Increased Rooting Percentages and Decreased Transplant Shock Using Ellepots©

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INTRODUCTION

Spring Meadow Nursery is a liner producer of a wide range of woody shrubs, both deciduous and evergreen. Softwood and hardwood cuttings are either direct rooted into a 2¼ or 4-inch cell or rooted in a 72- or 98-cell tray and then transplanted after rooting. Plants that are more difficult to root are first rooted in a plug tray and then transplanted to avoid wasted space and material. We often experienced transplant loss when shifting from plugs into 2¼ or 4-inch pots. Another challenge was shortening the cycle on plants that were slow to root into the transplant media from a plug. When researching options to both increase rooting percentages and reduce plant loss upon transplanting, we trialed several options: Oasis WEDGE® System, Jiffy-7® Forestry Pellet, and Ellepots. We found that Ellepots, distributed by Blackmore Company Inc. in Belleville, Michigan, best fulfilled our requirements for achieving the above goals.

MATERIALS AND METHODS

Low Rooting Taxa Trialed. *Amelanchier canadensis* and *A. alnifolia, Rosa* (shrub taxa), *Rhus aromatica* 'Gro-low', *and Thuja occidentalis* 'Nigra' (syn.'Nigra Dark Green').

Excessive Transplant Loss and/or Taxa Slow to Root into Media. *Abelia* × *grandiflora* cultivars, *Andromeda polifolia* 'Blue Ice', *Cotoneaster apiculatus* and *C. horizontalis, Euonymus alatus* cultivars, *E. fortunei* cultivars, *Genista lydia*, *Hypericum kalmianum* cultivars, *Kerria japonica* 'Picta', and *Rosa* cultivars.

Ellepots. We purchase Ellepots in 35 mm and 25 mm sizes, preloaded into 84- and 105-carrier trays, respectively. Ellepots are made of Greenway Ellepot Mix composed of peat with 18% perlite and Aqua-Gro wetting agent but no starter fertilizer charge. The medium is filled into an Ellepot woven polyester sleeve via adjustable vacuum. The sleeve is root, air, and water permeable. According to the literature, this sleeve will break down in approximately 3 months. The filled trays arrive on pallets, wrapped securely in plastic. The trays remain encased in the plastic until they are used because the medium dries very quickly if exposed to air and becomes very hard. It is almost impossible to insert a softwood cutting into a dried out Ellepot.

Our medium for plug cells is composed of 4 peat moss : 1 perlite (v/v) prepared in a Bouldin & Lawson mix maker. The medium is slightly moistened with water containing 600 ppm Aqua Gro L. The medium is carried to a Bouldin & Lawson Model 131 flat-filler system and 98- or 72-plug trays are filled.

Both the Ellepot and our medium-filled trays are handled in the same manner from this point on. The trays are stuck with cuttings, pass through a watering tunnel, and are placed in a Q-Com environmental computer-controlled greenhouse on a cement, heated floor outfitted with GTI traveling irrigators. Ellepots and flats containing our medium are rooted side by side in the greenhouse.

Table 1. Camparison of rooting in our medium and Ellepots.

Plant	Rooting 2000 and 2001 our media (%)	Rooting 2003 Ellepot (%)
Amelanchier alnifolia 'Regent'	35	71
Amelanchier canadensis 'Rainbow Pillar'	13	60
Genista lydia	50	82
Rhus aromatica 'Gro-low'	33	79
Rosa 'Chuckles'	43	82
Rosa 'Nearly Wild'	35	89

Table 2. Plant taxa with lower rooting percentages in Ellepots than in our medium.

Plant	Rooting our medium (%)	Rooting Ellepots (%)
Berberis thunbergii 'Crimson Pygmy	69	32
Thuja occidentalis 'Nigra'	70	38

Within 3 weeks to 3 months, depending upon the species and time of year, the rooted plugs are weaned off intermittent mist. We may immediately pot the plugs or they may be held up to 5 months (over winter) before potting to a $2^{1}/_{4}$ or 4-inch pot. Holding Ellepots for more than 1 month after rooting is not recommended because certain varieties become very root bound in the cell and are difficult to remove from the tray. The transplant medium that both our plugs and Ellepots are potted into is composed of 5 perlite : 3 aged pine bark : 2 peat moss (by volume) with a small amount of limestone and slow-release fertilizer.

CONCLUSIONS

The most dramatic improvement in rooting occurred with *Amelanchier, G. lydia,* the majority of the *Rosa* taxum, and *Rhus aromatica* 'Gro-low' (Table 1). Results were compared for the years 2000 and 2001 combined (all rooted in our medium in either 72- or 98-cell trays) and compared with 2003 where all were rooted in Ellepots. These results were based on a minimum sample size of 4000 plants for each trial.

Two plant taxa had lower rooting percentages in Ellepots than in our medium (Table 2). This data was taken during the 2002 Season.

Plants showing little to no change in rooting percentage are listed in Table 3. Note *Rosa* 'The Fairy' rooted equally well in both Ellepots as our medium. Samples sizes for each trial were smaller than the above trials but had at least 1000 plants each.

Rooting percentages are only part of the reason for using Ellepots in our production cycle. Equally important is the improvement we have noted in reducing transplant loss. Many taxa rooted acceptably in our peat/perlite medium. However, upon transplant, we would experience increased losses because certain taxa have very few or fragile roots that often were pulled off during the transplant procedure.

Table 3. Plants showing little to no change in rooting percentage.

Plant	Rooting our medium (%) 2002	Rooting Ellepots (%) 2002
Berberis thunbergii 'Bagatelle	58	58
Euonymus fortunei 'Blondy'	80	74
Rosa 'The Fairy'	92	90

Plants that are especially susceptible to this are *A. polifolia*, *C. apiculatus, C. horizontalis*, and *G. lydia.*

Another production problem is when plants are slow to root into media. These include *A.* × *grandiflora* cultivars, *E. alatus* cultivars, *E. fortunei* cultivars, *H. kalmianum*, and *K. japonica* 'Picta'. Many times these plants were not ready to ship on time and would have to be held over until the following spring, thus costing significantly more in production costs.

Rosa cultivars fall into the category of excessive transplant losses of 10% to 30% after being transplanted from plugs into a 4-inch pot. The use of Ellepots has virtually eliminated transplant loss of *Rosa* cultivars.

We believe that the use of Ellepots has proven to be a valuable production tool. Although they are not a magic bullet for all plants with low rooting or transplant challenges, they have been well worth the additional cost for the plants showing positive results above.