



Mayra Toro-Herrera
mayra.toroh@uconn.edu



Rosa E. Raudales
rosa@uconn.edu

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“Sugar Translocators”

— a fad diet or a true program for rooting?

In this alert, we share the results of a project in which we evaluated a product labeled as a “sugar translocator” for its effect on rooting coleus.

Many horticultural species are vegetatively propagated through shoot-tip cuttings taken from stock plants and planted to develop adventitious roots (aka rooting).

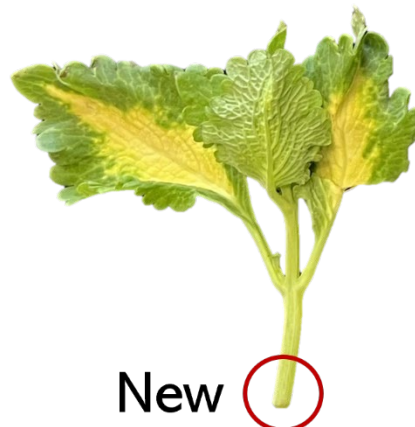
Successful rooting is essential during propagation, as well-rooted cuttings are critical for optimal growth, development, and high-quality plants.

Assuming optimum environmental conditions and high quality of the mother plant are provided, a factor that affects rooting is how the unrooted cuttings reallocate carbohydrates in the rooting process.

The disruption of nutrient supply from the mother plant triggers the reallocation of carbohydrates into the root regeneration zone (Figure 1). Therefore, anything that affects the sink strength of tip of the cuttings will directly impact the quality of plugs.

Our study aimed to evaluate if Sugar Mover® Premier—a product labeled as sugar translocator— had an impact on the quality of rooted cuttings.

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New  carbohydrate sink

Figure 1. Establishment of a new carbohydrate sink at the stem base following resource isolation from the stock plant.

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What we tested

We evaluated if the application timing of Sugar Mover® Premier—a cytokinin (CK), Boron and Molybdenum-based product—affected the quality of the overall quality of the cuttings using Coleus (*Plectranthus scutellarioides* cv. Wild Lime).

What we did

We applied Sugar Mover® Premier to the cuttings as a foliar spray during sticking, callus formation, root development, and toning phases of propagation and compared the plants with untreated plants (Figure 2 and 3). The product was applied at a rate of 0.51 ounces per gallon of water. The plants were propagated in 51-plug trays.

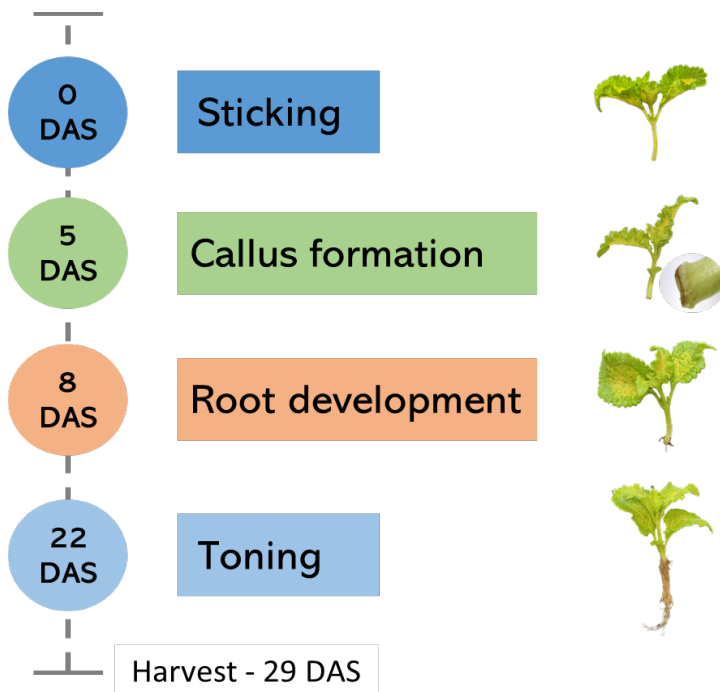


Figure 2. Study timeline illustrating the progression of each adventitious rooting stage, measured in days after sticking (DAS).



Figure 3. Visual of *Plectranthus scutellarioides* cv. Wild Lime from the sticking stage at 0 days after sticking (DAS) until the roots reached the edge of the tray at 22 DAS.

