

CCAT Raised Garden Beds

From Appropedia

Background

The (Campus Center for Appropriate Technology) CCAT recently changed houses, moving from the Jenkins House (which was temporary housing given to CCAT by Humboldt State University) to the Buck House. CCAT

Contents

- 1 Background
- 2 Description of Opportunity
- 3 Criteria
- 4 Literature Review
 - 4.1 Garden Bed Basics
 - 4.2 Advantages of Raised Garden Beds
 - 4.3 Garden Bed Concerns
 - 4.4 Types of Garden Beds
 - 4.5 Size of Garden Beds
 - 4.6 Constructing Raised Garden Bed
- 5 Materials

14/10/2011

was forced to destroy the Jenkins house, thus leaving CCAT with a huge empty plot of land. CCAT has allocated this land for appropriate technologies to be constructed. Unfortunately, since the foundation of the Buck house was destroyed, the soil

is no suitable for garden use, due to the high percentage of toxic chemical residue left over by the Buck house. This meant that to turn the space into a garden would be impossible, unless they found a sustainable way to build garden beds. The garden beds would serve as a solution since plants would be growing in controlled beds of soil, instead of soil with toxic in it. Also the site in which the house used to be on, has soil which contains too much clay to grow food in it. By building garden beds and growing within a controlled

CCAT Raised Garden Beds - Appropedi...

- 6 Budget
- 7 Design
- 8 Construction
- 9 How "Appropriate" was this ENGR305 project
 - 9.1 Cost
 - 9.2 Local
 - 9.3 Use of Recycled Materials
- 10 Trouble!!!
- 11 Special Thanks
- 12 Notes

environment will make the plants grow healthier and also will prevent toxic chemicals from leaching their way into whatever will be grown in the beds.

Description of Opportunity

The opportunity I have taken on for my project is building garden beds for CCAT. CCAT is interested in having garden beds built in their front lawn. This is because they want to use the land as efficiently as they can. The toxic soil presents it's self with a little bit of a challenge, since my goal is to make sure that none of the toxins in the soil leak their way into whatever is growing in the beds.



Criteria

- **Cost**- How expensive the project will be, making sure it cost within a reasonable budget agreed upon by my client and I.
- **Aesthetics**- How the project looks when it is finished. My client wants it too look nice and fit well with other structures at CCAT
- **Reusable resources used**- Part of the appropriateness of my project will be the materials I use to complete this project.
- **Mobility**- My client has asked that the garden beds be mobile, so that if they ever have to move them they can.
- **Companion planting**- Once the

- garden beds are installed, my client has asked I plant companion plants in the garden beds to utilize space and make the beds more manageable for CCAT employees.
- **Rotational Crops**- Rotational crops will be planted so the soil will stay nutrient for many seasons. This is in hopes, CCAT will get the most out of the soil I choose to put in the beds.
 - **Local**- Almost all the materials must be bought locally, this is because supporting local business helps keep money in the community, thus sustaining the locally community. This is very important to my client.
 - **Time management**- The project must be done with a reasonable time bracket. Since planting season starts early-mid march, the garden beds must be built by the end of Humboldt State Spring semester mid semester break, which is March, 19, 2008. This will allow time for planting to start and hopefully artistic expression to take place.
 - **Artistic Expression**- CCAT has asked that the beds have some artistic expression to them to add to the aesthetics of the project.
 - **Size**- The beds must fit within the space allocated by CCAT. CCAT is in the process of building many things in a small space, the garden beds must fully utilize the space provided, along with being accessible and workable by CCAT community and employees.

- **Creating a garden bench-** CCAT would like the sides of the beds to be incorporated in to some kind of sitting area so visitors to CCAT can enjoy the gardens.
- **Appropriateness** - The project must present it's self as an appropriate technology, fitting into all the previous listed criteria.

Literature Review

Garden Bed Basics

Garden Beds are raised beds that provide a control environment for crops to grow. Raised Beds are rather simple to assemble, but if used efficiently can help maintain a weed-free garden all year round. Garden Beds, unlike conventional row gardening, can be less labor intensive, easier to maintain and can use garden space more effectively. They can also allow you to grow a diversity of different varieties of plants in a smaller space. For garden beds to be successful, special planting techniques must be understood, such as companion planting, crop rotation, succession planting and interplanting. Soil compaction occurs from walking in the garden, garden beds can be a solution to soil compaction and promote better

drainage.

