

## Root Plug Method for the Propagation of Root Cuttings Using Commercially Available Trays<sup>®</sup>

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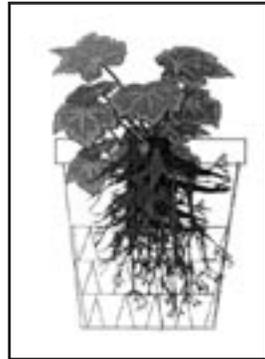
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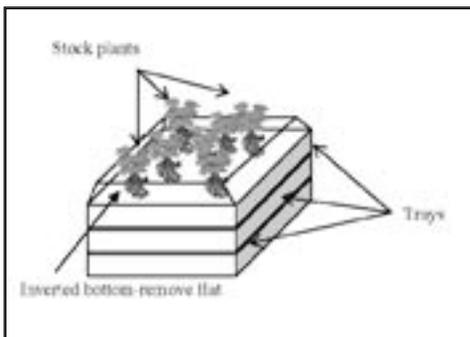
### BACKGROUND

A root plug is a root cutting that regenerates from a stock plant that has been grown in a container subdivided by compartments such as plug trays. The goal of our research was to develop this root-plug method with commercially available materials.

*Anemone ×hybrida* 'September Charm', *A. ×hybrida* 'Honorine Jobert', *Eryngium amethystinum*, *Oenothera fruticosa* 'Youngii', *Stokesia laevis* 'Blue Danube', and *S. laevis* 'Mary Gregory' were tested in the following treatments: 200-cell, air-pruning tray (International Innovative Technology, Inc, Ridge, North Carolina U.S.A.), 128, 162, and 288 trays (Winstrip, Inc., Fletcher, North Carolina U.S.A.), 4-inch square pot (Belden Plastics, Roseville, Minnesota, U.S.A.) with three cut-to-fit 243-X-cut trays (Blackmore, Belleville, Michigan, U.S.A.), and 4-inch square pot (Belden Plastics, Roseville, Minnesota, U.S.A.) as control for the X-cut trays. All trays were filled with a commercial mix (Fafard 3B, Agawam, Massachusetts, U.S.A.) and all trays except the X-cut tray



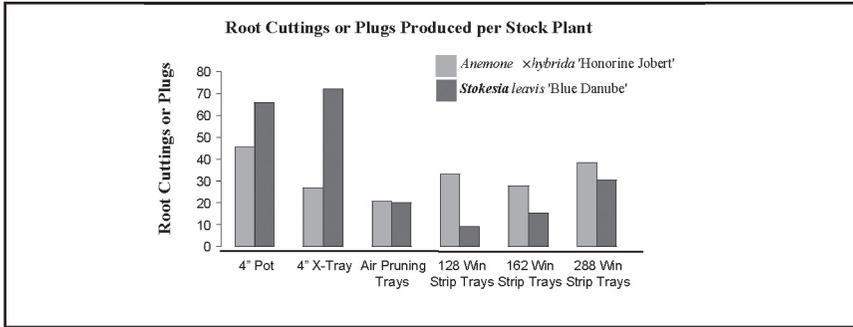
**Figure 1.** Three stack method for the propagation of root pugs using cut to fit 243-X-cut trays inside a square pot.



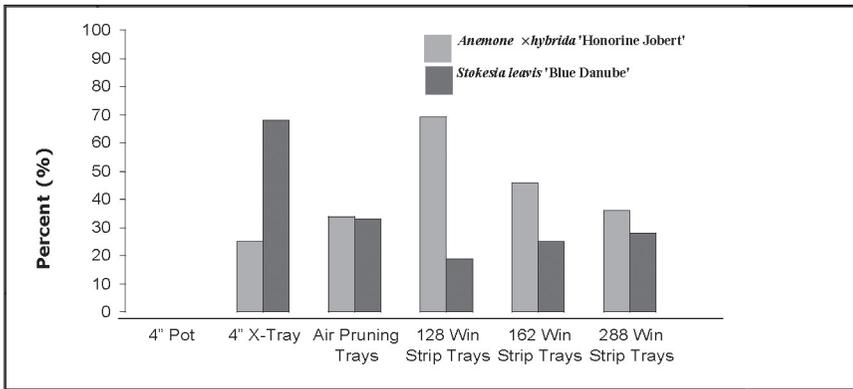
**Figure 2.** Three stack method for propagation of root pugs with inverted bottom-removed flat to hold soil for stock plants.

(Fig. 1) were stacked three trays high with an inverted flat tray (bottom-removed) placed on top of the trays to support the soil. Eight stock plants were planted in each tray (Fig. 2).

After 6 months of growth from transplant (4 Jan. 2003), the stacked plug trays were separated with a sharp knife. The trays were placed on a mist bench for root-bud regeneration. The number of plugs that contained regenerated plants was counted after 5 weeks.



**Figure 3.** Quantity of root cuttings or plugs produced per stock plant grown under different treatments for *Anemone x hybrida* 'Honorine Jobert' and *Stokesia leavis* 'Blue Danube'.



**Figure 4.** Percentage of cells that produced a root plug grown under different treatments for *Anemone x hybrida* 'Honorine Jobert' and *Stokesia leavis* 'Blue Danube'.

## RESULTS AND DISCUSSION

*Anemone* yield was greatest by cutting "soil pads" from the 4-inch pot and manually separating regenerated shoots (Fig. 3). For *Anemone*, all Winstrip trays had relatively high percentage of cells filled with root plugs (Fig. 4) however, root plugs could not be pulled from the cells due to root growth occurring between cells. *Stokesia* stock plants produced the highest yield (72 root-plugs per stock plant) and the highest percent fill (68%) in the X-tray treatment (Figs. 3 and 4). An alternative method for *Stokesia* propagation can be done by "scooping" the main crown and allowing cuttings to regenerate.

*Acanthus* thick roots and low regeneration percentage (seven cutting per pot) makes it unsuitable for this procedure. *Oenothera* and *Eryngium* did not produce a sufficiently well-developed root system to produce root plugs.

The root-plug method works well with species that have fibrous root systems and are prolific root-bud producers. The benefits of the root-plug method are limited when compared to simply cutting soil pads from a mature plant/root system. The air-pruning tray had the best root-plug size, root plugs were the easiest to remove from the trays, and the trays were relatively easy to build. The labor and supplies required to build the root-plug trays is probably equal or greater the labor spent separating root cuttings from a pad system.