

HORTICULTURE DIGEST

Department of Horticulture
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In This Issue: FLOWER AND NURSERY INFORMATION
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CYTOKININS STIMULATE BUD INITIATION ON CORDYLINE CUTTINGS

In experiments conducted at the University of Hawaii, two cytokinins, N⁶-benzyladenine (N⁶ BA), and 6-(benzylamino)-9-(z-tetrolidropyran-9-yl)-9-H-purine (PBA), were applied to cuttings of *Cordyline terminalis* 'Onomea' at concentrations of 50, 100 and 500 ppm. The results are presented in Table 1.

Table 1. Effects of two cytokinins on bud initiation and development in *Cordyline terminalis* 'Onomea'.

Chemical	Conc.	Ave. no. of buds initiated per cutting	Ave. no. of buds developed per cutting	Percent buds developed per cutting
N ⁶ BA	(ppm)			
	500	3.9	2.4	62.6
	100	3.7	2.0	54.0
PBA	50	4.3	2.0	46.5
	500	4.1	2.8	68.3
	100	6.0	2.8	58.6
Control	50	6.0	2.2	36.7
	-	4.0	1.5	37.5

Both N⁶ BA and PBA were effective in stimulating bud initiation and development in cordyline. The highest concentration of 500 ppm of each chemical was the most effective in stimulating development of buds without phytotoxicity. PBA was somewhat more effective than N⁶ BA. PBA did cause a reduction in the growth rate of

the shoots, which could possibly be accounted for by the fact that with large numbers of shoots developing on a single stem, there was a greater competition between shoots for nutrients.

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COMING EVENTS

HAN Annual Conference

The 16th Annual Nurserymen's Conference sponsored by the Hawaii Association of Nurserymen in cooperation with the University of Hawaii, College of Tropical Agriculture, will be held at the Ilikai Hotel in Honolulu on June 2 to 4, 1976. Featured speaker for the June conference will be Dr. Charles A. Conover, Director of the Agricultural Research Center at Apopka, Florida. Also from the mainland will be Scott Chiles, Advertising Manager for Ortho Division of Chevron Chemical Co.

Special sessions are being planned for retail garden shops, wholesale growers, and those interested in the export foliage business. Several panel presentations have been developed on retail problems, pot plant production, financing, and shipping. In addition the trade show has been expanded to provide 50 exhibitor booths.

State Farm Fair

The 1976 Hawaii Farm Bureau Fair has been scheduled for June 30th to July 10th.

Plant Propagators

The Western Region International Plant Propagator's Society annual meeting will be held at the Asilomar Conference Center in Pacific Grove, CA., on Sept. 8-10, 1976.

Oregon Nurserymen

The Oregon Association of Nurserymen will hold their convention and Indian Summer Session at The Dunes, September 9-12, 1976, at Lincoln City, Oregon.

California Nurserymen

The 66th Annual Convention of the California Association of Nurserymen will be held September 28-30, 1976, at the Sheraton Inn Hotel, Fresno, California. For information contact: CAN Office, Suite 303, 1005 8th St., Sacramento, CA 95814.

Pacific Horticultural Trade Show

The Anaheim Convention Center will be the site for the Pacific Horticultural Trade Show September 11-13, 1976, in Anaheim, CA. For information contact: Robert Jordan, Box 1100, Garden Grove, CA 92642. The show is sponsored by the California Association of Nurserymen.

Farwest Show

The Farwest Nursery, Garden, and Supply Show will be September 22-24, 1976, at the Memorial Coliseum in Portland, Oregon. The show is sponsored by the Oregon Association of Nurserymen. For information contact: Farwest Nursery Show Office, 222 S.W. Harrison, Portland, OR 97201.

REPORT ON A-REST

A-Rest (ancymidol) is a new-generation growth regulator from Elanco Products Co. that permits reducing plants to any desired height. This "linear response" is related to dosage, so that heavier applications of A-Rest produce more compact plants, while lighter applications produce plants nearer to normal growth habits. Even extreme size reductions are attainable with A-Rest, if desired.

