

Research Progress Report : The Effect of B-Nine, Bonzi, and Sumagic on the Growth of Ornamental Cabbage and Kale

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James L. Gibson and Brian E. Whipker¹
Dept. of Horticultural Science, Box 7609
North Carolina State University
Raleigh, NC 27695-7609

Significance to the Industry: Chemical growth regulators are required to control plant height of ornamental cabbage and kale. Sumagic foliar sprays between 2 and 8 ppm were effective in controlling height at a cost of \$0.004 and \$0.02 respectively. B-Nine at 2500 ppm also provided comparable control in limiting unnecessary stretch, with a cost of \$0.004 per pot as a single application or \$0.01 when sprayed twice. A B-Nine rate of 5000 ppm is also recommended at a cost of \$0.01 per pot. Although effective in controlling height, it is not economically feasible to apply Bonzi or Sumagic as drenches, because the costs are 3 to 6 times that of Sumagic foliar sprays or B-Nine foliar sprays.

Nature of Work: Ornamental cabbage and kale plants are attractive landscape additions for the fall and early winter garden. Due to their 10 to 12 week production time during periods of warm temperatures, growers face the challenge of maintaining a short, yet robust plant, which will look proportional to the pot size. Plant growth regulators (PGRs) are commonly applied to container grown plants to limit stem elongation and produce a more compact plant (3). Current PGR recommendations are to use multiple B-Nine sprays of 1500 to 3000 ppm (1,2). Whipker et al. (4) found foliar applications of Sumagic at

5 ppm or B-Nine at 2500 or 5000 ppm had the greatest effect on controlling plant height of two ornamental kale cultivars, and Bonzi had little effect, however a limited range of rates were used. Determining the optimal Bonzi or Sumagic foliar spray or drench rates would offer other options for controlling ornamental cabbage and kale plant growth.

Ornamental cabbage and kale plugs of cultivars 'Osaka White' and 'Nagoya Red' were potted into 8 inch round plastic containers on August 20, 1998. The root substrate was Fafard 4-P (Fafard, Anderson, SC), and the plants were fertilized at each watering with 200 ppm N. Thirteen PGR foliar sprays (in ppm) were applied 22 days after potting (using a volume of 0.5 gallons per 100 ft² [204 mL·m⁻²]): Bonzi at 5, 10, 20, 40, or 80; Sumagic at 2, 4, 8, 16 or 32; B-Nine at 2500, 2500 (twice, with the second application occurring 14 days later), or 5000 ; and an untreated control. Ten PGR drench treatments (in mg a.i./pot) were also applied 22 days after potting (using a volume of 10.1 oz [300 mL] of solution per pot): Bonzi at 1, 2, 4, 8, or 16; and Sumagic at 0.125, 0.25, 0.5, 1, or 2. The experiment was a completely randomized block design with five single-plant replications of the 24 treatments. On November 1, total plant height (measured from the pot rim to the top of the foliage), plant diameter and color diameter (all diameters measured at the widest dimension and turned 90°, and averaged) were recorded.

¹ Graduate Research Assistant and Assistant Professor of Floriculture, respectively.

Results and Discussion

'Osaka White' plant height was shorter as the Bonzi substrate drench rates increased, while 'Nagoya Red' plant height had no additional control at rates \bullet 4 mg. 'Osaka White' is a more vigorous cultivar with the untreated control plants being 10% taller than 'Nagoya Red'. Optimal rates of Bonzi substrate drenches would be 4 to 8 mg for vigorous cultivars like Osaka White' or 2 to 4 mg for less vigorous cultivars like 'Nagoya Red'.

All doses of the Sumagic substrate drenches significantly controlled plant height of 'Osaka White' and 'Nagoya Red', with both cultivars having no additional response as Sumagic rates increased \bullet 1 mg. Optimal rates of Sumagic substrate drenches would be 0.25 to 1 mg for vigorous cultivars like 'Osaka White' or 0.25 to 0.5 mg for less vigorous cultivars like 'Nagoya Red'.

