

## Grow-Box Project

### Purpose/Objective:

To evaluate the effect of compost tea applications on native grass seed and native wildflower germination and growth in a “grow-box”.

### Methods/Procedures:

In this case, a grow-box is a twenty-gallon tubeware container with drainage holes drilled into the bottom set upon a pallet. Four matching grow-boxes were created. Each grow-box contains approximately two inches of wood chips on the bottom to increase drainage. The growing medium is a 50/50 mix of screened SMI compost and vermiculite plus .5 gallon of rock dust was added to the entire mixture to be split among the four containers. Each grow-box is filled with approximately 7 inches of growing medium.

Each grow-box will either be a control or receive two, 2-gallon compost tea treatments, one at seeding and one a week later.

Grow-box 1: Native grass seed

Grow-box 2: Native grass seed mix and compost tea treatments

Grow-box 3: Native wildflower seed mix

Grow-box 4: Native wildflower seed mix and compost tea treatments

The native grass seed mix is composed of *Festuca idahoensis*, *Elymus glaucus*, *Nessella pulchra*, *Poa secunda* secunda. Grow-boxes 1 and 2 received ¼ baggie of the native grass mix. The native wildflower mix is composed of (Harmony Farm’s sku:nch). Grow-boxes 3 and 4 received .125 lbs of the native wildflower mix. Each box will receive approximately the same amount of water (minus the amount of compost tea added).

### Budget:

Budget Item	Quantity SMI	Amount	Total
Tuperware (Reusable Grow-Box)	4	10	40
Compost	@25 gallons		
Vermiculite	@25 gallons (1/2 bag)	1	10
Ingredients – Rock Dust	.5 gallons	-	
Compost Tea	8 gallons	-	
Soil Biology Testing	SMI 4	40	160
Native Seeds		1	40
Total (estimate)			250

### Data:

Date	GB 1	GB #2	GB #3	GB #4
10.01.07	C-080007-C1-3	C-080007-C1-3	C-080007-C1-3	C-080007-C1-3
10.17.07		T-101607-GBA		T-101607-GBA
10.24.07		T-102207-M1-3		T-102207-M1-3
12.17.07	S.121707.GB1	S.121707.GB2	S.121707.GB3	S.121707.GB4

## Notes/Observations:

- 10/17/07
  - Initial project set-up. Seeded and added tea.
- 10/22/07
  - Numerous wildflower seeds have germinated.
- 10/23/07
  - CT Grasses are sprouting
  - Approximately double the number of CT wildflowers are sprouting in comparison to the non-CT grow-box
- 10/24/07
  - Both CT grow-boxes are germinating approximately double in numbers.
- 10/26/07
  - Both CT grow-boxes are germinating approximately double in numbers.
- 11/11/07
  - Both CT grow-boxes are continuing at approximately 20-30% higher germination.
- 11/16/07
  - Both CT grow-boxes have had approximately 10-20% higher germination.
- 11/23/07 (no pictures)
  - The wildflower CT box is approximately 5% taller.
- 11/30/07 (no pictures)
  - Grass heights are approximately the same in each grow-box with the CT grass box having a 10-20% higher germination rate.
- 12/10/07
  - Both CT grow-boxes have had approximately 10-20% higher seed germination. The wildflower CT box has approximately 5 % taller plants. The grass heights do not have noticeable difference.
- 01/29/07
  - Both the grass and the wildflower grow-boxes with and without compost tea treatments look to have the same height and growth density respectively.

## Discussion:

Through observation, both the grow-boxes that received two applications of compost tea had approximately 20-30% more germination success within the first two-three weeks. By the end of the fourth week, the germination rate was approximately 10-20% higher in both of the compost tea treated grow-boxes. By the end of week eight, the compost tea grow-boxes remain at 10-20% greater density plus the wildflower compost tea treated grow-box is approximately 5% taller than the non-treated grow-box. In January 2008, approximately 14 weeks after the initial set-up of the grow-boxes, it has become difficult to assess any difference in growth height and density between the two groups.

In reviewing the soil biology of each grow-box in comparison to the original compost used: (Please keep in mind the original growing medium was 50% compost and 50% vermiculite plus rock dust, which could test differently than the 100% compost.)

- Active bacteria and total bacteria decreased. This is interesting because both of the compost teas used for treatment applications had total bacteria numbers of 1600-5300 and active bacteria numbers of 130-215, both higher than the initial compost.
- Active fungi and total fungi stayed consistent, with one total fungi value jumping higher in the non-treated grow-box and the other non-treated grow-box decreasing.
- TB/TF and AF/AB ratio increased due to lower bacteria numbers.

Because this was not a replicated study and the initial soil biology numbers may have been slightly different than the compost test results from October 1, 2007, it is difficult to make a conclusive statement of the effects of the compost tea on the final soil biology values. What is interesting is that there was an observable visual difference in the germination rate and first 8 weeks of growth between the compost tea treated grow boxes and the non-treated grow-boxes and not a clear distinction in the soil biology results. It is worth noting, at the end of January, both sets of grow-boxes

respectively, appeared at similar growth height and density. Is it possible that there would have been a noticeable trend in the soil biology in the initial 8-weeks of this project to correspond with the visual observations? Or is it possible that the compost tea affected the soil chemistry and stimulated the growth of the compost tea treated grow-boxes?

### **What's Next In This Project:**

The grow-boxes will be planted out into one of the cut star-thistle plots and monitored.

### **Other Ideas:**

This project has stimulated several ideas for other projects.

- To conduct a similar observational study evaluating the germination percentage with a sterile soil medium and/or a soil medium collected from our grasslands. Considerations would be to add replication, initial soil biology and soil chemistry tests and repeat the tests at the five to six week mark of the project. Perhaps adding the variable of compost in comparison to compost tea.
- Evaluating the germination rates of specific seeds with applications (or seed dip) of compost tea in seed flats with individual cells in comparison to a control. Possibly, adding a variable of a mycorrhiza application.