Poinsettia cuttings exhibit significantly improved adventitious root formation and transplant establishment when propagated in OASIS® Wedge® foam substrate compared to peat-lite soilless mix.

Vijay Rapaka, Ph.D.
Director of Global Grower Operations & Research
Oasis Grower Solutions

Introduction

The speed and quality of adventitious root formation in vegetative cuttings are primary determinants of success for both propagation of young plants and finished plant production. Substrate plays a critical role in assuring healthy, productive rooting as well as eventual transplant success. This is especially evident with challenging plants such as poinsettias.

For unrooted poinsettia cuttings, which demand substantial hydration during propagation, growers often walk a fine line between adequate water and oversaturation of the propagation media. The development of "water roots" during propagation can in turn cause transplant shock and delay in establishment or even jeopardize the survival of the transplant.

Fig. 1. Root formation of OASIS® Wedge® foam-propagated poinsettia cutting, 72 hours after transplant. (Extracted and washed.)

For superior propagation performance, substrates must balance the substantial higher water needs of high-evapotranspiration cuttings, such as poinsettias, without creating detrimental conditions in the root zone. Speed and quality of adventitious roots can provide a clear indicator of substrate performance and success.

Objective

The objective of this experiment was to examine adventitious root formation of poinsettia cuttings during propagation in OASIS® Wedge® foam substrate compared to peat-lite mix, and assess transplant establishment and root growth during the initial 72 hours following transplant.

Materials & Methods

OASIS® Wedge® foam propagation substrate and peat-lite soilless mix were used in this study. The soilless mix (peat, perlite and vermiculite) was filled in 3 cm diameter x 4 cm height cavities in 13-count strips. The OASIS® Wedge® foam substrate used was 13-count strips.

Unrooted 'Prestige Red' poinsettia cuttings were obtained from Ecke Guatemala. Immediately upon receipt, the unrooted cuttings were unpacked and inserted into the OASIS® Wedge® substrate and the peat-lite mix for propagation on a mist bench. In both treatments, 13 cuttings were stuck per strip (n=2). No rooting hormone was applied.

During propagation, cuttings were misted during the first 10 days and then hand watered with a hose and a breaker for the rest of the 20-day propagation period. Rooting evaluation in terms of number of rooted cuttings and extractable plugs were recorded and photographed.

After evaluation at 20 days from insertion, rooted cuttings from both treatments were potted into 4-inch pots with soilless

Materials & Methods (cont.)

media. Only cuttings that were rooted well were potted. Immediately after transplanting, the pots were irrigated until the media was saturated. For the next 3 days, the young plants were not irrigated. Pictures were taken at 24-hour intervals. After 72 hours, the young plants were extracted from the pots and examined. The roots of the extracted young plants were then washed for closer examination.

At 20 days after insertion, prior to transplant, poinsettia cuttings rooted in OASIS® Wedge® strips were larger and more robust than cuttings rooted in peat-lite soilless mix, as shown in Figure 2.

Fig. 2. Poinsettia 'Prestige Red' rooted cuttings at day 20. OASIS® Wedge® strip on the left, peat-lite soilless mix strip on the right.

As shown in Figures 3 and 4, the cuttings stuck in OASIS® Wedge® were 100% rooted, fully extractable and showed well-branched roots. There was no evidence of "water root" formation.

The cuttings rooted in peat-lite propagation mix were far behind in rooting. Out of 13, only one cutting was extractable with proper root ball. The rest either had very small root initials or did not strike any roots. Also, the roots were not as well branched as the foam-propagated cuttings.

At 24 hours and 48 hours after transplant, young plants rooted in both foam and peat-lite mix exhibited little obvious visible change from the time of transplant.

However, when examined 72 hours after transplant, the roots from cuttings propagated in OASIS® Wedge® had grown all the way to the bottom of the pot. There were no signs of transplant delay, and the foam-propagated cuttings had rooted rapidly into the surrounding media, as shown in Figure 5. In contrast, 3 days after transplant, cuttings propagated in peat-lite media showed no roots at the bottom of the pot.

At 72 hours after transplant, the rooted cuttings were then extracted from the transplant media and washed to expose root formation more clearly. As shown in Figure 6, root formation in the foam-rooted cuttings was more extensive with branching/secondary roots than the cuttings propagated in peat-lite mix.

Fig. 3. Poinsettia 'Prestige Red' rooted cuttings at day 20, in OASIS® Wedge® (top) and soilless mix (bottom). The foam-propagated cuttings displayed better, more robust branching. (Only well-branched cuttings were then transplanted.)

Fig. 4A–B. (Close-up) Poinsettia 'Prestige Red' cuttings at day 20 of propagation, in OASIS® Wedge® on the left (4A) and soilless mix on the right (4B). The foam-propagated cuttings were well branched and showed no signs of "water roots."

Fig. 4A

Fig. 4B

Fig. 5A–B. Poinsettia 'Prestige Red' rooted cuttings 72 hours after transplant. Transplant on the left (5A), propagated in OASIS® Wedge®, had rooted to the bottom of the pot within 72 hours. Transplant on the right (5B), propagated in peat-lite, mix had not.

Fig. 5A

Fig. 5B

Fig 6A–B. Poinsettia 'Prestige Red' rooted cuttings 72 hours after transplant, extracted from the growing media and washed. On the left (6A), foam-propagated cuttings showed significantly improved root formation compared to peat-lite cuttings on the right (6B).

Fig. 6A

Fig. 6B

Conclusions

Poinsettia cuttings propagated in OASIS® Wedge® clearly displayed faster and better adventitious root formation compared to cuttings propagated in peat-lite soilless mix. Observed at 20 days after insertion, the rooting was uniform and 100% extractable when propagated in OASIS® Wedge®, whereas in peat-lite mix the rooting was nonuniform, inferior and only one out of 13 was extractable. Roots of the foam-propagated cuttings were well branched and robust, with no evidence of "water roots."

When transplanted 20 days after insertion, the foam-propagated cuttings displayed no signs of transplant shock or any type of transplant delay. In fact, the foam-propagated plants remained turgid, even though they were not re-irrigated during the 72-hour experiment, and roots grew to the bottom of the pots within 72 hours of transplant.

As evidenced when washed after extraction, poinsettia cuttings propagated in OASIS® Wedge® foam substrate had significantly improved branching and secondary roots compared to peat-lite transplants. This illustrates that OASIS® Wedge® is a superior substrate for adventitious root formation and transplant performance with poinsettia cuttings.