In conclusion, the intent of this report is to provide a guideline in the proper selection and utilization of fungicide drenches for control of soil-borne fungal pathogens of OTFP. Growers must realize, however, that soil fungicides are not a cure for poor culture. Proper management of soil-borne diseases in Florida can only be achieved by the proper and sensible employment of a control strategy developed and based upon available information on cultural, biological and chemical control. The information presented here on soil fungicides, when applied properly, will serve to assist in control of soil-borne fungal pathogens of ornamental tropical foliage plants.

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CHEMICAL DISBUDDING OF CHRYSANTHEMUM MORIFOLIUM RAMAT. WITH P-293[1]

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Abstract. **2,3-dihydro-5,6-diphenyl-1,4-oxathiin (P-293), applied to chrysanthemum plants grown under short day conditions, was ineffective in consistently disbudding 10 standard chrysanthemum cultivars grown in a polypropylene shade structure. Concentrations of 0.4, 0.6, 0.8, 1.0, 1.2, and 1.4% a.i. P-293 produced highly variable results when applied on 4 separate dates. High concn stunted the plants or aborted the terminal meristem. Low concn appeared to elongate the laterals. Only 'Orange Bowl,' 'Mountain Snow,' and 'Trident' showed favorable disbudding response with P-293, but the response was not significant enough to be of practical use.**

Chrysanthemum (*C. morifolium* Ramat.) growth can be modified by chemicals which: 1) disrupt or kill the apical meristem and allow normal growth of the lateral meristems, such as fatty acid esters (1, 3); 2) reduce cell elongation, such as SADH (13) and ancymidol (4, 8); 3) promote peduncle elongation without affecting the terminal meristem, such as gibberellic acid (14); and 4) retard internode elongation of the laterals without affecting development of the terminal meristem, such as xylene or kerosene-type emulsifiable oils (6) or alkylnapthalenes (7). Introduction of 2,3-dihydro-5,6-diphenyl-1,4-oxathiin (P-293), which acts as a localized growth inhibitor, has renewed interest in a method to chemically disbud standard chrysanthemums. Previous chemicals used to prevent lateral shoot development or disbud chrysanthemums produced highly variable results and were effective only under controlled conditions (5, 6, 7, 10). Recent reports indicate that P-293 can arrest the development of axillary meristems without affecting the terminal meristem in chrysanthemums (2, 9, 11, 12, 15). Concn of chemical and times of application were critical for specific cultivars for the successful retardation of lateral inflorescences.

Purpose of this research was to determine the effect of P-293 on disbudding standard chrysanthemums grown in black polypropylene shade structures in Florida.

Materials and Methods

General: Rooted chrysanthemum cuttings were planted in 15 cm high and 75 cm wide ground beds of Myakka fine sand (pH 6.2 after liming) in a shade house covered with black polypropylene cloth (25% shade). Plants were spaced 15 cm apart across the bed and 10 cm apart down the bed. Plants were maintained vegetatively for the first 4 weeks of each experiment by use of natural photoperiods supplemented with 4 hr light from incandescent lamps which provided 120 lux at plant height from 2200 to 0200 hrs daily. To induce flowering, the lights were removed. Single superphosphate and dolomite, at 560 and 1120 kg/ha respectively,

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were broadcast over the growing area and incorporated into the soil prior to bed preparation. Beds were fumigated with methyl bromide-chloropicrin (MC-33) at 392 kg/ha 2 weeks prior to planting. A single application of 6-2.6-5 and Osmocote(R) 14-6.1-11.6, at 560 and 2960 kg/ha respectively, was broadcast on top of the beds and provided the only other source of fertilizer. Two Viaflo(R) tubes, spaced 60 cm apart-down the length of the bed, provided irrigation. Stems were cut 10 cm above the ground at the commercially acceptable stage of flower development. Each treatment contained 6 plants and was replicated 4 times. All data were subjected to statistical analysis.

