Spring 2009

SIU Local Organic Garden Initiative of Carbondale

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Introduction

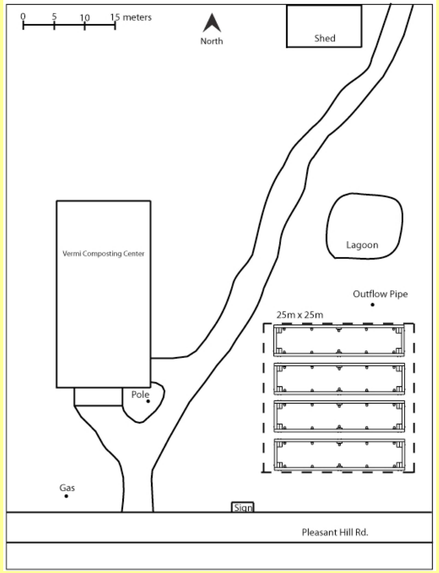
In Carbondale, off of Pleasant Hill Rd. at the Vermi-composting facility is a small plot of land approximately one-third acre in area that will become the site for the student organic garden. The site itself is a quadrangle in which crops will take up a 25m x 25m section in the front of the Vermi-composting facility. There will be four raised beds that are 1ft. tall, 4x20 feet in area. This land shares the same bountiful soil and moderate climate the makes southern Illinois so productive and lush. This land has been fallow for years, serving only as a "front lawn" for the Vermi-composting facility. However, this plot has had soil testing done and shows potential because it is nutrient rich, which is expected from this area. This land is owned by SIU, and there have been many discussions between university representatives, members of the Student Environmental Center (SEC), and a 20 student strong RSO, with the goal of transforming the land into a sustainable and beautiful organic campus garden. The yield of the garden will be served in the campus dining halls. This food will decrease our food miles at SIU, supporting the local community and, ultimately, helping to create a culture of "localvores." Working with us is Chef Bill Connors, chef at Lentz Hall, who has been an integral part in deciding which crops should be planted to fill his menu at the halls.

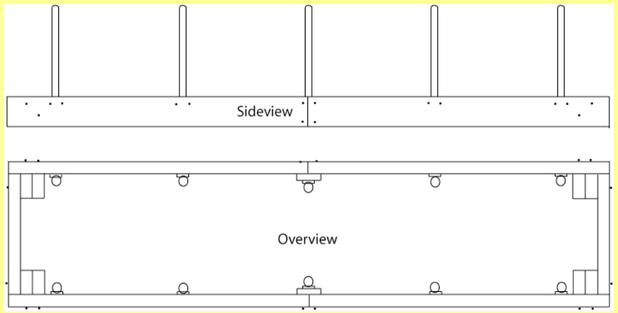
Water Needs Analysis

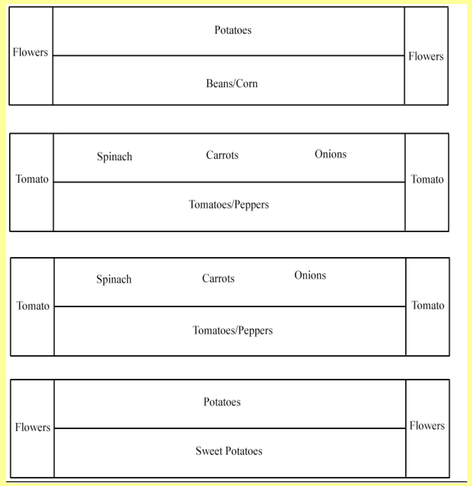
Water is an obvious and crucial input to a successful garden. The Vermi-composting Center has offered to allow the student garden to use water from the facility for irrigation during the first year of planting. In the future, the Center has offered to investigate the installation of gutters and a system to capture rainwater runoff from the building's roof for use for the garden. Rainwater is usually free of salts, and using rainwater also reduces energy consumption associated with providing potable water for non-potable purposes. A general irrigation recommendation for vegetable gardens is to supply one inch of water a week using irrigation to make up for shortfalls in precipitation (Univ. of Ill. Extension).