Bonzi foliar sprays at concentrations of up to 80 ppm were ineffective in controlling plant height of 'Nagoya Red'. 'Osaka White' exhibited a positive response of greater plant height as the Bonzi foliar spray rate increased.

Increasing the Sumagic foliar spray rates resulted in a smaller plant height for both 'Osaka White' and 'Nagoya Red'. Optimal rates of Sumagic foliar sprays would be 2 to 8 ppm for either 'Osaka White' or 'Nagoya Red' to produce marketable plants.

B-Nine foliar sprays of 2500, 2500 (applied twice), or 5000 ppm resulted in 'Osaka White' and 'Nagoya Red' plants which were \bullet 12% shorter than the control. The B-Nine foliar sprays gave height control comparable to Sumagic foliar sprays of 2 to 8 ppm.

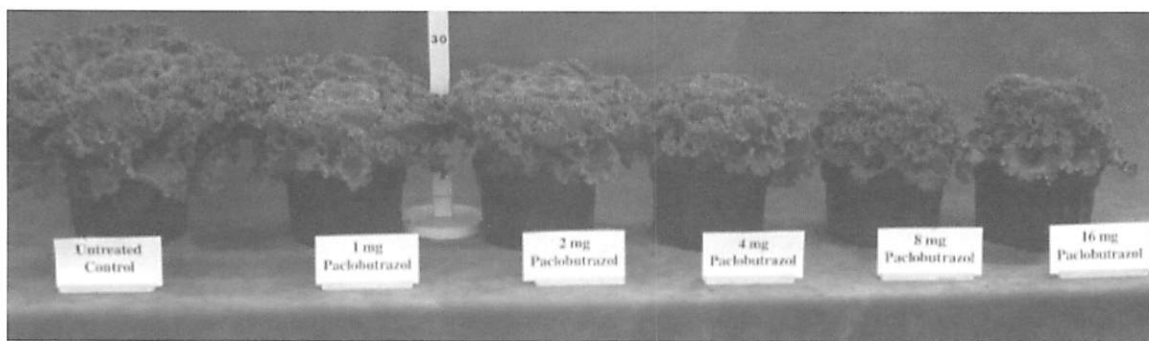
Conclusion

Chemical growth regulators are required to control plant height of ornamental cabbage and kale. Sumagic foliar sprays between 2 and 8 ppm were effective in controlling height at a cost of \$0.004 and \$0.02 respectively. B-Nine at 2500 ppm also provided comparable control in limiting unnecessary stretch, with a cost of \$0.004 per pot as a single application or \$0.01 when sprayed twice. A B-Nine rate of 5000 ppm is also recommended at a cost of \$0.01 per pot. Although effective in controlling height, it is not economically feasible to apply Bonzi or Sumagic as drenches, because the costs are 3 to 6 times that of Sumagic foliar sprays or B-Nine foliar sprays.