Fall 1976. In the preliminary evaluation of P-293, 7 chrysanthemum cultivars were planted on Sept. 8 and supplemental lighting was discontinued October 5. Plants were treated at concn of 0.4, 0.6, and 0.8% a.i. (from 47.3% a.i. emulsifiable concentrate) with single applications on 3 dates, established after the initiation of short days (SD). Treatment dates by cultivar were: 'May Shoesmith' (16, 18, 20 SD); 'Nob Hill' (18, 20, 22 SD); 'Mountain Snow,' 'Orange Bowl,' 'Super White,' 'Trident,' and 'Wild Honey,' (16, 20, 24 SD). The chemical was applied in 4 ml aliquots per plant (1 U.S. gal per 150 ft^2) with a CO_2 pressurized sprayer held 30 cm above the plant. A 0.5 mm orifice nozzle was used. Control treatment was a manual disbud 6 weeks after initiation of SD. 'May Shoesmith' was cut and measured on December 20 and the remaining cvs were harvested December 14. Stem length was recorded and was rated subjectively by assigning values to each stem based upon the degree of disbudding, with 1 = no effect, 2 = 50% of laterals $\leq$ 2 cm, and 3 = all laterals removed or $\leq$ 2 cm length.

Spring 1977. During the subsequent season 4 cvs. were treated at P-293 concn of 0.6, 0.8, 1.0, 1.2, and 1.4% a.i. in single applications on 4 dates. Cuttings were planted February 17 and supplemental lights were removed March 16. Treatment dates by cv. were: 'Nob Hill' (14, 16, 18, 20 SD); 'Albatross' and 'May Shoesmith' (16, 18, 20, 22 SD); and 'Imp. Mefo' (22, 24, 26, 28 SD). Spray volume was 4 ml per plant. Control treatments were a manual disbud 6 weeks after initiation of SD and a non-disbud. 'Imp. Mefo' was harvested on June 6 and the remaining cvs. were cut June 1. Stem length was measured and the degree of disbudding was rated as in the fall experiment.

Results and Discussion

The initial effect of P-293 in both experiments was evident within a week of application. The terminal growth turned a light green on the treated plants and, at the higher concentrations, was malformed. The lower foliage was not influenced by P-293. Since spray volume was not great enough for the material to run down the stem and collect in the leaf axils, any retardation of the laterals was a result of the chemical being translocated from the terminal leaves to the axillary buds. In the few treatments that showed a positive response to disbudding, the developing laterals were darker green than normal and had a clubby appearance. Disbudding on treated plants was not successful or produced highly variable results within treatment. Low concentrations (0.4%) retarded the development of the terminal inflorescence and stimulated elongation of lateral inflorescences. High concentrations (1.0 to 1.4% a.i.) caused the terminal inflorescence to abort or form crown buds.

Fall 1976. Results of the preliminary evaluation of P-293 (Tables 1 and 2) indicated a positive disbudding response only with 3 of the 7 cvs. tested. Among each of these cvs. ('Mountain Snow,' 'Orange Bowl,' and 'Trident') variability of plants within specific treatments was great and the use of the material could not be considered practical. Although

Table 1. Effect of P-293 on height and degree of disbudding of 2 chrysanthemum cvs., Fall 1976.

Concn. P-293 (% a.i.)	Date application	Chrysanthemum cultivars: May Shoesmith Disbud[z] rating	May Shoesmith Height[y] (cm)	Nob Hill Disbud rating	Nob Hill Height (cm)
0.4%	16 SD[v]	1.0a[x]	76ab	—[w]	—
0.4%	18 SD	1.0a	74ab	1.0a	87ab
0.4%	20 SD	1.0a	76ab	1.0a	86ab
0.4%	22 SD	—	—	1.0a	81a
0.6%	16 SD	1.0a	75ab	—	—
0.6%	18 SD	1.0a	72a	1.0a	80a
0.6%	20 SD	1.0a	72a	1.0a	82a
0.6%	22 SD	—	—	1.2a	82a
0.8%	16 SD	1.0a	77ab	—	—
0.8%	18 SD	1.0a	76ab	1.0a	85a
0.8%	20 SD	1.0a	77ab	1.0a	84a
0.8%	22 SD	—	—	1.2a	79a
Manually disbudded		3.0b	81b	3.0b	94b

[z]Subjective rating of 1-3; 1 = no effect, 2 = 50% of laterals $\leq$ 2 cm, 3 = all laterals disbudded or $\leq$ 2 cm length.
[y]Stem height from basal cut to base of terminal receptacle.
[x]Mean separation, within columns, by Duncan's multiple range test, 5% level.
[w]Dash indicates plants not treated with P-293 on these dates.
[v]Number of days after initiation of short day (SD) conditions.