Highly Active Compound—At the rates shown in the Rate Tables, one quart of A-Rest will treat approximately 500 to 1,000 plants. Only small amounts of A-Rest are needed for treatment.

Wide Range of Uses—A-Rest has produced excellent results on such commercial greenhouse plants as chrysanthemums, Easter lilies, and poinsettias.

Natural Control—A-Rest regulates the natural growth of the plant by reducing internode elongation. This reduces stem length and pro-

duces more attractive, easier to ship plants, "made to measure" for regional market preferences. Response to treatment begins immediately after application, with results quickly visible in a few days.

How to Apply—A-Rest is effective when applied either as a soil drench or as a foliar spray. The soil drench method is recommended because of the greater accuracy of dosage which can be achieved. The foliar spray method requires careful attention to proper dosage since the amount absorbed by the plant depends on leaf area, leaf overlap, amount of run-off into the container soil, and other factors. A-Rest should be diluted with water and applied according to the general recommendations and Rate Tables.

General Recommendations—Growth regulation needs vary regionally according to cultural practice, locally preferred plant size, plant variety, and other factors. However, A-Rest can produce optimum results under almost any condition, as long as trials are established under local growing conditions.

As a guide for initial trials, a range of rates and times of applications should be included. Most uniform plant growth generally comes with early application. Plants regularly treated with growth retardants should be treated with A-Rest when plants are small but with established root systems. However, for plants which need not be greatly reduced in size, application may be delayed until a need is established. A-Rest is effective through the mid-bud stage (buds large enough to be easily counted) on many plants including lilies and chrysanthemums. Trials ranging from 0.25 mg. to 0.5 mg. per six-inch pot will generally produce optimum results.

For more flexible control a split application technique may be used, applying half the normal dose at an early growth stage and the other half dose later if needed.

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ORGANIC FERTILIZERS

With the shortage of fertilizers many plantmen have been looking for other sources of plant nutrients. One of the major alternative sources is the organic fertilizers that have always had a place in plant culture.

Table 2. Some available organic fertilizer materials.

Fertilizer	Approximate Analysis			lbs/100 sq. ft.	Comments
	N	P ₂ O ₅	K ₂ O		
Blood	12	1.5	0.5	3 - 4	Rapidly available source of Nitrogen.
Guano, Bat	6	9	3	3 - 4	Partially decomposed bat manure from caves in S.W. United States.
Bird droppings	13	11	2	2 - 3	Partially decomposed bird manure from islands off coast South America.
Kelp or Seaweed	1	0.5	9	5	Source of K.
Meal					
Bone, raw	4	20	0	5	Phosphorus very slowly soluble.
Bone, steamed	2	27	0	5	Phosphorus is soluble but some nitrogen is lost by steaming.
Cotton seed	6	2.5	2.0	3 - 4	Acid in reaction, good for "acid-loving" plants. i.e.: Azaleas, Rhododendrons, etc.
Hoof & horn	14	0	0	2	This steam treated, ground organic is a good source of N.
Peanut hulls	1	0	1	5	Low in N.
Manure					
Cattle	0.5	0.3	0.5		Manures are generally low in nutrients, but when used in larger amounts, as a soil conditioner, they do add fertilizer. Avoid use of fresh manure or use too soon after steaming. Nutrient content variable particularly with bedding materials used. <i>May be high in soluble salts.</i>
Chicken	1.0	0.5	0.8		
Horse	0.6	0.3	0.6		
Sheep	0.9	0.5	0.8		
Swine	0.6	0.5	1.0		
Mushroom (spent)	1.0	1.0	1.0		
Peat	2.0	0.3	0.3	5	Used as a soil conditioner.
Sludge,					
Sewage	2.0	1.0	0.5	5	Variable, check source. Avoid those possibly contaminated with heavy metals (from industry).
Activated	6.0	3.0	0.5	3 - 4	Micro-organisms added.
Tobacco stems	1.5	1.0	6.0	5	Good source K ₂ O, alkaline reaction.
Wood ashes	0	2.0	6.0	5	Source of K ₂ O, very alkaline.

