall at harvest time, I will analyze the different varieties for resistance and also begin microscopic examination of the root galls.

## Metrics

Plant resistance will be measured on a 10 point scale as developed and standardized by the University of Wisconsin's Plant Pathology Department. Statistical analysis will be used to correlate resistance with variety, including for factors such as soil infestation levels as determined by the PCR analysis.



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**Other Participants**  
First and last name, Phone and E-mail

**CEC Notes (for office use)**

**Areas affected by proposed project**

Prior to a full review by the Clean Energy Committee, all grants must receive preliminary approval from the campus area to be responsible for the administration and oversight of the grant. Please refer to the call for applications for help identifying the area of best suited for oversight of your project. If you have further questions regarding areas affected by your project please contact the coordinator at [cleanenergy@evergreen.edu](mailto:cleanenergy@evergreen.edu). Be sure to allow yourself enough time to communicate with staff and faculty before the deadline. When preliminary approval is received, please have the affected area submit an e-mail of support for your proposal.

Affected Area	Approval Required	Approval Received
Faculty / Staff Sponsor	Always	Yes
Associate Vice President for Academic Budget and Financial Planning	No	No
Advising	No	No
Athletics and Recreation	No	No
Campus Land Use Committee	No	No
Director of Facilities	No	No
Director of Student Activities	No	No
Environmental Health & Safety Officer	No	No
Residential and Dining Services	No	No
Science Operations Manager	Yes	Yes
Organic Farm Manager	Yes	Yes
Visual Arts Operations Manager	No	No

**Greener Categories (Please select all that apply):**

	Research	Implementation	Education
Renewable Energy			
Resource Conservation	X		X
Sustainability Strategies	X		X



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### Sustainability

Crops that fail to thrive due to pathogens can lead to solutions that include pesticide application, increased fertilization, and/or increased land usage to compensate for crop losses. These recourses are all more energy intensive than necessary. By selecting the appropriate variety to grow in the adverse conditions present on the Evergreen farm (and other locations infested with clubroot), we can enable farmers to avoid these more energy intensive and ecologically damaging responses.

### Continuity

As part of the effort to carry this work forward, the results of this variety trial will be collected into a scientific paper detailing the results of the variety trial, the infestation mapping, and the microscopy images and analysis.