

# Sub-Irrigated Planter (SIP) Totes v2

## 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 the 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 the 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 tote planter is built on similar principle. This is version 2 that is very simple and easy to build.**





# Sub-Irrigated Planter (SIP) Totes v2

## You will need:

- One 25-gallon tote with lid
- 1 Perforated corrugated pipe 4" x 10'
- 1" diameter PVC tube 2 feet in length
- One 16 oz disposable drinking cup
- 1-2 cubic feet potting mix (**not soil**)
- Organic fertilizer (7-7-7 or 10-10-10) 2 cups
- If you are growing tomatoes you will need 1-2 cups of hydrated lime to prevent blossom end rot
- 1 Black garbage bag (optional if you don't have a lid)

## Tools:

- 3.5" hole saw
- 3/8" drill bit
- Landscape Fabric
- Scissors
- Box Cutter
- Hack saw

**Use caution when using power tools.**  
**Read the manual and always wear safety goggles.**

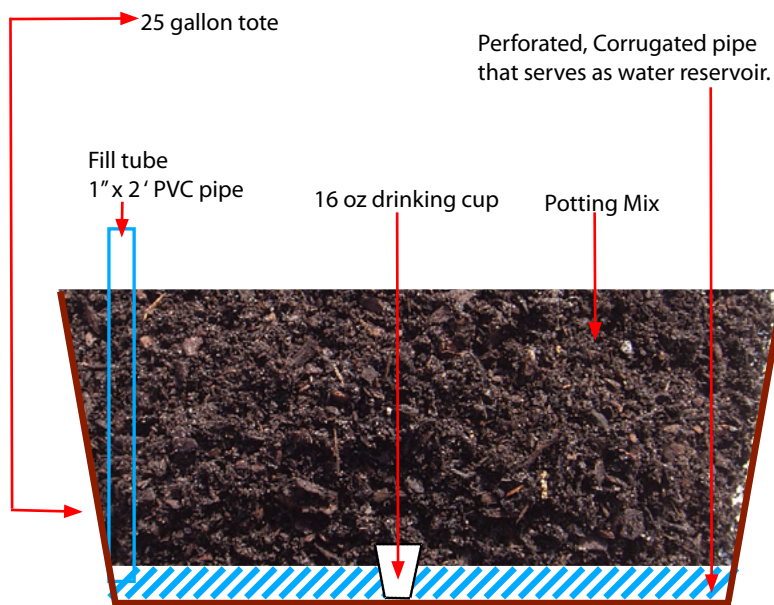
## Cost:

- \$12-15. Cheaper if the buckets are on sale.

## Procedure:

Cut the perforated corrugated pipe to fit the tote.

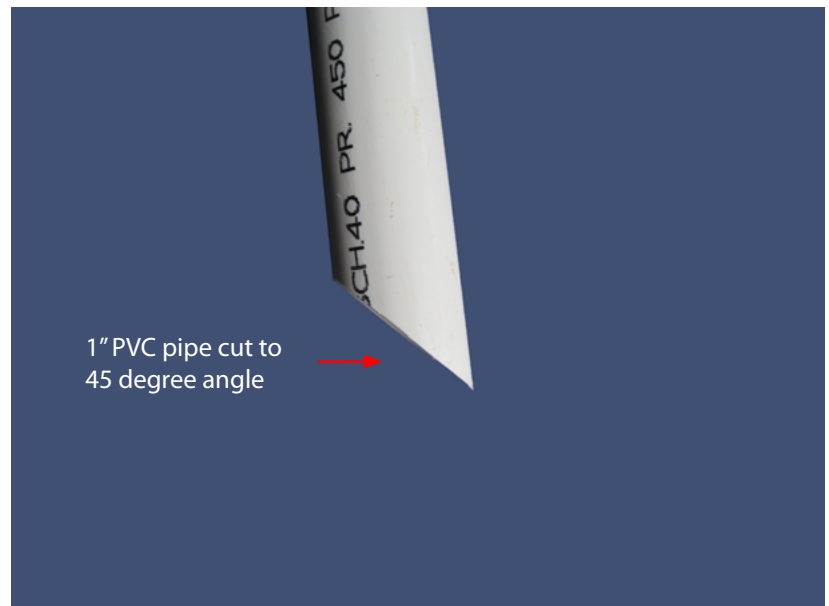
Arrange the cut pipes inside the tote. In this case it was a nice tight fit.



# Creating a Sub-Irrigated Planter (SIP)

Cut one end of the 1" PVC pipe at a 45 degree angle. A hack saw or a table saw can make a clean cut.

