Viaflo resulting in the largest number of mites per leaf (5.3) and *1* or *3-tube* Viaflo the least (1.9). Aphids on leaves were adversely affected by irrigation applied with 1 or 2 Viaflo tubes.

Literature Cited

1. Poe, S. J. and J. L. Green. 1974. Pest management determinant factors in chrysanthemum culture. *Proc. Fla. State Hort. Soc.* 87: 467-471.
2. ————, ———— and C. I. Shih. 1976. Cultural practices affect damage to chrysanthemums by *Liriomyza sativae* Blanchard. *Proc. Fla. State Hort. Soc.* 89:299-301.
3. ————, ————, R. C. Littell and C. I. Shih. 1977. Cultural management of pest populations in saran house-grown chrysanthemums in pest management in protected cultural crops. Proc. of a Symposium of the XV International Congress of Entomology. ed. F. F. Smith and R. E. Webb. ARS-NE-85 p. 29-40.

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EFFECT OF INSECTICIDES ON POINSETTIA AND ERINNYIS ELLO[1]

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Additional index words. Ello sphinx, poinsettia hornworm, phytotoxicity, chemical control.

Abstract. **No chemical injury to foliage or bracts of 3 cultivars of poinsettia grown in 6-inch pots outside under saran was noted after 8 applications of 4 insecticides. Methomyl (Lannate(R), Nudrin(R)), endosulfan (Thiodan(R)), and acephate (Orthene(R)) gave 100% control of** Erinnyis ello **(L.) (a hornworm) after 1 application while 3 sprays were necessary to achieve this level of control with** Bacillus thuringiensis **var.** kurstaki **Berliner (Dipel WP(R)).**

Two additional tests were completed to further evaluate phytotoxicity. In the first test, 8 insecticides were applied 12 times to 'Annette Hegg Diva' and 'Annette Hegg Supreme' grown in 6-inch pots outside under saran. The foliage of both cultivars was uninjured while the bracts exhibited slight to moderate necrotic spotting from diazinon and slight tip marginal necrosis by trichlorfon (Dylox(R), Proxol(R)) sprays. No injury was observed with B. thuringiensis, **acephate, azinphosmethyl (Guthion(R)), carbaryl (Sevin(R)), endosulfan, or methomyl. In the second test, acephate and methomyl were applied 12 times to 27 poinsettia cultivars grown as above with no phytotoxicity observed. When the plants were moved to a greenhouse and treated 2 additional times, slight to moderate tip necrosis of foliage was evident on all cultivars. Slight to moderate tip and marginal necrosis of bracts was noted for 'Eckespoint Professor Laurie Pink' and 'Mikkel Dawn Rochford' (both insecticides), 'Paul Mikkelson' (methomyl only), and 'Mikkel Fantastic' (acephate only).**

Erinnyis ello (L.), sometimes called the Ello sphinx or poinsettia hornworm, is a major pest of poinsettia grown in Florida. It is particularly prevalent under saran, glass and fiberglass covered structures with open sides and on homeowner's plants. Larvae consume the foliage, leaving mid veins. Small plants can be completely destroyed. No work to control this pest has been reported in Florida.

Richman and Gentile (2) summarized reports of phytotoxicity of pesticides to ornamentals, including poinsettias. In Florida, Poe and Raulston (1) studied the effects of single applications of acaricides and insecticides on mature greenhouse-grown poinsettias. Acephate (Orthene(R)), endosulfan (Thiodan(R)), diazinon, azinphosmethyl (Guthion(R)), tetradifon (Tedion(R)), dimethoate (Cygon(R), Defend(R)) and oxydemeton-methyl (Metasystox-R(R)) were safe on all the poinsettia cultivars tested.

The purpose of this paper is to report the effects of weekly applications of insecticides on poinsettia foliage and bracts and on control of *E. ello.*

Materials and Methods

All tests were conducted outside under saran cloth (25% shade) at the Agricultural Research and Education Center, Bradenton, Florida. Plants were grown from rooted cuttings planted singly in 6-inch pots containing a sand, peat, perlite and vermiculite (2:2:1:1 by volume) soil mixture with 0.41 lb dolomite, 0.18 lb hydrated lime, 0.22 lb superphosphate, 0.57 lb 14-14-14 Osmocote(R), and 0.18 lb Perk(R) added per ft^3. Plants were pinched to 4 nodes about 3 weeks after transplanting.