[1]

Advantages of Raised Garden Beds

- **Better Drainage** Building Garden Beds is an optimal choice for individuals who have poor soil quality or compacted soil. The soil within the beds can be controlled, thus improving soil structure, drainage and nutrient-holding capacity.
- **Higher Yields** Plants will be able to have better root growth from the rich nutrients in controlled soil beds. Intensive planting means more plants can be grown in Raised Beds, then in traditional row-planting.
- **Expanded Growing Season** Better Drainage allows the soil to become warmer faster, thus allowing the gardener to plant earlier and harvest earlier. This increases the length of the growing season.

- **Maintenance** Due to the controlled environment in which the plants are being grown and the fact they are being grown in raised soil beds, decreases the amount of weeds and other unwanted plants. This makes maintaining them a lot easier than a traditional garden.
- **Using Difficult Site** Garden Beds can be placed on any type of soil, this makes them optimal for any site that you traditionally you may not be able to plant in.

[2]

Garden Bed Concerns

When deciding where to build a garden bed, one of the most basic concerns is how much sun is the bed going to get and at what time of day will the bed receive the most sunlight. The best spot to put a garden is in a somewhere that receives at least 6 hours of sunlight a day, preferably 8. It is also important to consider nearby trees a concern when deciding the spot of your garden bed. Over time trees will grow, thus increasing the area

they provide shade too. It is important to put your garden beds somewhere, where there are not a lot of trees to avoid this issue. Soil is also another main factor in the final quality and quantity of what you produce in your garden beds.

[3]

Types of Garden Beds

There are three different types of garden beds. They include ground bed, raised beds and containers.

■ Ground Bed

Ground Beds are bed that place below the ground surface. For these beds there may be signs of a surface or edge surrounding the bed, but the bed it's self does not go higher than the grounds surface. These systems usually rely on existing soil, although soil amendments such as compost and different types of fertilizers can be added to benefit the soil quality. These beds do not exceed 3 feet, so whoever is working on them does not have to step into the bed. This will help avoid soil compaction. Benefits to

these beds include, low cost, no imported materials or soil, easy to build, makes good use of resources that are already there. The cons to a ground bed are that you need to find a plot and it might be hard to keep out gophers and other small underground animals.

■ **Raised Beds**

Raised Beds often times sit on top of the soil and there surface is often 2 to 3 feet above the surface of the soil. These beds are typically made out of nontoxic materials such as rock, stone, cider, blocks, bricks, untreated wood and fiber glass. These beds are optimal because you can plant earlier, due to the fact they retain heat much quicker then ground soil and you can grow longer. These beds are beneficial in places with poor soil; the edges can be used as a seating area. They can also be a good place to grow invasive species such as horseradish and mint.

■ **Containers**

Containers can be used indoors or outdoors and come in a variety of different sizes. Containers should be build out of breathable materials and have proper drainage. Containers use a special mixture, instead of just regular soil. There are numerous ways to obtain the proper soil for

containers or you can make your own out of 1/3 compost, 1/3 coco pith, 1/3 horticulture sand. The pros to having containers are can be used on top of asphalt or where there is no soil, can be placed pretty much anywhere, and in on wheels can be moved from outdoors to indoors for convince, can be wheelchair accessible and are good for areas with small space. The cons to containers are they can be costly, require special soil and containers need to be water and fertilized more often than ingrown bed and raised beds.

Size of Garden Beds

When building a garden bed, one of the most important things to take in to consideration is the size and dimension of the garden bed. Beds should be no wider than 4 ft. This is so the gardener can have easy accessibility to both sides of the bed when gardening. The beds should be no higher than 3 feet, so they are easy to garden in.

Constructing Raised Garden Bed

1. Lay out the Perimeter of your garden bed, so that you can determine the appropriate dimensions of each bed and how they will fit within the

landscape you wish to place them in.

2. Remove existing vegetation, this can be done by putting a clear sheet of plastic over the plot in which you desire to plant. This can also be done by excessive tilling, although clear plastic works much better at killing unwanted weeds and pest.
3. Level the land in which you plan to build the bed on so when build your beds, they are built on a flat surface or at a desired sloped, depending on the surface in which you intend to build. Level each piece of timber as it is put in place.
4. If the structure is permanent, secure the first few pieces of lumber you put down but driving a piece of rebar into pre-drilled holes and into the ground at a 20 degree angle. Continuously do this for the rest of the timber put in place to make sure the structure is sound.
5. Install an irrigation system to ensure proper drainage. This should be done before soil is added to beds.
6. Before adding soil, make sure to install a weed barrier, to keep out unwanted weeds such as burdmudagrass. This should be placed between the edging and the soil.
7. Add Soil. Soil should not be too sandy as it will not hold water well. An optimum mixture of soil includes sandy clay loom soil mixed with peat

moss, composted manure and sawdust or ground bark.