Table 2. Effect of P-293 on height and degree of disbudding of chrysanthemum cvs., Fall 1976.

Concn. (% a.i.) P-293	Date application	Chrysanthemum Cultivars: Mountain Snow Disbud[z] rating	Mountain Snow Height[y] (cm)	Orange Bowl Disbud rating	Orange Bowl Height (cm)	Super White Disbud rating	Super White Height (cm)	Trident Disbud rating	Trident Height (cm)	Wild Honey Disbud rating	Wild Honey Height (cm)
0.4%	16 SD[w]	1.0a[x]	60ab	1.0a	47a	1.0a	78abc	1.1a	91abc	1.0a	63ab
0.4%	20 SD	1.0a	60ab	1.0a	48a	1.0a	77abc	1.1a	92bc	1.0a	62ab
0.4%	24 SD	1.5b	55b	1.0a	47a	1.0a	76abc	1.6bc	83ab	1.0a	59a
0.6%	16 SD	1.0a	61ab	1.2ab	45a	1.0a	79bc	1.4abc	85ab	1.0a	65b
0.6%	20 SD	1.3ab	62ab	1.6bc	46a	1.0a	75abc	1.4abc	84ab	1.0a	62ab
0.6%	24 SD	2.0c	56a	1.8c	44a	1.1a	74abc	1.8c	82a	1.2a	61ab
0.8%	16 SD	1.0a	62a	1.2ab	46a	1.0a	74abc	1.0a	90abc	1.0a	63ab
0.8%	20 SD	1.3ab	58ab	1.5bc	46a	1.1a	70a	1.2ab	86abc	1.2a	61ab
0.8%	24 SD	1.7bc	58ab	1.8c	43a	1.6b	71ab	1.0a	83ab	1.1a	61ab
Manually disbudded		3.0d	65b	3.0d	55b	3.0c	82c	3.0d	95c	3.0b	65b

[z]Subjective rating of 1-3; 1 = no effect, 2 = 50% of laterals $\leq$ 2 cm, and 3 = all laterals disbudded or $\leq$ 2 cm length.
[y]Stem height from basal cut to base of terminal floral receptacle.
[x]Mean separation, within columns, by Duncan's multiple range test, 5% level.
[w]Number of days after initiation of short day (SD) conditions.

previous reports (2, 11, 15) demonstrated positive results in disbudding chrysanthemums at the concentrations of P-293 and application dates used in this study, most of the responses found in this experiment were deleterious. The plants were short, many of the terminal flowers were malformed, and lateral stems which developed from the upper nodes were elongated. The last response indicated that chemical concentration was not high enough to retard development of the laterals. In the subsequent season the concentration was increased to determine if concentration was a limiting factor.

An evaluation of the response of each cv. grown to P-293 is as follows:

'May Shoesmith.' P-293 failed to disbud this cv. in any treatment. The terminal peduncle was noticeably shorter at 0.6% on 18 SD.

'Nob Hill.' Concn. of 0.4% stunted the terminal peduncle and elongated the upper laterals. The 0.6 and 0.8% applications on 22 SD retarded the laterals. Results were highly variable among plants within each treatment.

'Super White.' Only the 0.8% on 24 SD had any effect on the axillary stems. Many of the plants within this treatment produced laterals on the upper 3-4 nodes and the lower laterals either failed to develop or were less than 2 cm length.

'Wild Honey.' A few plants in treatments of 0.6% on 24 SD and 0.8% on 20 and 24 SD developed stunted laterals in the middle nodes. Effect of chemical was highly variable within all treatments.

'Mountain Snow.' This cv. was the most responsive to the chemical. Application on 24 SD consistently caused retardation of the laterals. Concn of 0.6% and 0.8% retarded all but 2-3 of the upper laterals on many of the stems but also stunted the terminal peduncle.

'Orange Bowl.' The 0.4% at 16 SD stimulated the elongation of the upper 3-4 laterals. Concn. of 0.6 and 0.8% on 20 and 24 SD retarded many of the laterals. Some stems in these treatments had only 1-2 laterals developed at the base of the terminal inflorescence.