**This cut is vital. It prevents loose soil and debris from clogging the fill tube.**



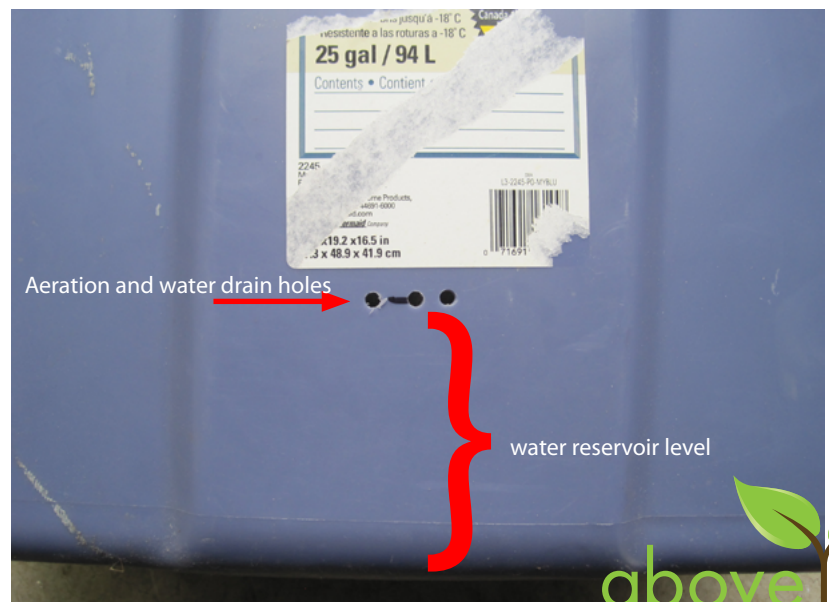
Cover the top of the corrugated pipes with landscape fabric. This prevents the potting mix from clogging the holes.

Cut a 1" hole in the perforated corrugated pipe and the landscape fabric and insert the 1" PVC pipe. Insert the 45 degree end of the pipe into the corrugated pipe through the 1" hole. This tube will act as a feed tube to fill water.



Insert 2-3 holes about 3/8" in diameter to allow for aeration and draining of excess water.

This hole should be about 3.5 inches from the bottom. The calculation being the perforated, corrugated pipe is about 4.5 inches in diameter. This gives 1" space for air that will provide aeration to the roots.





# Creating a Sub-Irrigated Planter (SIP)

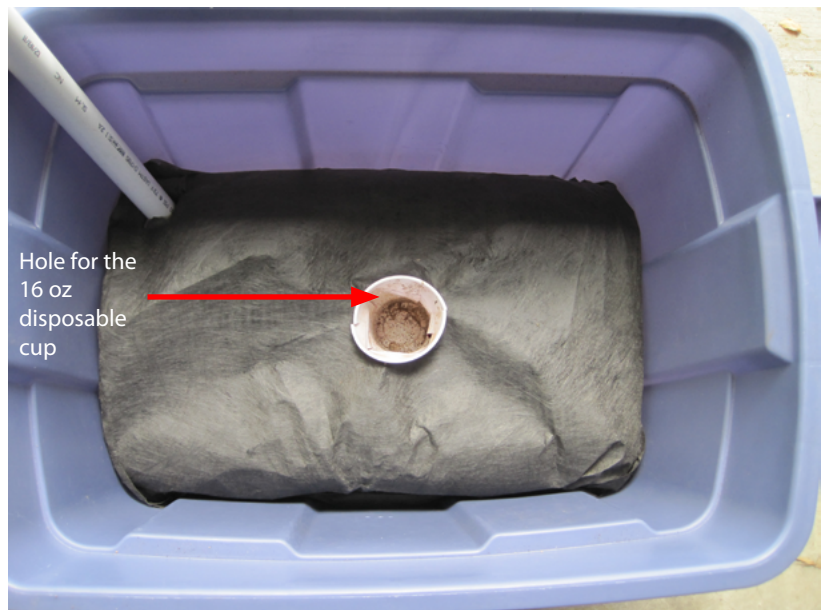
Make a hole in the corrugated pipe in the center to insert a 16 oz disposable cup. If the hole is about 3.5" then the 16 oz cup should fit snugly.

Now take the 16 oz. disposable cup and make an "X" shaped cut at the bottom.

Also make 4 vertical cuts of 3" on the side of the cup.

It is through these cuts that water will connect with the potting mix in the tote.

