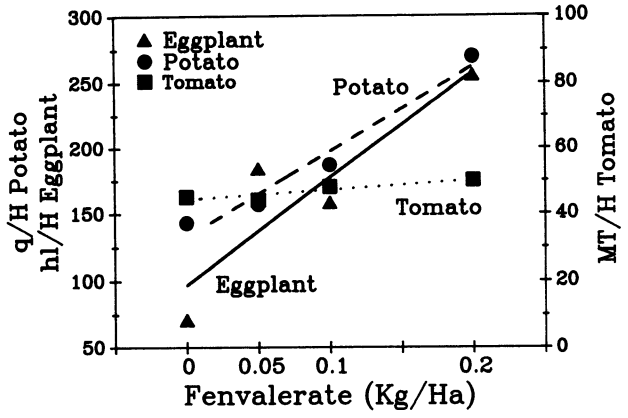

Fig. 2. Regression of average 1984 and 1985 combined yield (Y) of eggplant (hl/H), potato (q/H) and tomato (t/H) on fenvalerate (Fv) concentrations applied to each crop at Bridgeton, N.J. Eggplant (▲): Y = 97 + 807Fv, r = +0.903*; Potato (●): Y = 132 + 654Fv, r = +0.98**; and Tomato (■): Y = 45 + 0.1Fv, r = +0.54^{NS}.

tion on the foliage, which were not examined in this study. Regardless of cause, fenvalerate was often less effective in reducing the CPB population on tomato than on eggplant, and had little effect on tomato yield. Thus, the perception of improved CPB control by fenvalerate on tomato is more likely due to the lower abundance of CPB larvae on this crop and to the lack of effect on small CPB populations on tomato yield, rather than to increased fenvalerate efficacy. However, this experiment may not be representative of crop differences in CPB control where large monocrop acreages are grown and CPB population size may be greater on tomato and eggplant, or in cases where another pesticide is employed.

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Asparagus Crown Response to Dikegulac

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Abstract. **Dipping asparagus crowns (*Asparagus officinalis* L.) in 300 ppm dikegulac (Atrinal) solution significantly reduced the time of emergence and the height of asparagus shoots without affecting their fresh and dry weights. The number of shoots at complete emergence was not affected by the dikegulac treatment, but thereafter a significant increase occurred. Of the concentrations tested (0, 200, 300, and 400 ppm), 300 ppm was the most effective. After the top was cut off, the dikegulac treatment did not affect the time of emergence of the second shoots, but it did continue to increase their number. Chemical name used: 2,3:4,6-bis-*O*-(1-methylethylidene)-α-L-*xylo*-2-hexulofuranosonic acid (dikegulac).**

Technical advances have been made in direct seeding and seedling methods of establishing asparagus fields. However, crown transplanting is still used extensively. Due to "positional dominance", emergence of shoots is progressive and may continue late into the fall, until the bud growth is stopped by low temperature. By analogy to apical dominance, in positional or lateral dominance, the presence of shoots on rhizomes, tubers, or crowns suppresses the emergence of proximal dormant buds.

Depending on the number of buds present, the age of the plants, and the environment, five to 15 shoots or more may emerge from the crown. The sequential emergence of shoots is particularly strong during the harvest period. This growth characteristic makes the harvesting time-consuming and labor-intensive. It also represents one of the constraints to mechanical harvesting. Therefore, a chemical that would stimulate simultaneous emergence of asparagus shoots has great potential for practical use. Wittwer and Bukovac (14) suggested the use of gibberellins (GA) to overcome positional dominance in asparagus. Tiburcio (11), using GA drenches at 10 ppm, obtained an increase in number, diameter, weight, and length of new shoots, but, in another study, soaking the crowns in 1000 ppm KGA (Gibrel) solution did not increase the number of shoots per crown under field conditions (6). Benson (1) reported that (2-chloroethyl)phosphonic acid (ethephon) drenches were ineffective in overcoming positional dominance in asparagus. However, dipping the crowns in 750 to 1000 ppm of ethephon increased the number of shoots per crown (6). Dipping sweet potato roots in ethephon solutions also increased the number of shoots per root, thus suggesting the elimination of positional dominance (12, 13). Dikegulac, a commercially available systemic growth regulator, was effective in inhibiting apical dominance in pecans (7), azalea (3, 10), and cane cuttings of *Dracaena fra-*

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Table 1. Effect of dikegulac treatment of asparagus crowns on shoot emergence and growth.

