

How to Build Your Own Bioreactor



The Johnson-Su Bioreactor method of creating compost is quite different from other composting methods in several respects. The most common commercial windrow composting processes are usually designed and operated for speed and maximum product flow. Unfortunately, this focus does not allow the compost to degrade sufficiently. It can even produce an immature compost that in some cases is detrimental to plant growth. Most home composting methods require building a pile and turning it at regular intervals. Both windrow and static pile approaches can produce undesirable smells, attract flies, and be problematic with neighbors. However—when built and maintained correctly—the Johnson-Su bioreactor never needs turning, never has smells, and does not attract flies. The material is composted aerobically which encourages a complete biological breakdown of compost materials that results in a microbially diverse, fungal-dominant product.

Normal compost is similar to mulch in consistency. The compost from Johnson-Su composting bioreactors has the consistency of clay when mature. You can actually

squeeze it like clay through your fingers. When mature this compost can be applied as an extract, used to coat seeds for planting in large farming operations, or be applied directly as a soil amendment. It improves seed germination rates when used to coat seeds, improves soil water infiltration and water retention by helping to increase soil carbon content, and increases plant health, plant growth rates, and crop production.

It is quite important to follow the instructions to do the process correctly and get the results you need.

For example, the Bioreactor is constructed specifically for stability, durability, breathability, and moisture content consistency. You don't want the material to fall apart before compost maturity which takes one year. Use woven landscaping cloth to allow enough air infiltration without drying out the composting material and all the microbes and living creatures within. There needs to be sufficient moisture level. See below for more tips!

Required Materials and Tools

To build a Johnson-Su bioreactor, you'll need some readily available materials and a few tools. Chances are you will be able to find these locally but links are provided if you cannot. Please refer to full instructions (below) to learn more.

Materials consist of

- [Landscape cloth\(opens in new window\)](#) (woven, minimum 5 oz.): Piece One: 13' x 6', Piece Two: 6' x 6', Piece Three: 6' x 6'
- One standard, sturdy [shipping pallet\(opens in new window\)](#) with dimensions of approximately 40" x 48"
- [Wire re-mesh\(opens in new window\)](#) (6" x 6" x 10-gauge wire), used to create a 5' x 12' 6" supporting wire cage. This type of remesh is normally used for reinforcing concrete. Be sure to use re-mesh as horse fencing or other similar wire fence products have insufficient vertical strength to hold the cage in position as you fill it.
- Four 10' lengths of perforated, bell-end, 4" septic system drain field piping
- [PVC glue\(opens in new window\)](#)
- [Tie wire\(opens in new window\)](#) (normally used to tie rebar together)
- Approximately 13' of $\frac{1}{2}$ " [landscape water hose\(opens in new window\)](#) for the drip irrigation system

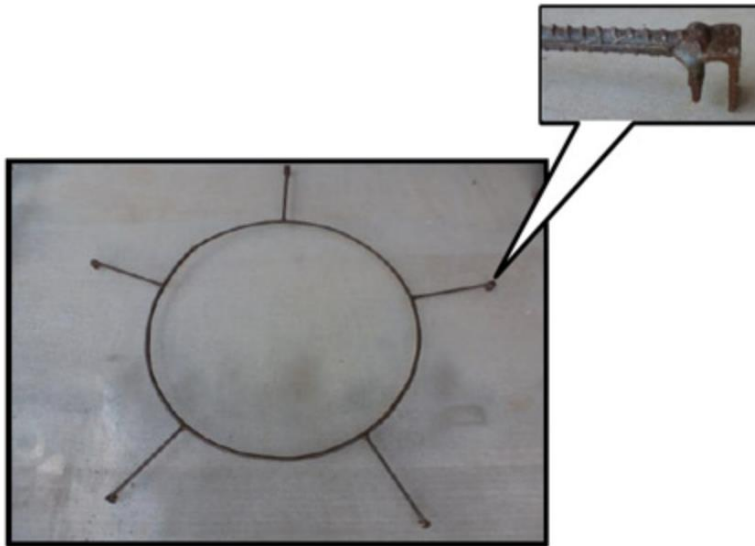


Figure 1. Rebar Jig

- Optional: A rebar jig (Figure 1 at right) to hold the drain field pipes in place as you fill the Johnson-Su bioreactor. If you have helpers or if you are willing to adjust the pipes as you fill the bioreactor, you will not need the jig.

Tools required are

- [Small bolt cutters](#)(opens in new window) or heavy pliers for cutting the wire re-mesh
- [Linesman's pliers](#)(opens in new window) to cut and tie the tie wire for assembling the cage
- [Circular saw](#)(opens in new window)
- [Jigsaw](#)(opens in new window) for cutting the holes in the pallet
- Scissors for cutting the landscape cloth
- Tape measure
- Pen or pencil to mark places that will be cut