In Test 1, 'Annette Hegg Dark Red,' 'Annette Hegg White,' and 'Annette Hegg Diva' were transplanted Aug. 14, 1975. Five pots per cultivar per treatment for each of 4 replications were arranged in a split plot design 5 across in a 6 x 72 ft polyethylene plastic lined trough filled with 2 inches of methyl bromide-fumigated Myakka fine sand. Plants were irrigated by 2 Via-flo(R) tubes running the length of the trough. Treatments were applied weekly, beginning Nov. 7, 1975, and terminating Jan. 2, 1976. Plants were inspected for *E. ello* larvae and phytotoxicity on Nov. 11, 17, 26, and Dec. 1. Data were combined for cultivars and transformed ($\sqrt{X} + 0.5$) for analysis.

In Test 2, 'Annette Hegg Diva' and 'Annette Hegg Supreme' were transplanted Aug. 25, 1976. Three pots per cultivar per treatment for each of 3 replicates were arranged in a split plot design 3 across on a Vattex(R) capillary mat covering a 4 ft x 72 ft x 4 in high sand bed covered with polyethylene. Water was supplied by 2 Via-flo tubes positioned under the mat the length of the bed. Eight insecticides were applied weekly from Sept. 14 to Dec. 16 and phytotoxicity evaluated Dec. 21 by comparisons with check plants sprayed with water.

In Test 3, the following cultivars were transplanted Aug. 27, 1976: 'Annette Hegg Diva,' 'Annette Hegg Supreme,' 'Annette Hegg Lady,' 'Annette Hegg Dark Red,' 'Annette Hegg Super Star,' 'Annette Hegg New Pink,' 'Annette Hegg Marble,' 'Annette Hegg White,' 'Annette Hegg Top Star,' 'Annette Hegg,' 'Eckespoint C-1,' 'Eckespoint C-1 White,' 'Eckespoint Reddy Light,' 'Eckespoint Professor Laurie Pink,' 'Small Winter Flame,' 'Paul Mikkelsen,' 'Mikkel Heritage,' 'Mikkel Improved Rochford,' 'Mikkel Super Rochford,' 'Mikkel Vivid Rochford,' 'Mikkel Triumph,' 'Mikkel Pink Rochford,' 'Mikkel Fantastic,' 'Mikkel Im-

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perial,' 'Mikkel White Rochford,' 'Mikkel Dawn Rochford,' and 'Wonder Star.' Acephate and methomyl (Lannate(R), Nudrin(R)) were each applied to 3 plants of each cultivar arranged across beds constructed as in Test 2. Applications were made weekly from Sept. 14 to Dec. 16. The plants were then moved to a greenhouse, sprayed Dec. 23 and 29 and evaluated for phytotoxicity on Jan. 6, 1977. This allowed an evaluation of possible phytotoxic responses under higher temperatures and relative humidity.

Results and Discussion

In Test 1, all insecticides significantly reduced the number of *E. ello* larvae on all sample dates (Table 1). Methomyl, endosulfan, and acephate gave 100% control after 1 application while 3 sprays were necessary to achieve this level of control with *Bacillus thuringiensis* var. *kurstaki* Berliner (Dipel WP(R)). No injury to either foliage or bracts of the 3 cultivars was observed after 8 insecticide applications.

Table 1. Control of *Erinnyis ello* (L.) larvae on poinsettia plants sprayed with insecticides.

Treatment	Lb a.i./100 gal	Avg. no. larvae/15 plants[z]			
		Nov. 10	Nov. 17	Nov. 26	Dec. 1
Acephate 75SP	0.50	0.0a[y]	0.0a	0.0a	0.0a
Endosulfan 50WP	1.00	0.0a	0.0a	0.0a	0.0a
Methomyl 90SP	0.25	0.0a	0.0a	0.0a	0.0a
Dipel WP[x]	0.50	1.3b	0.7b	0.0a	0.0a
Check	—	2.0c	1.3c	1.0b	1.0b

[z]Treatments applied Nov. 7, 14, 21, 28; Dec. 5, 12, 19, 1975; Jan. 2, 1976.
[y]Means within a column followed by the same letter not significantly different at the 0.05 level, Duncan's multiple range test.
[x]Commercial preparation of *Bacillus thuringiensis* var. *kurstaki* Berliner.