[4]

Materials

- 2 lbs. Nails
- 2 lbs. Screws
- 133 ft. 2X4' 2X8' Garden Grade Redwood
- 14 ft. Douglas Fir 2X4X8'
- 6 ft. Douglas Fir 2X4X10'
- 60ft. Redwood 2X8'
- Electric Drill
- Hammer
- Pencil
- Ruler
- Clamps
- Wood saw
- Gravel
- Potting Soil

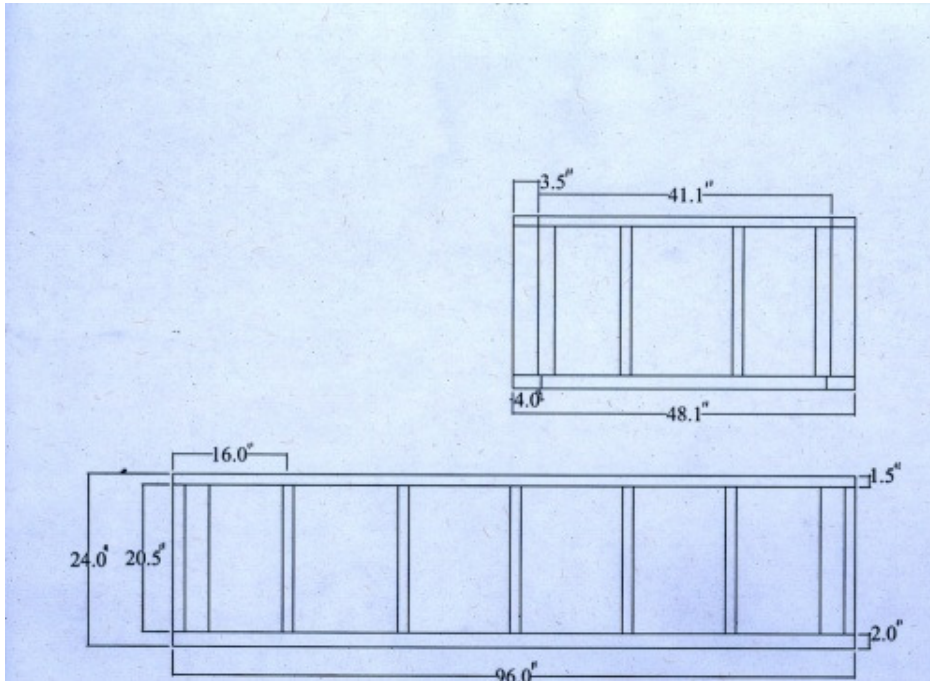
- Boiled Linseed Oil

Budget

Qty	Item	Cost	Total
133 ft.	Redwood 2X4 & 2X8 Garden Grade	\$0.50 sq/ft	\$66.50
1 Truck Load	Medium Grade Gravel	\$20.00	\$20.00
14 ft.	Douglas Fir 2X4X8'	\$2.85 sq/ft.	\$39.90
6 ft.	Douglas Fir 2X4X10'	\$4.20 sq/ft.	\$25.20
6ft.	Garden Grade Redwood 2X4X8'	\$2.67 sq/ft.	\$16.02
2 lbs.	16d Galv. Nails	\$1.46 lb.	\$2.92 lb.
2 lbs.	Screws	Donate	Free
32 bags.	Potting Soil	Donate	Free
60ft.	Redwood 2x8'	\$4.07sq/ft.	\$244.53
1 gallon	Boiled Linseed Oil	\$20.00 gal.	\$20.00
		Total	\$445.98

Design

This is a rough version of the basic design we used for the frame of the beds. Once the bed's frame was built 1"x8" was used to side the frame.



Construction



Fig. 0: The site before we started construction on it. Kind of boring eh?



Fig. 1: This is the beginning of building the base for our frame.



Fig. 2: This is a picture of the land we built the beds on. We laid down cardboard to serve as a barrier between the soil in the beds and the ground soil. This will help prevent weeds from



Fig. 3 This is a picture of the land we built the beds on. We laid down cardboard to serve as a barrier between the soil in the beds and the ground soil. This will help prevent weeds from

growing up
into the beds.