Insert the cup into the hole.



Wet part of the potting mix until it is a slurry. And fill the 16 oz disposable cup and the drain holes with this wet slurry of potting mix. Wetting the potting mix will help it cover the holes without falling to the bottom.



Fill to the top with potting mix. If you plan to grow tomatoes add 1-2 cups of hydrated lime when you are about half way level.

Add 2 cups of 10-10-10 fertilizer strip when you are about 2" away from the top.





# Creating a Sub-Irrigated Planter (SIP)

Add more potting mix and fill all the way to the top.



Depending on what you are going to plant make appropriate holes. In this case I made two 3.5" holes to hold eggplants.

For a more detail guide on planting instruction for Totes visit <http://goo.gl/bALCI>



Two eggplant saplings transplanted to the tote. Water directly from the top only the first time around, either when laying seeds or while transplanting. Rest of the time the tote is watered through the fill tube.



# Creating a Sub-Irrigated Planter (SIP)

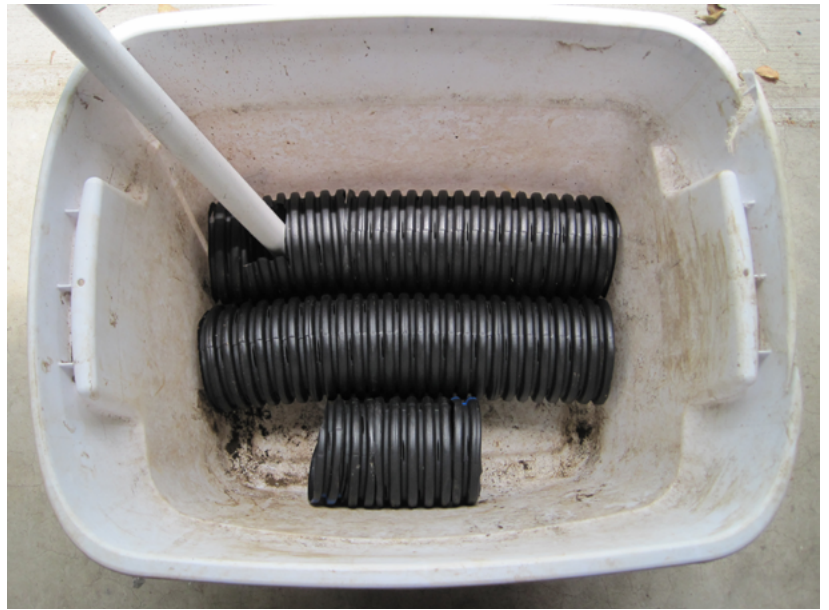
## Alternate Way.

This version does away with the need for a 16 oz disposable cup.

One of the perforated corrugated pipe is cut short so to provide space for 2 holes. It is through these two holes that water will connect with the potting mix in the tote.

Place the 1" PVC (2 feet long) tube in the 1" hole. This will act as a feed tube to fill water.

Ensure the end of the pipe that makes contact with the water is cut at 45 degree angle.



Cover the pipe with landscape fabric. This prevents the potting mix from clogging the holes.

Wet part of the potting mix until it is a slurry. And fill the two holes with this wet slurry of potting mix.



Insert 2-3 holes about 3/8" in diameter to allow for aeration and draining of excess water.

This hole should be about 3.5 inches from the bottom. The calculation being the perforated, corrugated pipe is about 4.5 inches in diameter. This gives 1" space for air that will provide aeration to the roots.





# Creating a Sub-Irrigated Planter (SIP)

When you are half way through filling the bucket spread a cup of garden lime.

You will need to do this step only if you are growing tomatoes. Garden lime helps prevent blossom end rotting that's caused by calcium deficiency.



Now continue to fill the potting mix till you reach 2" from the top of the bucket. Add 2 cups of 10-10-10 organic fertilizer in the form of a ring around the edge of the bucket or the middle depending on what you are planting. For a more detail guide on planting instruction for totes visit <http://goo.gl/bALCI>



Now, fill the tote to the top with potting mix. Once filled, cover with a plastic sheet, lid or a black garbage bag.





# Creating a Sub-Irrigated Planter (SIP)

Shown here 8 sky hot peppers I got from the farmers market.

Water directly from the top only the first time around, either when laying seeds or while transplanting. Rest of the time the tote is watered through the fill tube.



I use plastic sheets or garbage bags to cover the tote. This is handy when planting greens like spinach, kale, swiss chards etc.



Clip them on the side to hold it securely.