Since few or no *E. ello* larvae were present in Tests 2 and 3, no larval counts were made. In Test 2, no chemical injury was observed on either cultivar after 12 applications of *B. thuringiensis,* acephate, azinphosmethyl, carbaryl (Sevin(R)), endosulfan and methomyl. Diazinon produced moderate bract spotting on 'Annette Hegg Diva' and slight spotting on 'Annette Hegg Supreme.' Trichlorfon (Dylox(R), Proxol(R)) caused slight tip and marginal necrosis of bracts of both cultivars.

No injury by acephate or methomyl was observed after 12 applications in Test 3 on any cultivar grown under saran. When the plants were moved to a greenhouse and treated 2 additional times, at least slight tip necrosis of foliage was observed on all cultivars. However, foliage of 'Eckespoint Professor Laurie Pink' and 'Mikkel Triumph' treated with methomyl had moderate tip and marginal necrosis. Bracts of most cultivars were uninjured. However, bracts of 'Eckespoint Professor Laurie Pink' had slight (acephate) or moderate (methomyl) tip and marginal necrosis and those of 'Mikkel Dawn Rochford' (both insecticides), 'Paul Mikkelson' (methomyl) and 'Mikkel Fantastic' (acephate) had slight tip necrosis.

Acephate and methomyl were very effective in controlling *E. ello* larvae on poinsettia and were safe on a large number of cultivars grown outdoors under saran shade cloth. Care should be observed with poinsettias grown in the greenhouse, however. Endosulfan and *B. thuringiensis* were safe on 4 cultivars of poinsettia grown under saran although the latter was not as effective as the former against *E. ello* larvae. Azinphosmethyl and carbaryl did not injure poinsettias under saran whereas diazinon and trichlorfon did.

Literature Cited

1. Poe, S. L., and J. C. Raulston. 1974. Chemical phytotoxicity to mature poinsettia. *Fla. Flower Grower* 11(9):4-5.
2. Richman, S. M., and A. G. Gentile. 1976. Reported phytotoxicity of acaricides and insecticides to ornamentals. *Floragram* 9(3):4-13.

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ACYLALANINES: A NEW CLASS OF SYSTEMIC FUNGICIDES

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Abstract. **CIBA-GEIGY experimental fungicides CGA-38140 and CGA-48988 represent a new type of systemic fungicide which has activity against the soil-borne species of** Pythium **and** Phytophthora **and foliar diseases caused by the downy mildew fungi. Greenhouse and field data have shown the high degree of residual and systemic activity of these compounds at low rates of application. Technical and performance data on these 2 compounds are presented and discussed.**

The chemical control of plant diseases caused by certain fungi in the class Oomycetes has been based to date on the concept of preventive treatments with all their well known limitations. Therefore, the search for chemicals with systemic and curative properties has been a major objective in agrichemical research. CIBA-GEIGY has discovered a new type of systemic fungicide, derived from the acylalanine group, which meets this objective. These fungicides control the soil-borne diseases caused by *Pythium* spp. and *Phytophthora* spp. as well as the downy mildews and late blight. The purpose of this paper is to present the chemistry of CGA-38140 and CGA-48988. Two subsequent papers will be presented on CGA-48988 on ornamentals, therefore this paper will deal with CGA-38140 on ornamentals. Also, some biological data on CGA-38140 and CGA-48988 on other crops will be presented.

Materials and Methods

Our colleagues at CIBA-GEIGY Limited, Basle, Switzerland, determined the chemical and toxicological properties of CGA-38140 and CGA-48988 (2). All efficacy tests reported here were conducted at CIBA-GEIGY research facilities in Vero Beach and Boynton Beach, Florida.

The control of root rots of carnation caused by *Pythium aphanidermatum* and of pepperomia caused by *Phytophthora parasitica* were tested with CGA-38140 50WP applied as a drench (1 pint/square foot) to potted plants. Inoculum