Building a Sub-Irrigated Planter (SIP) with Totes

You will need:

One 18 gallon storage tote with lid
Expanded polystyrene foam (EPS foam) (available at any big box store)
Potting Mix
1" diameter PVC tube 2 feet in length
10-10-10 organic fertilizer
Garden Lime if you are planting tomatoes

Tools:

Box cutter or hot knife to cut the EPS foam (Search for foam hot knife on ebay)
3.5" and 2" hole saw
Soldering iron

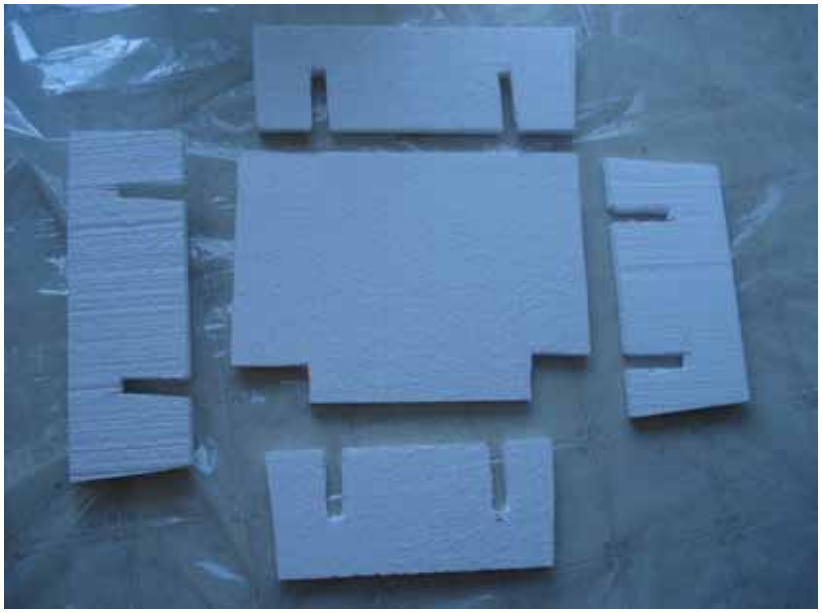
Use caution when using power tools. Read the manual and always wear safety goggles.

Cost:

- $12. Cheaper if the totes are on sale.

Procedure:

Cut the EPS foam with a sharp box cutter or a hot knife. You will need 2 long strips that fit the length of the tote (roughly 18.5" or 47 cms) and 2 short strips (roughly 13.78" or 35 cms) the width of the tote. The height if 6" or 15.2 cms).



Once you have the strips cut out, you will have to angle the sides to fit them into the tote. The 2 cuts you see in the middle of the foam strips are 3 inches long (or half the height of the strip, and is cut to the thickness of the foam (3/4" or 1.7 cms)

The centre piece is cut to fit roughly into the tote. It's a trial and error method and you have to keep at it till it fits into the tote and snugly rests on the foam grid you created.

Once you have them all cut, you can make a template out of cardboard and then you are set. As long as you get the same 18 gallon tote you can cut all your foam using the template.

Creating a Sub-Irrigated Planter (SIP)

Now place the foam grids as shown and this will form the base.

Take the 1" PVC tube (2 feet in length) and make a cut as shown.

Place the center foam piece and punch a 1" hole on top and place the PVC tube.
Now would be a great time to heat up the soldering iron and make 30-40 1/4" holes. These will act both as drain holes to drain excess water (from rain for instance that might come through the top) and as aeration holes for the root to breathe.

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Now it's time to start filling the tote with Potting Mix (this system won't work with soil). Before you start, drill two 1/4" holes on the outside of the tote (see picture in the next page). These will serve as drain holes. The holes should be on the opposite side of the PVC watering tube. The holes are placed in the center of the tote, at a height of about 5 inches from the bottom of the tote.

Since the foam grid is 6" tall and the drain hole is 5" high, this leaves an inch for air. This air will enter the root system through the aeration holes in the foam.

Wet the potting mix and start filling the holes on the two sides as shown.

Fill 3/4th of the way to the top. At this point if you are using the tote for growing tomatoes, add 2 cups of garden lime evenly on top of the potting mix.

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When you are about 2" from the top add 2 cups of 10-10-10 organic fertilizer. Fill to the top of the tote with more potting mix. It's OK to cover the fertilizer strip

If you just planting 2 tomatoes you will have to place the fertilizer strip on the end across from the PVC tube.

If you are growing peppers, cucumbers, zucchinis, cabbage or broccoli you can place the 2 cups of fertilizer as a strip in the center of the bucket. Make sure you fill with potting mix to the top and cover the fertilizer strip.

This will allow you to place 4 plants on either side.

Shown here is 2 holes for tomatoes or egg plants. The holes are drilled to the lid of the tote using a 3.5" hole saw.

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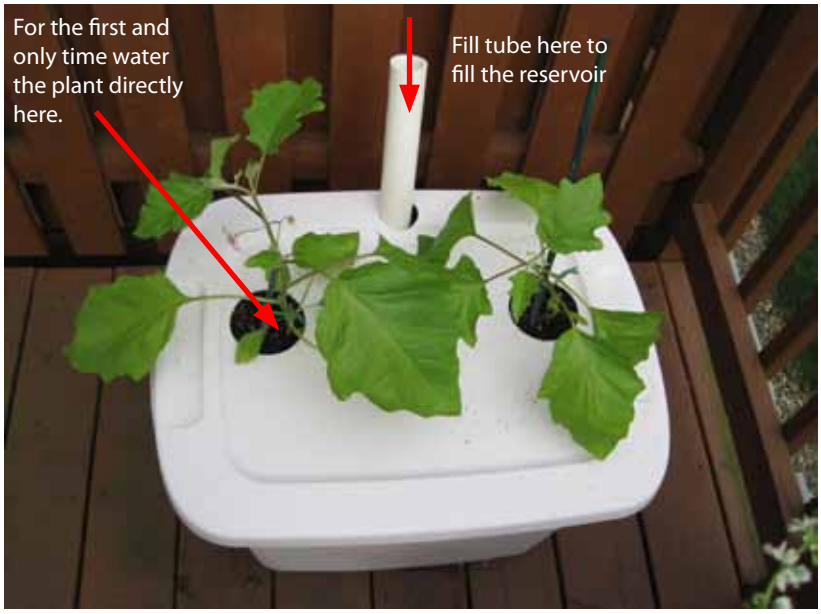
Here's the tote with 2 eggplants. Just for the first time, when you transfer the plants from pots to the tote make sure you water them from the top. Rest of the time always fill water using the filling tube.



Shown here is the 2 x 4 formation with 8 cabbage plants. The 8 holes were drilled using a 2" hole saw.

Shown here 2 tomato plants with cage fixed right into the tote.