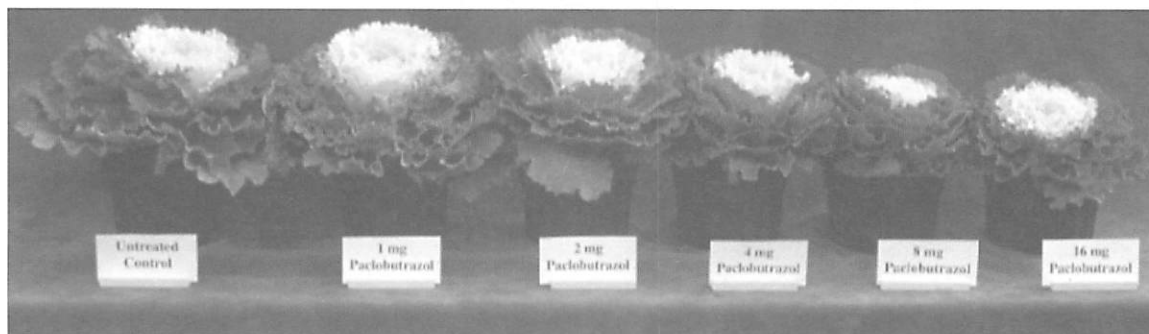
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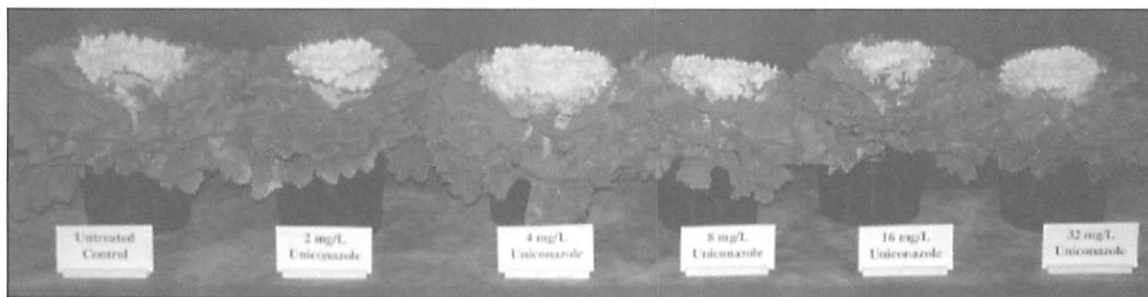
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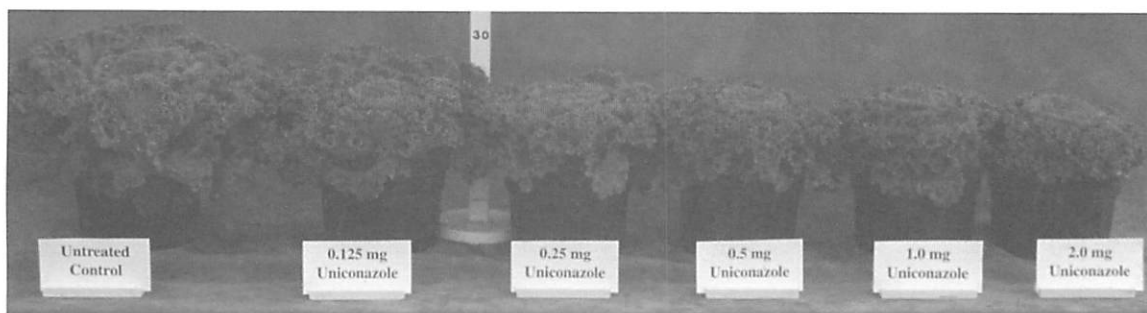
The effect of Bonzi substrate drenches on the growth of 'Nagoya Red' ornamental kale (left to right: 0, 1, 2, 4, 8, or 16 mg).



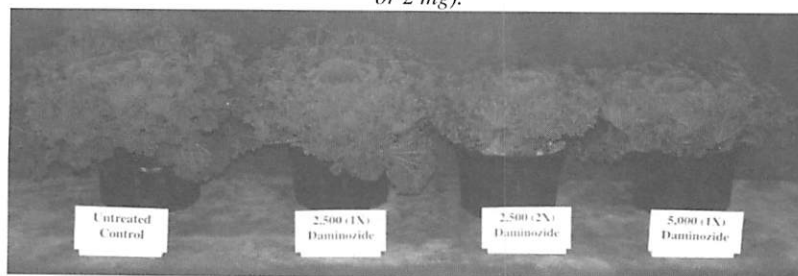
The effect of Bonzi substrate drenches on the growth of 'Osaka White' ornamental cabbage (left to right: 0, 1, 2, 4, 8, or 16 mg).



The effect of Sumagic foliar sprays on the growth of 'Osaka White' ornamental cabbage (left to right: 0, 2, 4, 8, 16, or 32 ppm).



The effect of Sumagic substrate drenches on the growth of 'Nagoya Red' ornamental kale (left to right: 0, 0.125, 0.25, 0.5, 1, or 2 mg).



The effect of B-Nine foliar sprays on the growth of 'Nagoya Red' ornamental kale (left to right: 0, 2500, 2500 [twice] or 5000 ppm).