ref 1t, 3t,

Foliage Digest

VOL. XIII NO. 3 | A Technical Publication for the Foliage Industry | MARCH 1990

Be 1 - Jaacov 90

Long-Term Dark Storage of *Dieffenbachia* Sprayed with Cytokinin

by J. Ben-Jaacov[1], R.T. Poole and C.A. Conover[2]

Florida foliage plant growers are in the process of developing an international market for their products. Development and expansion of this market depends on surface transportation, currently the only cost effective method of shipping large quantities of potted plant material over long distances. Plants must survive a storage time of 2 to 4 weeks while in route, without suffering marked reduction in quality. Some species, like *Dieffenbachia*, show deterioration if stored for more than 20 days, with lower leaves yellowing, browning and eventually dropping. Plant hormones are known to play an important role in this aging process, possibly by directing transport of metabolites within the plant. The plant hormone, 6-benzylamino purine (BA) controls terminal growth and encourages development of laterals. The end result is a fuller, more compact plant, with a characteristic color.

Two experiments were conducted to study effects of BA sprays on quality of *Dieffenbachia* stored in the dark. *Dieffenbachia maculata* (Lodd) G. Don 'Rudolph Roehrs' was grown in eight-inch pots for 60 days in a shadehouse under 80% shade. Average plant height at initiation of experiment was 42 inches. Experiment 1 was performed to test effects of four levels of BA spray on quality of plants stored for 30 days in the dark. Four levels of BA were applied to the entire plant or only to the four bottom leaves. Twenty-four hours after spraying, plants were paper sleeved, boxed and placed in dark storage at 62° F and 65% RH (relative humidity). After the 30 day storage period, plants were placed in a holding room with temperature of 80° F and 65% RH where they received light intensity of 75 ft-c for 12 hours daily from cool white fluorescent lamps. Plant color was evaluated by grading the seven lowest individual leaves on a scale of 1 to 5 (1 = dead or completely yellow; 3 = partial yellow, but salable; 5 = excellent green color) immediately after removal from storage and again after two weeks. Color grade of leaves numbered 2, 5 and 8 of each plant, counting from the lowest leaf was determined immediately after removal from storage (Table 2).

Plants sprayed with BA at levels of 0.62, 1.2 and 2.50 g/gal retained more leaf color than plants not sprayed. Plant quality was much better when all leaves were sprayed (Table 1). Bottom leaves turned yellow to brown on plants not sprayed with BA, and when only the lower four leaves were treated with BA, those leaves remained green, while untreated middle leaves became chlorotic. When the entire plant was treated with BA, all leaves remained green.

Experiment 2 used plants grown and stored under the same conditions as experiment 1. Before storage, plants were sprayed with water or BA. From additional plants, leaves were removed and leaf stems placed in water in a storage room.

Plants which were not sprayed with BA produced chlorotic leaves. When

[1]Professor, Volcani Center, Bet Dagan, Israel.
[2]Professors, CFREC - Apopka, 2807 Binion Rd., Apopka, FL 32703.

CONTENTS

leaves were detached from similar plants and unsprayed, they maintained good color throughout the entire storage period. Lastly, when the entire plant was sprayed with BA, all leaves remained green.

The bottom leaves of unsprayed plants may have deteriorated because *Dieffenbachia* were not able to manufacture essential materials needed during respiration, while in long term dark storage. Materials vital to growth may have been moved from the oldest leaves into younger, still expanding leaves. This movement could have been prevented by the application of BA. When only bottom leaves were sprayed, middle leaves apparently lost essential components and turned yellow. When individual leaves were removed and stored in the dark, movement of essential materials could not take place, and therefore chlorosis and yellowing was delayed. These data indicate the effect of BA spray was localized, not systemic.

Application of BA to *Dieffenbachia,* and other plants might be a useful method for preventing lower leaf deterioration when plants are dark stored for long periods of time. Care must be taken during application to spray entire plants, as any middle to lower leaves missed will show deterioration during storage.

Additional References

1. Ben-Jaacov, J., R.T. Poole and C.A. Conover. 1982. Effect of nutrition, soil water content and duration of storage on quality of *Dieffenbachia maculata* (Lodd) G. Don 'Rudolph Roehrs'. HortScience 17:611-612.
2. Molisch, H. 1938. Die Lebensdauer der Pflanzen, Engl. translation by H. Fulling, The Longevity of Plants. Science Press, Lancaster.
3. Nooden, L.D. 1980. Senescence in the whole plant. In: Senescence in Plants. CRC Press, Inc., Boca Raton, FL, USA. Ed. K.V. Thimann, pp 219-258.
4. Poole, R.T. and C.A. Conover. 1979. Influence of shade and nutrition during production and dark storage simulating shipment on subsequent quality and chlorophyll content of foliage plants. HortScience 14:617-619.
5. Thimann, K.V. 1980. The senescence of leaves. In: Senescence in Plants. CRC Press, Inc., Boca Raton, FL, USA. Ed. K.V. Thimann, pp. 85-115.

Table 1. Color grade of 7 lower leaves of *Dieffenbachia maculata* 'Rudolph Roehrs' immediately after removal from 30 days of dark storage and again after 2 weeks.

BA g/gal	Color grade* Immediately	Color grade* Two Weeks later
0.0	3.0	2.2
.62	4.4	2.9
1.2	4.3	2.9
2.5	4.3	3.2
Leaves sprayed		
All	4.2	3.1
Lower 4	3.8	2.4

*1 = dead, yellow; 3 =partial yellow but salable; 5 = normal, excellent color.

Table 2. Color grade of leaves of *Dieffenbachia maculata* 'Rudolph Roehrs' graded immediately after removal from 30 days dark storage at 62°F.

		Leaf no. from bottom		
BA g/gal	Leaves sprayed	2 Color grade*	5 Color grade*	8 Color grade*
2.5	All	4.4	4.9	5.0
	lower 4	4.2	2.3	5.0
0.0	All	1.2	4.1	4.9

*1 = dead, yellow; 3 = partial yellow but salable; 5 = normal, excellent color.

FOLIAGE DIGEST

Prepared Monthly by
National Foliage Foundation
P.O. Box 2507, Apopka, FL 32704
Kathy Phillips, Editor

Bruce Barmby, M.S.
Technical Editor

Ann Chase, Ph.D.
Technical Editor

Richard Henley, Ph.D.
Technical Editor

Lance Osborne, Ph.D.
Technical Editor

Library of Congress Number
ISSN 0740-2694