

Building a Sub-Irrigated Raised Bed Planter

What's sub-irrigated planter (SIP)?

It's a method of watering plants where the water is introduced through the bottom of the planter. This allows the water to wick up through the growing medium, usually potting mix, by the way of capillary action. With pure physics at work, the plants get the right amount of water.

Soil usually has poor capillary action and is not an ideal medium for a SIP. Which is why potting mix, a blend of compost, peat moss, and perlite is used. Some commercial potting mix contain limestone to balance the pH value and some slow release fertilizer as plant nutrient.

The advantages of sub-irrigated gardening are many:

Needs very little space: A small space with sufficient sunlight would do nicely. It could be a rooftop, balcony, a deck, driveway, paved patio, or even a fire escape.

Needs little resources: Many popular sub-irrigated planters are made from two 5 gallon buckets (shown on top).

Needs little attention: The system is self regulating; you cannot over or under water the plant. Does not need monitoring the fertilizer level either.

More productive: SIPs will produce more food per square foot than in-ground gardening while conserving water. This is safe food production with no exposure to contaminated soil.

More eco-friendly: The buckets can be recycled from food grade oil or margarine buckets from restaurants or bakeries. They conserve water by keeping it contained in the planter. There are no fertilizer run offs into rivers and streams. The planting medium can be used for 5 growing season before composting.

The sub-irrigated raised bed planter is built on similar principle.

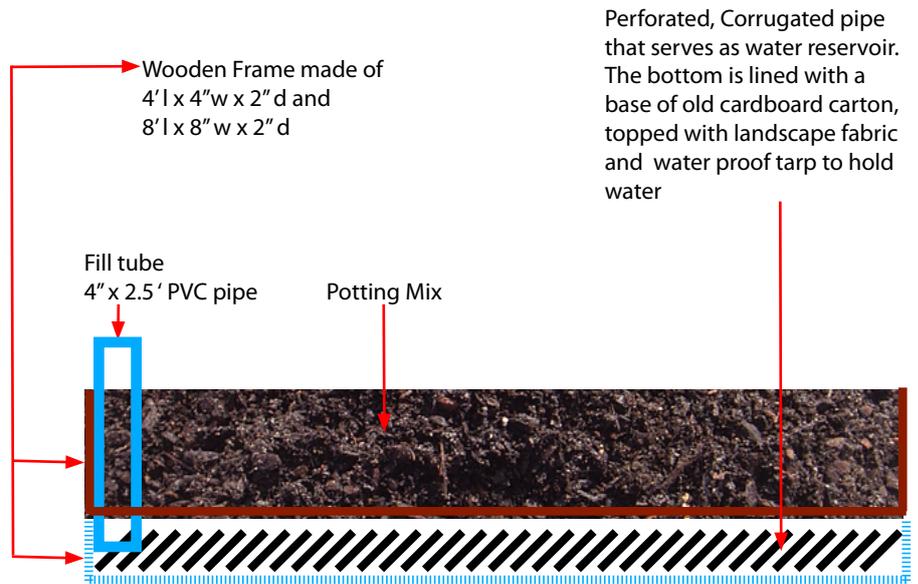


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Raised beds have always been an easy, efficient and more productive way to grow greens and vegetables. The advantages are many:

- Avoid contaminated soil
- Better water drainage
- More closely placed plants for better productivity
- Better water use
- Efficient weeds control
- Row covers for extended growing season
- Raised bed means less backbreaking work

With a sub-irrigated raised bed you get all the advantages of a raised bed plus more produce, better water and fertilizer usage, and an almost plant-and-forget convenience. So let's build one.



Planning

For a 4' x 8' bed you'll need:

- Three 8 foot long 2" x 6" (\$5.49)
- Three 8 foot long 2" x 10" (\$ 10.09)
- Good quality tarp at least 9.5' x 5' or very thick plastic sheet
- One 4" x 2.5' PVC pipe (4" x 5' precut piece \$13.58)
- Wood screws
- Landscape fabric (4 ft x 100 ft (\$39.98)
- Potting Mix (**not potting soil**. 27 cu. ft. cost me \$100)
- 9 Perforated corrugated pipe 4" x 10' (\$ 5.95)
- Hardware mesh (ideally 1/4" mesh)
- Screws and nails

Total cost was about \$225. Potting mix being the most expensive component. You can use the potting mix for about 5 growing seasons before composting it.

With a table saw or power saw, cut one 2 by 10 and one 2 by 6 in half. So in all you will now have: two 8 foot long 2 by 10, two 4 foot long 2 by 10, two 8 foot long 2 by 6 and two 4 foot long 2 by 6. Most big box stores will make one or two cuts for free.