Dikegulac (ppm)	Time of emergence (days)	No. shoots at complete emergence	No. shoots after emergence (weeks)			Terminal growth of shoots		
			2	4	6	Height (cm)	Fresh wt (g)	Dry wt (g)
0	10.6 ± 0.60[z]	1.5 ± 0.46	2.5 ± 0.37	2.8 ± 0.43	3.4 ± 0.63	83.4 ± 5.44	25.4 ± 1.44	6.3 ± 0.37
100	10.5 ± 0.98	2.2 ± 0.53	2.7 ± 0.54	2.9 ± 0.51	3.4 ± 0.61	84.8 ± 2.96	22.3 ± 2.31	6.4 ± 0.53
200	7.6 ± 0.90	1.6 ± 0.21	2.2 ± 0.25	2.4 ± 0.21	3.0 ± 0.23	82.0 ± 3.84	23.1 ± 2.08	6.2 ± 0.65
300	6.9 ± 0.40	2.4 ± 0.47	4.0 ± 0.67	4.6 ± 0.71	5.7 ± 0.75	63.5 ± 5.38	21.5 ± 2.96	6.1 ± 0.83
400	9.8 ± 0.69	2.1 ± 0.43	2.7 ± 0.54	3.2 ± 0.61	3.8 ± 0.67	75.3 ± 3.65	23.1 ± 2.63	6.1 ± 0.74

[z]Mean ± SE.

Table 2. Residual effect of dikegulac treatment of asparagus crowns on shoot emergence.

Dikegulac (ppm)	Time of emergence (days)	No. shoots after emergence (weeks)				
		0	3	6	9	12
0	6.2 ± 0.28[z]	2.0 ± 0.41	2.0 ± 0.34	2.8 ± 0.68	4.5 ± 1.03	4.8 ± 1.15
100	5.8 ± 0.28	1.9 ± 0.25	1.8 ± 0.22	2.3 ± 0.31	4.3 ± 0.43	4.3 ± 0.43
200	6.1 ± 0.29	1.5 ± 0.31	1.6 ± 0.24	2.1 ± 0.37	4.7 ± 0.78	4.8 ± 0.75
300	6.6 ± 0.52	3.1 ± 0.40	3.2 ± 0.61	5.0 ± 0.78	8.8 ± 1.22	9.7 ± 1.20
400	6.2 ± 0.28	2.1 ± 0.34	2.0 ± 0.32	3.1 ± 0.66	5.0 ± 0.92	5.2 ± 0.47

[z]Mean ± SE.

grans (5). Some studies also proved it to be more effective than hand-pinching in suppressing apical dominance in tomato (4) and pepper (8) by increasing lateral branching.

The objectives of this investigation were to determine the effects of dikegulac on the positional dominance in asparagus crowns and on growth of shoots after cutting the ferns.

Healthy and uniform 1-year-old crowns of 'Mary Washington' asparagus with 10 to 12 dormant buds were chosen. They were washed and disinfected for 5 min in a solution of *N*-(2,6-dimethylphenyl)-*N*-(metoxyacetyl)-DL-methyl ester (metalaxyl) (ridomil). After drying at room temperature, the crowns were held for 15 min in an aqueous solution of dikegulac sodium at 100, 200, 300, and 400 ppm. Tap water was used as a control. These concentrations were chosen because in preliminary experiments dipping 2-year-old crowns in dikegulac solutions at 500 ppm or above stimulated an abundant emergence of shoots, but they were clorotic and/or stunted. They eventually collapsed, thus preventing any long-term observations. Each treatment was replicated 13 times, with one crown per replication. The crowns were planted in a Pro-mix medium consisting of 60 peatmoss : 20 perlite : 20 vermiculite (by volume) in 30-cm pots. The experiment was conducted in a greenhouse with 25° day and 15°C night temperatures, from Oct. 1984 through Mar. 1985. Treatments were arranged in a randomized complete block design. Data on time of emergence of first shoots were recorded daily until all crowns had produced at least one shoot. Cumulative data of the number of shoots emerging from each crown before all crowns had sprouted were collected on the day the last crown had produced at least one shoot and every week thereafter. For convenience, however, the data are reported for 2-week periods. Six weeks after complete emergence, the first phase of the experiment was terminated. The plants were cut at the soil level and the length and fresh and dry weights of the shoots were measured.

The second shoot emergence after the ferns were cut off at the ground level constituted the second phase of the experiment. The data were recorded for 12 weeks, but, for convenience, they are reported for 3-week periods.

Results for the first phase are summarized in Table 1. Unlike the report that dikegulac delayed budbreak in pecan (7), in this study it reduced the time of emergence of the shoots. It did not affect the number of shoots at complete emergence, but its effects thereafter were significant. Of the concentrations tested, 300 ppm was the most effective. It did not affect fresh and dry weight, but, in accordance with existing reports (7, 9), it reduced shoot growth by affecting the height.

In the second phase, dikegulac had no effect on the time of shoot emergence (Table 2). However, as in the first phase, it increased the number of shoots, thus suggesting a lasting suppression of positional dominance. This result supports the reported systemic character of this chemical (2). The effect of dikegulac treatment on promoting spear emergence for harvesting purpose remains to be demonstrated under field and greenhouse conditions.

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