'Trident.' The only treatments which consistently inhibited laterals were at 0.4% and 0.6% on 24 SD. At 0.8% the terminal peduncle was stunted and malformed.

Spring 1977. Results of treatments applied during the cool season were more negative than in the previous warm season (Table 3). Increased concentrations of P-293 above 1.0% failed to decrease the development of the lateral stems as compared to lower concn. The higher rates not only stunted the stems but aborted the terminal inflorescence. Each cv. had at least one treatment which retarded the laterals but, again, the results were highly variable among plants within the same treatment. No treatment was as effective as the manually disbudded plants in any of the cvs. evaluated.

Responses of the respective cultivars to P-293 are as follows:

'Nob Hill.' This cv. responded similarly in both seasons. A few plants at 1.0% on 14 SD had 3-4 laterals developed on the upper nodes with the lower laterals less than 2 cm length. Higher concn retarded lateral development but also stunted the terminal.

'May Shoesmith.' Only treatments which showed a positive response were 1.2% at 22 SD and 1.4% at 20 and 22 SD. In the first treatment the middle laterals were retarded and the upper 3-4 were normal on 5 of the 24 stems observed. In the latter 2 treatments some of the plants had all but 1 or 2 of the laterals retarded. Response was highly variable within treatments.

'Imp. Mefo.' The most effective treatments were at concn of 1.0% and above on 26 and 28 SD. Application of P-293 on 26 SD caused the laterals in the middle of the stems to be retarded. Treatment at 28 SD left only 3-4 of the upper laterals long and stunted the remainder. Concn. of 1.4% caused the terminal inflorescence to form a crown bud.

Table 3. Effect of P-293 on height and degree of disbudding of 4 chrysanthemum cvs., Spring 1977.

Concn. P-293 (% a.i.)	Date application	Chrysanthemum cultivar: Albatross Disbud[y] rating	Albatross Height[x] (cm)	Imp. Mefo Disbud rating	Imp. Mefo Height (cm)	May Shoesmith Disbud rating	May Shoesmith Height (cm)	Nob Hill Disbud rating	Nob Hill Height (cm)
0.6%	1st date	1.0a[w]	85abc	1.0a	89bc	1.0a	60abc	1.0a	84bcd
0.6%	2nd date	1.0a	84abc	1.0a	89bc	1.0a	59abc	1.0a	81abcd
0.6%	3rd date	1.0a	88bc	1.0a	89bc	1.0a	56ab	1.0a	83abcd
0.6%	4th date	1.0a	89c	1.0a	83abc	1.0a	57ab	1.0a	83abcd
0.8%	1st date	1.0a	84abc	1.0a	84abc	1.0a	55ab	1.0a	82abcd
0.8%	2nd date	1.0a	80abc	1.1ab	88bc	1.0a	57ab	1.2a	82abcd
0.8%	3rd date	1.2ab	88bc	1.2ab	81ab	1.0a	57ab	1.0a	83abcd
0.8%	4th date	1.3abc	90c	1.2ab	87bc	1.0a	57ab	1.0a	81abcd
1.0%	1st date	1.0a	83abc	1.0a	83abc	1.0a	54ab	1.4a	72ab
1.0%	2nd date	1.0a	81abc	1.4abc	84abc	1.0a	57ab	1.0a	78abc
1.0%	3rd date	1.3abc	85abc	1.8abc	88bc	1.0a	60abc	1.2a	81abcd
1.0%	4th date	1.3abc	88bc	1.8c	89bc	1.0a	56ab	1.0a	74abc
1.2%	1st date	1.0a	73a	1.0a	76a	1.0a	57ab	1.0a	81abcd
1.2%	2nd date	1.0a	85abc	1.6bc	85abc	1.0a	58abc	1.0a	76abc
1.2%	3rd date	1.6bc	89c	1.5abc	81ab	1.0a	55ab	1.0a	77abc
1.2%	4th date	1.8c	86abc	1.8c	76a	1.3a	54ab	1.0a	70a
1.4%	1st date	1.6bc	79abc	1.0a	75a	1.0a	58abc	1.0a	71ab
1.4%	2nd date	1.5abc	78abc	1.4abc	83abc	1.0a	57ab	1.2a	72ab
1.4%	3rd date	1.6bc	75ab	1.5abc	81ab	1.2a	52a	1.0a	70a
1.4%	4th date	1.4abc	77abc	1.8c	87bc	1.3a	54ab	1.0a	78abc
Non-disbudded		1.0a	87bc	1.0a	87bc	1.0a	61bc	1.0a	87cd
Manually disbudded		3.0d	90c	3.0d	92c	3.0b	66c	3.0b	93d