We estimated the need for irrigation by calculating the weekly precipitation shortfall using daily precipitation data from NOAA'S NCDC for the Carbondale, Illinois Sewage Plant Weather Station. In order to assess the feasibility of using rainwater capture to supply irrigation needs, we used the method outlined in the Texas Rainwater Harvesting Manual. Supply available for storage was estimated by calculating the amount of precipitation falling on the catchment of the building's roof with modification for collection inefficiency. Demand was estimated as the precipitation shortfall modified for irrigation inefficiency. The amount of water left in storage at the end of each week was calculated by adding the amount in storage at the beginning of the week and the amount of precipitation captured by the system during the week and subtracting the water used to meet irrigation demand during the period. The amount in storage at the end of the period was never allowed to exceed the size of the storage container. A 500 gallon drum would be able to meet calculated irrigation need every week of the growing season in 70% of the examined years but was insufficient for two weeks in 13.3% of the years and was insufficient for one week in 16.7% of the years.

Garden Site and Design Elements







Qty.	Item Description
5	2" x 12" x 10' Untreated Lumber
1	2" x 4" x 8' Untreated Lumber
1	¾" x 10' White PVC Pipe
5	½" x 10' White PVC Pipe
10	2 Hole ¾ Pipe Straps
16	¼" x 5" Galv. Lag Screws
20	¼" x 1 1/2' Galv. Lag Screws
20	1/4 Galv. Flat Washers

Soil Sample Methods

Samples were collected from the upper and lower horizon from the side of a 2 foot hole in the center of the site. The samples were then transported in plastic bags, dried, and analyzed using the LaMotte Soil Analysis Kit. A Jackson County Extension Officer performed basic pH, organic matter, and nutrient tests on soil from the first horizon. A summary of results from our own analysis and the extension office analysis are given respectively in Tables 1 & 2.

Soil Testing Results

Table 1. Final Analysis of Soil Sample from Garden Plot Using LaMotte test kit

Parameter	Sample from first horizon (Depth of 12")	Sample from second horizon (Depth of 24")
pH	6.4-7.0	6.4-7.2
Humus	Low for agricultural soils	Low for agricultural soils
Nitrate-Nitrogen	10 to 20 pounds per acre	20 to 40 pounds per acre
Nitrite-Nitrogen	Less than 1 ppm	Less than 1 ppm
Ammonia Nitrogen	Very Low	Very Low
Phosphorous	150 pounds per acre available P	10 or less pounds per acre available P
Potassium	220 pounds per acre available K	400 pounds per acre available K
Aluminum	Very Low	Very Low
Calcium	150 ppm	700 ppm
Chloride	Less than 25 ppm	100 ppm
Ferric Iron	Less than 5 lb/acre	Less than 5 lb/acre
Magnesium	Medium	Medium
Manganese	<Low	<Low
Sulfate	50 ppm	50 ppm or less

Table 2. Soil test results from Jackson County Extension Office

Test	Results
Soil Reaction (pH)	7.0
Nitrogen	Trace or Very Low
Phosphorous	High +100 lbs/acre
Potash	Very High +200 lbs/acre
Organic Matter	3.5 %

Soil Testing Analysis

Examination of our soil test results allows us to consider several actions to improve our soil. While the organic matter content of the soil is moderate (3.5 %), we will try to build the organic matter content in the soil to further improve the soil structure and provide nutrients. The addition of vermicompost is planned, and other additions may also be considered. In particular, a green manure to improve nitrogen availability may be considered. Since nitrogen levels are relatively low, blood meal, canola meal or fish powder could also be applied (Organic Gardening Guru). Phosphorous levels in the first horizon are adequate, but this nutrient may need to be supplemented if the second horizon is also used. Sources of phosphorous include bone meal, rock phosphate or manure (Organic Gardening Guru). We may also wish to induce slightly acidic soil conditions to improve micronutrient availability (such as ferric iron and manganese) and to improve soil conditions for some of the proposed crops (such as potatoes). This soil analysis provides a basis for initial garden planning and further research.

Acknowledgements

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