Oftentimes there was a tendency to by-pass the organic materials because of low analysis, slow availability, inadequate supply, cost per unit of nitrogen, or more costly handling procedures. However, with the change in availability of the inorganic materials and the escalating costs, many plantmen are taking a second look at organic materials and using them to good advantage.

It is important to know what nutrients are available in the organic material to make a determination of a rate of application. But it is also desirable to understand the type of reaction the material will produce in the soil and the availability of the nutrients to plants. A few of the more readily available organics are summarized in the accompanying Table 2.

Farm manure is one of the finest soil conditioners available to the nurseryman. With the extensive use of herbicides, too little organic matter is returned to the soils.

Manure, applied to a nursery soil, will help in maintaining productivity of the soil.

In addition to supplying N, P, and K, manure also supplies calcium, magnesium, sulphur, and various minor elements essential for plant growth. Also, manure increases biological activity in the soil which improves nutrient availability. The humus supply serves to improve physical structure of soil and its nutrient holding capacity. Humus improves aeration, water holding capacity, and permeability of soils to water.

Farm manures are best utilized in the nursery within areas of intensive horticulture to max-

imize returns on invested capital. Use manure with care and avoid excess soluble salt problems associated with planting too soon following applicatios of fresh or steamed manure.

Harold Davidson
Voice of M.A.N.
September-October, 1974

AVAILABLE PUBLICATIONS

Basic Greenhouse Cost Accounting Manual

Mr. William Grimmer, Instructor in Commercial Floriculture at the Gateway Technical Institute, 3520 30th Avenue, Kenosha, Wisconsin 53140, and formerly of Holton and Hunkel, Inc., Milwaukee, has authored an excellent basic manual on greenhouse cost accounting. The subject assumes no prior knowledge of accounting. If you are interested in keeping better tabs on your costs in these days of increasing expenses, the manual is for you. Request Greenhouse Cost Accounting from W. W. Grimmer at the above address. They will quote the price on request.

New Opportunities for the Nursery Industry

Changing attitudes among consumers towards plant materials and home landscaping are reflected in a Horticultural Research Institute publication, "New Opportunities for the Nursery Industry."

The three-part survey report consists of The Image of the Nursery Industry, New Trends in Attitudes Toward House and Property, and Psychological Barriers and Bridges to Involvement in Buying Trees, Shrubs and Landscaping. A conclusion suggests marketing approaches which will make the most productive use in relation to the stated motivations.

The 24-page report is available to individuals for sale. A complimentary copy is provided to HRI members, libraries, and educators. Write to HRI, 230 Southern Bldg., Washington, D.C. 20005.

Growing Azaleas Commercially: A New Manual

A well-illustrated (with color photos) 108-page manual on azaleas is just off the press. Thirteen nationally-known authors including Dr. Richard Criley, University of Hawaii, have covered the taxonomy of azaleas, propagation, nutrition, light and temperature effects on growth, chemical control of growth and flowering, year around production, as well as insect

and disease control, and grades and standards. An easy-to-follow table for identifying common troubles is included. Editors are Dr. Anton M. Kofranek of the University of California at Davis and Dr. Roy A. Larson of the North Carolina State University.

This manual and reference is valuable to the commercial grower, teachers, students, and research workers.

To obtain a copy of this outstanding manual, write: Publications, University of California, Division of Agricultural Sciences, 1422 South 10th Street, Richmond, California 94084, requesting Publication 4058, *Growing Azaleas Commercially*. They will inform you of the cost.

John Henry Retailer's Guide to Foliage Plants

The John Henry Co. has a new foliage plant book available, The John Henry Retailer's Guide to Foliage Plants. It comes in 2 sections. The Retailer's Guide and accompanying manual. It provides full color illustrations on 183 foliage plants along with a special section on plant problems, light, water, temperature, humidity, fertilizer, growing media, how to repot, propagation, pests, and diseases.

The books are available from the John Henry Company, P. O. Box 17099, Lansing, Michigan 48901.

Reprints

Reprints of the following two articles are available by contacting the Horticulture Department, University of Hawaii, 3190 Maile Way, Honolulu, Hawaii 96822.