- 1.** The first thing we did was locate a spot in which would be appropriate to place the Garden Beds. CCAT had an idea of where they wanted them, so they flagged off 2 4x8 ft. plots for us to start construction.
- 2.** We then used a garden hoe, to excavate the land and made it flat, so we could begin construction.
- 3.** We laid down a layer of cardboard (which will desolve in the soil) to serve as a barrier between the soil in the beds and the ground soil. This will help prevent any weed seeds that were in the the ground soil from growing up into the soil we place in the beds.
- 4.** We then began construction!!!!





Fig. 4: Here is what the frames look like while being assembled.

Fig. 5: This is what the frame of the Garden Beds looked like before we put on the siding.



Fig. 6: This is us pre-drilling holes into the wood that was used for the frame.

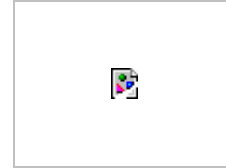


Fig. 7 : Before we pre-drilled we measured all the alignments.

5. After we assembled the frame, we began to side the exterior of the bed. This was done with garden grade redwood. We used screws to hold the pieces of redwood in place, this is so that if CCAT ever has to take apart the beds they can do so without destroying the wood.

6. The next step was placing a top on the beds. Since the garden grade redwood was really rough and CCAT wanted people to be able to use the beds as a place to sit, We purchased some nicer grade redwood for the top of the bed.



Fig. 8: : Here is what the frames look like while being assembled.



Fig. 9: This is another image of us putting the siding on the beds using a drill.

7. We then sanded down the edges, as a safety pre-caution.

8. Gravel was added to serve a drainage barrier between the soil in the beds and the top soil on the ground. This will help the beds drain quicker and hopefully prevent puddling from happening around the beds.

9. We then varnished the beds with a coat of Linseed oil, to prevent the wood from decaying. This protective layer will help prevent damage from the rain.

10. Potting Soil, that was donated from a friend were then added to the beds.

10. It's time to Plant!!!

How "Appropriate" was this ENGR305 project

Cost

Originally we estimated the cost of the project to be over \$1000.00, but because we shop around to local stores we were able to make a deal with

Almquist Lumber in Arcata, who were very generous in donating free milling of Arcata Community Forest Redwood.

Local

All the materials used were purchased locally. Local products were chosen whenever they were a viable option. The redwood used for the siding of the beds was redwood that was sustainable farmed out of the Arcata Community Forest after a huge storm that happened during December 2006.

Use of Recycled Materials

The soil that was placed inside the beds was reused from someones previous garden. We also salvaged a whole bunch of screws out of the yurt at CCAT. The cardboard used was salvaged.

Trouble!!!

Unfortunately time was not on our side in building these garden beds.

Appropriate Materials proved hard to find and sometimes way beyond our price range. Also, building the beds took longer then we thought. Coordinating schedules was often times chaotic. Unfortunately we were not finished on time, but the project was still a success. Most of the criteria set for the project was met with the exception of time management.

A week before the creation of this appropedia page, the camera used to take the final pictures of the project was stolen and with it so were the pictures.

Special Thanks

Special Thanks to Rowan Gratz for all his handy craftsman ship and to Almquist Lumber for their donations.

Notes

1. ↑ Bartholomew, Mel. Square Foot Gardening. Emmaus, PA: Rodale Press. 1981.
2. ↑ Starbuck, Christopher J. . "Raised-Bed Gardening." March

- 2003.<http://extension.missouri.edu/explore/agguides/hort/g06985.htm> (accessed May, 6, 2008).
3. ↑ Bartholomew, Mel. Square Foot Gardening. Emmaus, PA: Rodale Press. 1981.
 4. ↑ Files, Priscilla J.. "Building a Raised Bed Garden." 30 January 2001.<http://aggie-horticulture.tamu.edu/extension/raisedbed/index.html> (accessed 5 May 2008).

Retrieved from "http://www.appropedia.org/CCAT_Raised_Garden_Beds"
Categories: Engr305 Appropriate Technology | Horticulture and gardening | Projects | CCAT

- [2 watching users]
- Page was last modified 14:08, 25 September 2010. Based on work by Chriswaterguy's bot, Roger Tuan, Chriswaterguy, Lonny Grafman and Chelsea Gazillo and others.
- Text is available under CC-BY-SA