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PRELIMINARY RESULTS OF SPRAYING 2,4-D ON YOUNG CARNATION PLANTS

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The extensive use of herbicides in agriculture has increased the possibilities of environmental contamination. One of the most widely used herbicides is 2,4-D (2,4-dichlorophenoxyacetic acid). 2,4-D, a growth regulator type herbicide, is a derivative of the phenoxyaliphatic acids. These acids comprise a major group of organic herbicides because of their selectivity and ability to be translocated in plants.

Aerial applications of 2,4-D to fields and lawns has injured susceptible plants in adjacent areas. In Iowa approximately five million acres of corn are sprayed once a year with $\frac{1}{2}$ -1 lb. of 2,4-D per acre. As a result, there are frequent reports of herbicide damage to susceptible plants which have not been directly treated. Aerial applications of 2,4-D and 2,4-D/dicamba to barley fields in southern Colorado have injured the surrounding lettuce fields. Carnation growers in Colorado have received herbicide damage on their carnations from aerial drift. Little is known about the specific symptoms and the ultimate effect on the value of carnations.

Data is needed for the grower to determine in as short a time as possible, whether or not his crop is contaminated and to what extent it will effect the crop's value.

Methods

As a preliminary trial 2,4-D in the amine form was used at three concentrations; $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ lb. ai/A and sprayed on carnation plants at two, four and six weeks after pinch (March 17, March 31, and April 14). There were six plants

per treatment, a total of ten treatments. A stationary nozzle chamber sprayer was calibrated to spray 24 gal/A (recommended) using a fan shaped nozzle tip #800067. Observations continued through June 5. Data recorded on June 5 consisted of: number of branches per plant, number of vegetative breaks per branch, number of reproductive breaks per branch, number of nodes per branch, the length of each branch, the diameter of the terminal bud and plant dry weights.

Results

Table 1 shows the number of vegetative and reproductive shoots per branch. After 2,4-D was applied, breaks became reproductive rather than vegetative.

Table 1. Average number of vegetative and reproductive shoots per branch when sprayed with 2,4-D 2, 4 and 6 weeks after pinch.

	2 wks		4 wks		6 wks	
	veg	repro	veg	repro	veg	repro
Control	3	2	3	2	3	2
$\frac{1}{8}$ lb ai/A	0	4	0	4	0	3
$\frac{1}{4}$ lb ai/A	0	4	0	3	0	4
$\frac{1}{2}$ lb ai/A	0	3	0	4	0	7

The mean length per branch increased after applying 2,4-D at two weeks after pinch for all three concentrations; $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ lb ai/A. At four and six weeks after pinch applying 2,4-D at any concentration did not significantly increase the length of the branches.

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Figure 1 shows the results of total plant dry weights. Plant weights decreased with increasing concentrations of 2,4-D.

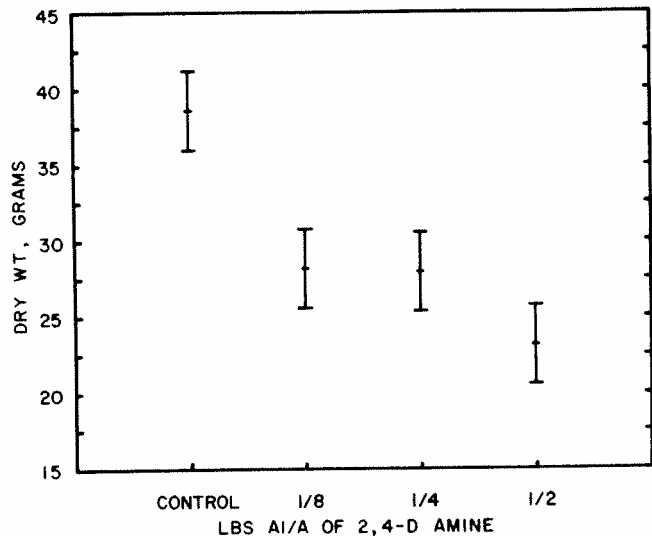


Fig. 1: Average dry weights of carnation plants sprayed with 2,4-D (Amine) 2, 4 and 6 weeks after pinch.

The number of branches per plant, the number of nodes per branch and the diameter of the terminal bud did not differ significantly from the control. However, the terminal buds of plants treated two and four weeks after pinch with $\frac{1}{2}$ lb ai/A of 2,4-D were enclosed within a leaf sheath (Figure 2).



Fig. 2: Terminal buds of plants treated at two and four weeks after pinch with $\frac{1}{2}$ lb ai/A of 2,4-D.