"Population Explosion" is the title of a paper presented by Richard A. Criley at the Western Region meeting of the International Plant Propagators Society. The paper discusses the various methods available for rapid increase of plant material and how to take advantage of limited propagation materials. Chemical aids to propagation are also discussed.

"Response of Chrysanthemum in Four Soilless Media" by R. A. Criley and R. T. Watanabe is a paper published in HortScience. The abstract of the article follows:

Chrysanthemum morifolium Ramat. cv. White Spider CF2275 plants were grown in soilless media comprised of an andesitic cinder and pumice inorganic component mixed in 4 ratios with 4 organic components, namely: sphagnum peat, aged wood shavings, aged

pineapple waste, and ground tree fern trunks (hapuu). The plant responses in the different media showed little difference from those in the control medium of equal parts of soil, peat, and perlite. Mixtures containing from 33 to 50% organic matter were satisfactory for plant growth. The physical and chemical characteristics of the media were within the range defined as satisfactory by previous researchers.

Instant Information

Two recent publications in the General Home Garden Series by Wade W. McCall are available: No. 8, "Soil Reaction (pH)", discusses the significance of pH and its influence upon plant growth and how we can adjust soil pH for better plant growth; No. 9, "Sewage Sludge", discusses the various types of sewage sludge and how we might use these materials more effectively in our gardens.

The Orange Spiny Whitefly in Hawaii

Entomology Notes No. 7 by Albert A. LaPlante, Extension Specialist in Entomology, describes a recent introduced insect pest into Hawaii. It presents an excellent summary of the life cycle of the orange spiny whitefly and suggests some methods for its control.

The Climate of Hawaii

Extension Leaflet 147 by Wade W. McCall, Extension Specialist in Soil Management, summarizes the various climatic factors (wind, temperature, clouds, and rainfall) found in Hawaii.

Ornamental Heliconias

This publication (Extension Circular 482) by Donald P. Watson and Robert Roy Smith attempts to pull together available information on ornamental heliconias culture found in Hawaii. A brief description is given on 13 common heliconias found in Hawaiian gardens.

Copies of the above publications issued by the College of Tropical Agriculture may be obtained by contacting your local County Extension Office or by writing Publications and Information Office, Rm. 107 Krauss Hall, 2500 Dole Street, University of Hawaii, Honolulu, HI 96822.

PERSISTENCY OF HERBICIDES

Persistency of herbicides, their ability to stay active for long periods of time in the soil and

prevent vegetative growth, can be both a good factor and a bad one, depending on the circumstances under which the herbicides are applied.

Circumstances are not the best: when too much herbicide is applied, or when the action of the herbicide continues to be effective during the following crop year. A method is needed to stop or reduce the action of the herbicide in the soil when its action is no longer needed.

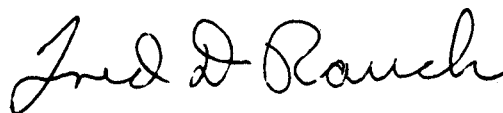
Scientists at the University of Arkansas Agricultural Experiment Station have found that activated charcoal added to the soil is very effective at stopping herbicidal activity.

Activated charcoal has a tremendous absorption potential for organic chemicals because of its great surface area and pore space, according to Dr. R. E. Talbert, assoc. agronomist. Herbicides are trapped on the surfaces and in the pores of the activated charcoal to stop the killing of susceptible plants.

Dr. Talbert found charcoal was less effective in stopping nitratin than in stopping fluometuron. He also determined that less charcoal was needed to do the job when more time was allowed between treatment and planting of sensitive crops. Charcoal remains active in the soil for three months, but was much less effective after six months.

Other possible applications include being used as a barrier around newly-planted trees and ornamental plants. This practice also includes the planting of horticultural tree fruits and small fruits.

Southern Florist & Nurseryman
May 25, 1973



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Assistant Specialist in Horticulture

NOTE: The use of trade names is for the convenience of readers only and does not constitute an endorsement of these products by the University of Hawaii, the College of Tropical Agriculture, the Hawaii Cooperative Extension Service, or their employees.