Determining Each Stage: Application timing was based on additional plants grown under the same conditions for destructive sampling. Five cuttings were randomly selected daily to verify rooting status and determine when to start each treatment (Figure 3).

Measurements: At harvest (29 days), we measured root and shoot length, dry matter accumulation, and leaf chlorophyll content.

What we learned

Product application during sticking caused some phytotoxicity symptoms (Figure 4), along with the shortest roots and shoots lowest biomass, and reduced sugar content. Compared with the untreated control, the plants were overall smaller (Figure 5).



Figure 4. Phytotoxicity symptoms (marginal necrosis) observed when the product was applied during sticking.

Application during callus formation resulted in sub-optimal plug quality. The shoots were elongated and with fewer leaves and roots compared with other treatments (Figure 5).

When the product was applied during the initiation of root development, the plants had the longest shoots and roots, an increased number of leaves, and total dry matter compared with all treatments (Figure 5).

Applying the product at the toning stage did not impact the quality of the cutting compared with not treating the cutting with anything (Figure 5).

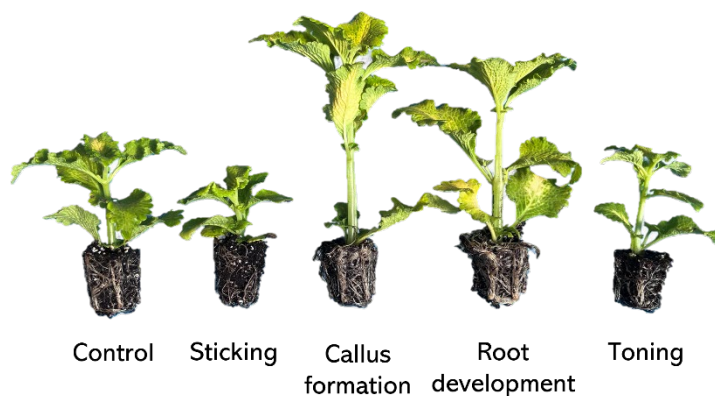


Figure 5. Visual representation of shoot growth and roots of *Plectranthus scutellarioides* cv. Wild Lime at 29 days after sticking (DAS)

What we concluded

The application of Sugar Mover® Premier during the 'root development stage' increased the overall size of the roots and shoots—resulting in a visually robust plug. This might be beneficial for other plant species where growth is slow.

Application during sticking and callus formation, negatively affected the overall quality of the plugs.

More information at:

Toro-Herrera MA & RE Raudales. (2024) <https://doi.org/10.21273/HORTSCI17756-24>

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CONTRIBUTORS

Dr. Nora Catlin
Floriculture Specialist
Cornell Cooperative Extension
Suffolk County
nora.catlin@cornell.edu

Dr. Chris Currey
Assistant Professor of Floriculture
Iowa State University
ccurrey@iastate.edu

Dr. Ryan Dickson
Greenhouse Horticulture and
Controlled-Environment Agriculture
University of Arkansas
ryand@uark.edu

Dan Gilrein
Entomology Specialist
Cornell Cooperative Extension
Suffolk County
dog1@cornell.edu

Dr. Chieri Kubota
Controlled Environments Agriculture
The Ohio State University
kubota.10@osu.edu

Heidi Lindberg
Floriculture Extension Educator
Michigan State University
wolleage@anr.msu.edu

Dr. Roberto Lopez
Floriculture Extension & Research
Michigan State University
rglopez@msu.edu

Dr. Neil Mattson
Greenhouse Research & Extension
Cornell University
neil.mattson@cornell.edu

Dr. W. Garrett Owen
Sustainable Greenhouse & Nursery
Systems Extension & Research
The Ohio State University
owen.367@osu.edu

Dr. Rosa E. Raudales
Greenhouse Extension Specialist
University of Connecticut
rosa.raudales@uconn.edu

Dr. Alicia Rihn
Agricultural & Resource Economics
University of Tennessee-Knoxville
arihn@utk.edu

Dr. Debalina Saha
Horticulture Weed Science
Michigan State University
sahadeb2@msu.edu

Dr. Beth Scheckelhoff
Extension Educator - Greenhouse Systems
The Ohio State University
scheckelhoff.11@osu.edu

Dr. Ariana Torres-Bravo
Horticulture / Ag. Economics
Purdue University
torres2@purdue.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Dr. Jean Williams-Woodward
Ornamental Extension Plant Pathologist
University of Georgia
jwoodwar@uga.edu

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