GROWERTALKS

Features

11/1/2024

Sticking Head Start

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For any grower who's tried rooting cuttings of herbaceous ornamentals, the question always comes up: Should I use rooting hormones to speed up rooting?

The answer to this question depends on the speed of rooting for that crop. Cuttings that root quickly on their own, showing roots within five days after sticking, don't need the addition of a rooting hormone. But many crops take longer (Tables 1 and 2) and some cuttings may take longer than five days if subjected to stresses during shipping, such as high temperatures in boxes, ethylene damage, improper cutting sizes or wilting. Rooting hormones will be more beneficial if less-than-optimum rooting conditions are prevalent, such as cool root-zone temperatures (<65F/18C), low light and short days. And grouping many different trays together in the same mist area can be a challenge for rooting speed (Figure 1).

Figure 1. Grouping many different trays together in the same mist area can be a challenge for rooting speed.

What to use & how to use it

There are various types and formulations of rooting hormones, but all contain some concentration of synthetic auxins such as IBA (indole-3-butyric acid), or a combination of IBA and NAA (napthaleneacetic acid) that come in the form of talc powders (Hormodin or Rhizopon AA #1, 2 or 3), water-soluble tablets or powders (Hortus salts, Rhizopon tablets), or liquids (Advocate, Dip'N Grow). Depending on the product and label, hormone applications can be made before or after stick, using methods such as basal quick dip, basal long soak, stem base spray, total immersion or foliar spray.

The most common method of applying a rooting hormone was the basal quick dip into powder or liquid and then quickly sticking into the rooting media. However, this method is time consuming and labor intensive, so growers are now moving towards applying rooting hormone as a foliar spray or stem base spray (Hortus salts, Rhizopon tablets, Advocate) within 24 hours after sticking cuttings into rooting media. (Dip'N Grow cannot be used for this method, as it's alcohol-based and will cause phyto problems.)

The stem base spray is done at a higher spray volume (>2 qts./100 sq. ft.) after sticking to get rooting hormone dripping down into the media and be closer to the cut stem for faster rooting. Allow a mist-free period of one to two

hours for the rooting hormone to be absorbed into the cutting. Follow the label rates, which will vary based on the type of cutting. Generally, the water-based sprays can be done as a trial at rates from 80 to 300 ppm for annuals and soft perennial cuttings, going up to 1,500 ppm for more difficult-to-root herbaceous and perennial cuttings. If rooting is still slow or erratic, then reapply the foliar or stem base spray after 10 to 14 days at the same rate or higher if you started at the low end of the suggested rate range. Again, it's critical to follow the label and do your own trials for rates and methods of applying to avoid damage and loss of cuttings.

Condition of the cuttings

There are other cultural and environmental factors that influence speed or success of rooting—it starts with the quality of cuttings and any shipping stress. Warm temperatures in shipping boxes cause cuttings to produce ethylene, which causes lower leaf yellowing and drop after sticking. Ideal root zone temperatures should be 72 to 75F (22 to 23C), but if soil temperatures are lower, especially with cool mist temperature, then rooting is delayed. Also, too much mist will delay callus and root formation, and lead to more diseases such as Botrytis and Rhizoctonia in propagation. I've seen more problems in propagation and rooting with overmisting cuttings.

Another factor is rooting media that's too fine or too tightly packed for proper balance between air porosity and water-holding capacity. Different types of rooting media require different moisture management, with Oasis wedges requiring consistent moisture (Level 4 or higher), but Ellepots wanting some drying (Level 2 to 3) due to packed peat -based media.

Finally, low light levels (daily light integral or DLI of 2 moles/day or lower) won't allow cuttings to have sufficient photosynthesis to make enough food for roots to grow, but a DLI of 5 to 10 moles/day would be ideal. Providing supplemental lighting in your propagation area will be worth the cost when days are short and light is low.

Other rooting inputs

Rooting stimulants are different than rooting hormones and can be applied before or after transplanting. Generally, the most benefit is when stimulants are applied before transplanting, but not seen until sometime after transplanting. Stimulants can increase root mass, and nutrient and water uptake. Some also provide some root disease control, and more tolerance to moisture and temperature stress during finished production and shipping.

Biofungicides such as RootShield Plus can be applied in growing media before sticking or applied after sticking as a drench. RootShield Plus will help provide protection against Pythium, Phytophthora, Fusarium and Rhizoctonia, and can show better root growth even before transplanting. There are now some chemical fungicides that not only provide control against the above root diseases, but also seem to provide stress tolerance and more root mass (Pageant Intrinsic and Empress Intrinsic).

Finally, we have arbuscular mycorrhizae (AM) fungi, which can colonize plant roots, forming a mutually beneficial relationship or symbiosis. The plant roots provide sugars and lipids to the fungus, and in return, the fungus acts as an extension of the root system, providing the plant with water and nutrients. Mycorrhizae can be applied to the growing media mix prior to sticking or transplanting, or applied as a thorough drench in propagation or before transplanting. It takes time for the symbiosis to establish. It can take four weeks for AM colonization of plant roots to establish and up to eight weeks for benefits to be noticed. The earlier the symbiosis is established, the better the results, particularly for short-term crops. The early application can significantly improve transplant success and can shorten production time due to enhanced growth. Watering frequency and fertilizer rates can be reduced with no detrimental effects on plant growth.

Using rooting hormones properly can speed up rooting of cuttings that normally would take longer than five days to callus and start to show roots. The method of applying that rooting hormone is up to the grower, the size of their operation, how many cuttings need to be stuck, labor to do the job and how many different crops are being

propagated. Rooting stimulants can help further with more root mass, better water and nutrient uptake, protection against some root diseases, and better tolerance to transplant shock, and water and temperature stresses. Make sure to focus on providing optimum root zone temperatures, avoid overmisting and start with quality cuttings for best success in propagation.

Table 1. Crops that essentially need rooting hormone:

- Baptisia
- Brachycome
- Bracteantha
- Calibrachoa
- Cineraria
- Crossandra
- Dahlia
- Dianthus
- Dipladenia
- Dracaena
- Euphorbia
- Geranium
- Gazania
- Gypsophila
- Heliotrope
- Heuchera
- Hydrangea
- Iberis
- Lantana
- Lithodora
- Lobelia
- Mandevilla
- Osteospermum
- Pericallis
- Scaevola
- Thunbergia

Table 2. Crops that may need rooting hormone:

- Alternathera
- Angelonia
- Argyranthemum
- Antirrhinum
- Artemesia
- Bacopa
- Begonia
- Bidens
- Bougainvillea
- Buddleia
- Calocephalus
- Campanula

Coreopsis
Cuphea
Delosperma
Diascia
Erysimum
Euonymus
Eupatorium
Fuchsia
Gallardia
Guara
Hedera
Helichrysum
Heliopsis
Hypericum
Lavender
Leucanthemum
Lobularia
Lotus Vine
Malva
Nemesia
Penstemon
Poinsettia
Phlox
Rosemary
Salvia
Santolina
Scabiosa
Strobilanthes
Torenia
Veronica
Vinca major
Vinca minor
Viola

**Per Roberto Lopez,* GrowerTalks, *February 2024*

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