

# From Lawn to Forest: Attempted Mitigation of the Fieldhouse Construction

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## Abstract

The purpose of this study is to experiment with various soil amendments in an effort to develop an effective method for reintroducing temperate forest ecosystems into previously managed landscapes. Preliminary observations suggest that leaf mulch is an effective tool for suppressing weed growth and retaining soil moisture.

## Introduction

As human population and technological capacity continue to expand, our impact upon the world's ecosystems and the wildlife they support is reaching levels never before seen. Habitat loss has been, and will continue to be, a key contributor to the mass extinction event now occurring as the human race extends its reach all over the world. The preservation and restoration of forest habitat is thus an important task in seeking to preserve both floral and faunal biodiversity, as well as the various other ecosystem services which forests provide. This study will seek to discover an effective method for reintroducing temperate forest ecosystems onto land which previously supported managed lawn.



## Objectives

- Reintroduce native forest ecosystems in an attempt to mitigate the loss of mature forest caused by the construction of the Fieldhouse Complex
- Examine the effects of various soil treatments in regard to weed growth, seed germination, and herbaceous plant viability
- Reduce total area of maintained lawn on Calvin's campus

## Hypotheses

- Leaf mulch will aid in the suppression of weeds and the retention of moisture.
- Transplant viability will be highest in shaded areas.
- Weeds will be most abundant in the bare soil treatment areas and the rototilled soil treatment areas.



## Methods

- Saplings (10 to 20 years old) were planted throughout the Burton Street site in early spring
- Restoration site was cleared of non-native species.
- Leaf mulch was sprayed over the surface of the ground.
- Six experimental replicates were created, each containing four triangular quadrats (See Figure 1). Each quadrat was given one of four soil treatments: 2" leaf mulch, 4" leaf mulch, 2" leaf mulch + rototilled soil, No leaf mulch
- Eight *Viburnum opulus* (Highbush Cranberry) were planted in each replicate. (Represented by red markings in Figure 1)
- Six varieties of herbaceous plants (Represented by black markings in Figure 1) were arranged randomly and planted around each of the four corner trees and each of the four *Viburnum opulus* at the center of each quadrat. These herbaceous plants included:
  - *Geranium maculatum* (Wild Geranium)
  - *Podophyllum peltatum* (May Apple - sand genotype)
  - *Podophyllum peltatum* (May Apple - clay genotype)
  - *Diarrhena americana* (Beak Grass)
  - *Arisaema triphyllum* (Jack-in-the-Pulpit)
  - *Carex pensylvanica* (Pennsylvania Sedge)
- Woodland edge seed mix was spread over the replicates.
- Measurements of herbaceous transplants were taken, including: height, base diameter, # of shoots, # of forks, health index (1-5) and shade index (1-4).

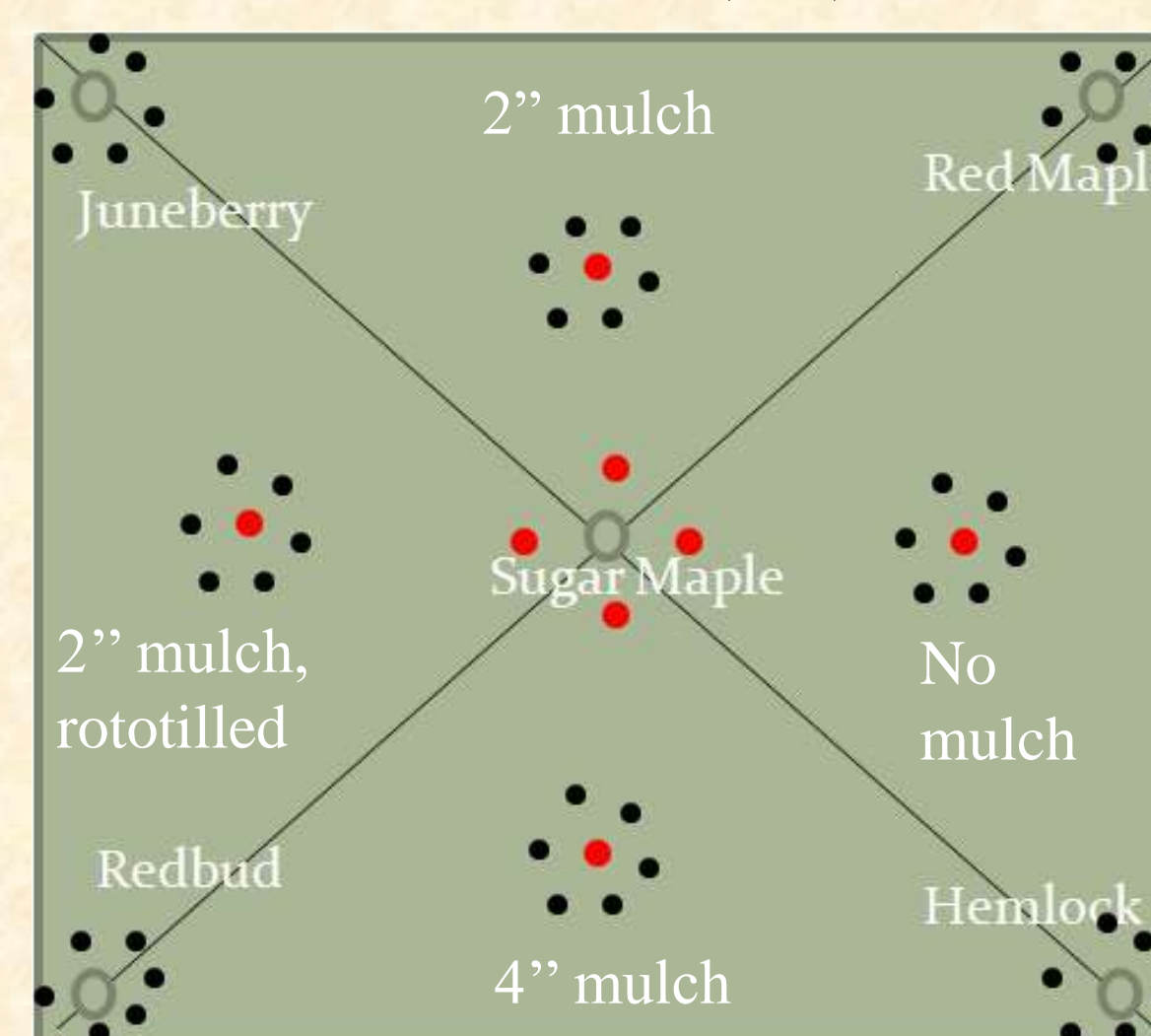


Figure 1:  
Diagram of  
Experimental  
Replicate

## Results and Discussion

The long term nature of our study prevents us from obtaining any conclusive results at this point. However, preliminary observations show that weeds are most prevalent in the bare soil treatment areas, which suggests that the leaf mulch is suppressing weed growth. Soil moisture content is lowest in the bare soil treatment areas, supporting our initial hypothesis that leaf mulch would aid in moisture retention. The two replicates closest to the lawn contained the most overall weed growth, and the weeds in these replicates were primarily Kentucky Blue Grass. This suggests that the spread of grass into the restoration site is a concern which will need to be monitored in the coming years.

## Conclusions

Although our results are only preliminary, the leaf mulch has thus far been effective at retaining moisture and suppressing weed growth. The study will continue for many years to come, and as observational data accumulate, the effectiveness of the various treatments will be more conclusively assessed. Factors such as weed growth, native seed germination, exposure to sunlight, and transplant viability will continue to be monitored throughout the length of the study.



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