[z]Treatment dates by cv: 'Nob Hill' (14, 16, 18, 20 SD); 'Albatross' and 'May Shoesmith' (16, 18, 20, 22 SD); Imp. Mefo (22, 24, 26, 28 SD). Based on number of days after initiation of short-day (SD) conditions.
[y]Subjective rating of 1-3; 1 = no effect, 2 = 50% of laterals ≤ 2 cm, and 3 = all laterals disbudded or ≤ 2 cm length.
[x]Stem height from basal cut to base of terminal floral receptacle.
[w]Mean separation, within columns, by Duncan's multiple range test, 5% level.

'Albatross.' Most effective treatment was at 1.2% on 22 SD although the terminal peduncle was also stunted. Concn of 1.4% caused the terminal inflorescence to form a crown bud. Variability among plants was too large for any of the treatments to be of practical value.

An effective chemical which disbudded chrysanthemums would reduce production costs. Even if the chemical consistently retarded all but 3-4 of the laterals, it would have practical value. These remaining laterals could be removed manually at a reduced expense. P-293, which was reported to disbud chrysanthemums grown under research greenhouse conditions with a relatively constant temperature and humidity (2, 11, 15), was not effective in Florida when applied to chrysanthemums grown under ambient temp in a polypropylene shade house. A recent report (12) indicated adverse effects of P-293 when applied to mums grown under less than optimum growing conditions. P-293 has too narrow a tolerance range to environmental conditions to be of practical value on chrysanthemums grown in shade structures in Florida.

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EVOLUTION OF A COMMUNICATION TOOL FOR THE TROPICAL FOLIAGE PLANT INDUSTRY[1]

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Abstract. **With rapid expansion of all segments of the foliage plant industry—production, wholesale, retail and related products and service, there was a need to efficiently communicate between those persons producing plants and those purchasing products for resale.**

In the winter of 1974 a proposal was submitted to the Central Foliage Chapter of F.N.G.A. which is now the Florida Foliage Association, Inc., for a foliage buyer's guide. Objectives of the publication were as follows: 1) Develop a general guide for sources of specific plant species and plant sizes; 2) Provide opportunities for more small specialty growers to be recognized for their area of excellence; 3) Improve communication between producers, wholesalers and those buying plants for retail sales and to insure more extensive use of foliage plants in the future; 4) Establish a more uniform system of plant nomenclature using both complete horticultural names and most acceptable common names.

A report of the development and use of the Florida Foliage Buyer's Guide[2] **is provided herein.**

With the rapid increase in popularity in the 1970's of foliage plants as house plants and for interior landscaping, it became evident that certain sectors of the foliage industry were not developing at equal rates. Many potential buyers did not know what plant they were looking for or where to buy it. Growers were not aware of how much of a particular crop was grown or what the most popular container size was.

In 1974, several members of the then Central Foliage Chapter of the Florida Nurserymen and Growers Association and now the Florida Foliage Association proposed the establishment of a communication means between the growers of indoor tropical foliage plants in Florida and buyers throughout the United States. In 1975 the Florida Foliage Buyer's Guide Trust was formed, and the first edition of the Florida Foliage Buyer's Guide was published listing the products of 78 growers. In 1976 the trust was dissolved and the organization became known as the Florida Foliage

[1]Acknowledgement is given to other members of the Board of Directors of The Florida Foliage Buyer's Guide including: Mrs. Jane Rogers, Paul Bellinger, Alan Cone, Jim Ferguson, Florence Little and Will Webb.

[2]The FFBG can be purchased by writing to: The Florida Foliage Buyer's Guide or The Florida Foliage Association, Drawer Y, Apopka, FL 32703. Individual copies are available at a cost of $35.00 and yearly computer updates are available at $15.00 per year.