

research bulletin

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DWARF CARNATION RESPONSE TO SOIL APPLICATIONS OF SUMAGIC™

Anna K. Pobudkiewicz and Kenneth L. Goldsberry¹

"Redcloud" dwarf carnation plants were drenched once with Sumagic™ solutions of either 0, 0.0125, 0.025, 0.050, 0.075, 0.1, 0.125, 0.150 or 0.175 mg a.i. per 4-inch pot when lateral shoots were 3 to 4 inches in length. All Sumagic™ treated plants were significantly shorter than the control treatment. Plants treated with 0.075, 0.1 and 0.125 mg a.i. of Sumagic™ were in the desired height range of 16 to 18 cm at flowering time. The residual life of uniconazole in the soil, when used as a drench, is apparently extensive.

INTRODUCTION

The new Colorado Majestic Mountain™ dwarf carnation pot plants have been the object of growth regulator studies at Colorado State University since 1987. The first research determined the proper stage of plant growth for growth retardant application (3). Further studies including applications of triazole compounds Sumagic™ and Bonzi™ determined the optimum doses of chemicals to apply in order to obtain short compact dwarf carnation plants (4,5,6). Early 1989 studies showed that there were no significant height differences in plants treated with similar doses of Sumagic™ or Bonzi™ (5). Recent research on dwarf carnations indicated that height differences were not evident when Sumagic™ was sprayed as a single concentrated dose or small multiple doses (6). Other experiments indicated that Cycocel™ was not as effective in retarding the growth of the dwarf carnations as Sumagic™ or Bonzi™ and should probably not be used (7).

The objective of this experiment was to evaluate the effect of Sumagic™ as a drench on Majestic Mountain™ carnations, which completes our studies on this new triazole compound and newly introduced flowering pot plant product.

MATERIALS AND METHODS

Rooted cuttings of the dwarf carnation 'Redcloud' were planted in 4-inch plastic azalea pots using a medium con-

sisting of 1 soil, 3 Sphagnum peat, 2 No. 6 perlite (v:v:v) and spaced on a bench 2 inches apart on 11 October 1988. Approximately 10 days after the cuttings were established, the plants were pinched and three to four lateral shoots allowed to develop. The plants were grown in a fiberglass covered greenhouse heated to 54F night and 62F day, in an atmosphere enriched with 600 to 1000 ppm CO₂ during daylight hours, and fertilized (2) at each watering with 200 ppm N, 30 ppm P and 220 ppm K. Pesticide applications were made as needed.

Dwarf carnation plants with multiple shoots averaging 3 to 4 inches in length were drenched with Sumagic™ solutions of 0, 0.0125, 0.025, 0.050, 0.075, 0.1, 0.125, 0.150 or 0.175 mg a.i. per plant on 11 January 1989. The experiment was terminated on 15 March 1989, the average date when one flower was fully open and at least two buds showing color. Data included plant height, time to flowering and flower diameter. Plant height was measured from the point of the pinch to tip of the apical flowers. The original flowering stems were removed from a small sample of plants treated with 0.1 mg or more uniconazole after all terminal flowers had opened, in order to observe growth retardant influence on the second flush of developing shoots. The statistical design was a Randomized Block with four replications having 7 plants each.

RESULTS

Dwarf *Dianthus caryophyllus* plants in all single uniconazole soil treatments were significantly shorter than the untreated plants at flowering time (Fig. 1). Plants treated with uniconazole doses of 0.0125, 0.025 and 0.05 were in the height range of 20 to 25 cm, but did not satisfy require-

¹Visiting Scientist, Research Institute of Pomology and Floriculture, Skierniewice, Poland, and Professor, Colorado State University, respectively.

ments of a mini pot plant (1,4,5,6). Those treated with 0.075, 0.1 and 0.12 ppm uniconazole were in the desired height range of 16 to 18 cm. Plants treated with 0.15 and 0.175 ppm uniconazole had heights of 14 to 15 cm, respectively, which were inhibited too much. The stems of plants treated with doses of 0.1 ppm and greater were epinastic (**Fig. 2**). The most desirable uniconazole soil treatment was 0.075 ppm per plant (**Fig. 3**). No shoot bypass was observed on any uniconazole treated plants during flowering time.

The uniconazole treated plants that were "re-pinned" after all original main stems had flowered, developed a second "flush" of flower shoots. The resulting shoots were almost identical in length to the original stems, creating compact plants in similarly described height ranges. All stems of plants treated with 0.1 ppm or more uniconazole continued to be epinastic. The results suggest that applications of uniconazole as a soil drench are extremely residual in nature, and effect plant growth for a long period of time.

There was no delay in the time to flower between uniconazole treated and untreated plants and the flower diameter did not differ.

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Figure 2. The average plant height response of dwarf carnation 'Red Cloud' at flowering time due to soil drench treatments of Sumagic™ solutions 0, 0.0125, 0.025, 0.050, 0.075, 0.1, 0.125, 0.15, and 0.175 mg a.i. per 4-inch pot (L to R).

UNICONAZOLE SOIL DRENCH
DWARF CARNATION 'REDCLOUD'

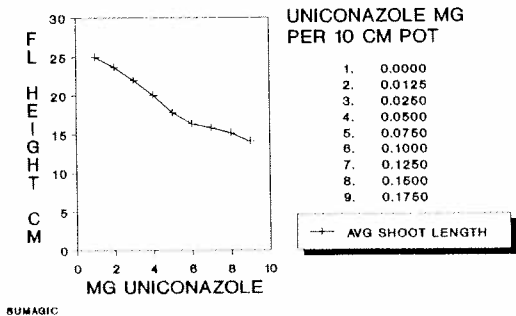


Figure 1. The dwarf carnation 'Redcloud' treated with uniconazole solutions of either 0, 0.0125, 0.025, 0.05, 0.075, 0.1, 0.125, 0.15, or 0.175 mg per plant.



Figure 3. Dwarf carnation 'Redcloud' treated with a soil drench of 0.075 mg uniconazole (R) and untreated plant (L).