

Pot-in-Pot System: A Container-Grown-in-the-Ground Approach for Diverse Crops

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In the pot-in-pot (PIP) system, essentially a containerized plant is placed into a socket pot that is permanently buried in the soil. The plant grown in this manner can simply be harvested by lifting it out of the permanently buried pot. These plants will require irrigation during the active growth period and sufficient site drainage. In many regions of the United States, the expensive cost of providing overwintering structures is eliminated using this principle. The PIP method is an effective means to grow 3- to 20-gal containerized trees, evergreens, and deciduous shrubs.

Installation of a PIP growing area is not very complicated process. First determine items to be grown, the size container and the row spacing for the items. Select a site that is suitable for the crop. The site should have available water source and can be sloped or relatively flat. If drain tiles are to be installed stony ground may make trenching rather difficult. We grow all of our PIP items in bed configuration sites. Our rows are either 200 or 300 ft long, depending on the site; the beds are 24 ft wide providing for either 10 or 20 rows per bed. The base site is either shallowly rotivated or disked to flatter the uneven high spots. After leveling the site, we measure and mark row spacing. We are obsessive about row straightness and use a string line to guide the walk-behind trencher. The trench is approximately 5 inches wide and 4 inches deeper than the selected socket pot. Next, the 4-inch drainpipe is placed in the trench. We then use shovels to widen the spots for each of the socket pots. The pots are placed and back filled before we move to the next row. When all rows are set we spread the excess soil throughout the site (allow for some settling overtop of the drain tile). We generally allow the loosened soil to setup before we install the weed barrier. Rainfall or overhead irrigation will help compress the soil around the pots. To install the weed barrier we pin it in place right over the entire bed site. We then use a razor knife to cut an X over top of the socket pot. Next we lift the pot from the soil and through the hole in the weed barrier. This allows us to tuck the flaps of barrier down in the hole and the pot is then replaced anchoring the weed barrier tightly to the soil. After securing the weed barrier, we install the irrigation system. We use either inline drip irrigation system or overhead impulse type sprinklers. Basically the PIP area is then ready for use.

ADVANTAGES VS. DISADVANTAGES OF PIP SYSTEM

Advantages.

- Root zone insulation from extreme temperature variations
- Reduction of water usage.
- Suitable for trickle applications.
- Elimination of blow-down problem.
- Year-round harvest ability.
- A “neighbor friendly” system.
- Less capital intensive, construction, and maintenance reduction.

Disadvantages.

- 1) Lack of flexibility in spacing.
- 2) Initial labor-intensive set up.
- 3) Exposure to winter winds.
- 4) All plant care performed outdoors.
- 5) Container-grown plants rooting into soil.
- 6) Heavy-soil type limitations.

CHARACTERISTICS FOR CROP SELECTION

- 1) Deciduous shrub, conifer, or selective evergreen shrubs with desiccation-resistant foliage.
- 2) Upright or semi-upright growth habit.
- 3) Fibrous root structure.
- 4) Hardiness zone fit.

ITEMS SUCCESSFULLY GROWN

Rhododendron (azalea-deciduous)
*Buddleja**
Caryopteris
Chamaecyparis
*Cornus**
*Forsythia**
 ornamental grasses
Hibiscus (althea)
Hydrangea
Ilex

Itea
Juniperus
Microbiota decussata
Pinus
Potentilla
Prunus
Rhododendron
Spiraea
Syringa
Weigela

*Items have aggressive rooting characteristics and require copper coated barrier to minimize root anchoring.

COSTS**Anticipated Setup Costs.**

- 1) Container cost:

3 gal injection mold	\$.64 each
5-gal "seconds"	\$.49 each
- 2) Equipment rental:

ditch-witch trencher	\$140.00 per day
gravely mounted auger	\$85.00 per day
- 3) 4-inch ADS drain pipe 100 ft⁻¹:

\$25.60 per roll

- 4) Weed barrier 7500 ft² at \$0.05 per ft²

\$363.40

- 5) Bark mulch yard³

\$4.00 to \$10.00

- 6) Labor 236 h for 942 containers complete with drainage, irrigation, weed barrier, and mulch
- 7) Spray stakes 3.2 gph

\$0.47 each

- 8) Weed check sheets (3-year life)

\$0.44 each

Container Sizes.

- 3-gal poly-tainer 3A and classic 1000.
- 5-gal poly-tainer 7S and classic 2800.
- 15-gal poly-tainer 15S and classic 4000.

These containers provide nice nesting configuration with the liner pot sitting at the bottom of the socket pot. Several pot manufacturers provide information matching liner pot and socket pot sizes for PIP installations.

ACTUAL COSTS

For 22 ft × 200 ft = 4400 ft² site (1000 containers) \$4704.09 or \$0.86 per ft².

Comparative site with a poly structure would cost \$6909.40 or \$1.21 to \$1.45 per ft² with additional yearly expenses of \$338.00 for new poly recovering and general repair.

CONCLUSION

I believe that PIP does provide an economical and viable option to maximize production space beyond the normal scope of expanding structure-covered sites.