Pick a spot where you want the raised bed to go. Ideally, a well lit place that gets a lot of sunshine.

Clean the area of stones and weeds etc. The ground under the bed should be smooth, without any projections that could

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puncture the tarp so you might want to put a layer of some old cardboard carton or a bed of newspaper to provide a layer of cushion. Now lay two layers of landscape fabric. This provides a nice cushion for the water proof tarp that will go on top and also prevent the weeds from pushing through.

If you have a lot of rabbit, mole or ground critter population in your area you might want to get some 4' x 10' roll of 1/4" mesh hardware cloth. This will prevent the critters from digging in from under your raised bed garden.



Building

Assemble the pieces on a flat, hard surface and ensure they are aligned properly. Set the 8 foot 2 by 6 on its thin side and join it with the 4 foot 2 by 6 piece. It's essentially what is called a butt joint. I used pocket screws to make the joint nice and strong.



Join the other three sides too and now you have a frame that is 8 feet x 4 feet as in the picture below.

Lay the frame on the prepared 4' x 8' bed.



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Place the waterproof tarp/plastic sheet over the frame. The sheet should be big enough for a nice overlap on all the 4 sides. Fold out the overlap so you have created a nice reservoir for the water.



Now build the second bed on top. This will be the 2" x 10" x 8' bed. Once again I used pocket screws for a strong, tight fit. I then secured the 2 bed together on all four sides. This was done on the outside some spare wood, roughly about 2" x 4" x 6" .



Side-view of the two frames on top of each other.



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The bottom bed is now lined up with 9 perforated, corrugated pipe. The pipes were 10 feet long and I cut them to the required 8 feet size. I saved the excess 2 feet pipe for making sub irrigated 25 gallon totes (see the [Sub Irrigated Totes v2 blog](#) for details)

The pipes are placed in a such a way that it creates a gap in the middle. This is crucial as this gap will help the potting mix to make contact with the water and wick it up to the roots.



The landscape fabric is laid over the pipes to prevent the potting mix from clogging the perforations in the corrugated pipe.

The 4" x 2.5' PVC fill tube was attached to one end of the corrugated pipe.



Fill the bed with potting mix. Taking care to pack the potting mix to fill the gap in the middle.



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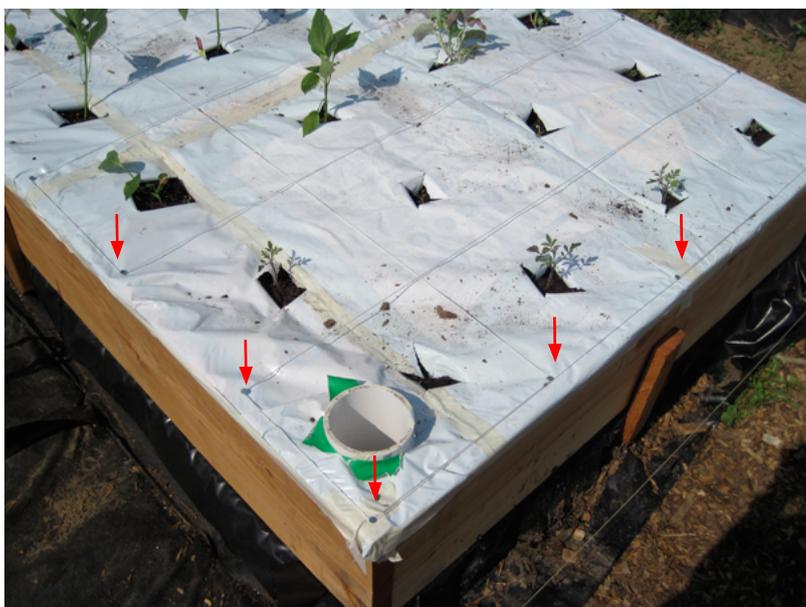
Potting mix is filled to the top. Almost ready for planting.

I took the empty potting mix bags and used it to cover the bed. This prevents rainwater from flooding the bed and also keeps the soil warm in cold weather.



Once the plastic sheets were on top, I nailed them. One nail every feet. So I had $8 \times 4 = 32$ square foot marked up. I looped the nails with nylon thread to create 32 square spaces for me to plant.

For more on square foot gardening please visit www.squarefootgardening.org



I planted tomatoes, egg plant, peppers the first season. Water directly from the top only the first time around, either when laying seeds or while transplanting. rest of the time the bed is watered through the fill tube.



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Another point of view.



The second season I planted peas and lettuce early in April.

I also used some 2" PVC pipes to create a trellis.



When it was nice and sunny I added some coriander to the mix.

If you build some row covers then you can easily extend the planting season. to grow more cold season vegetables.

