Use of Uniconazole to Control Height of Hibiscus rosa-sinensis

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Production of hibiscus commonly includes chloromequat chloride application to induce shortened plant internodes and to darken green leaves (Wilkins and Kotechi, 1985), but its application has been reported to reduce flower size and flower number of some cultivars (Ball, 1985). Therefore, we evaluated the effectiveness of (E)-(p-chlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-pentene-3-ol (uniconazole) for control of plant height, width, leaf distortion, and the number of breaks (vegetative shoots produced from lateral buds) per plant on hibiscus.

Rooted cuttings of Hibiscus rosa-sinensis L. 'Brilliant' (Ball Seed Co., West Chicago, Ill.) were selected for uniformity and potted into 1.5-liter (15-cm) polyethylene containers on 18 Apr. 1988. The potting medium, 1 sphagnum peat:1 vermiculite (v/v), was amended with 4.5 kg dolomitic limestone/m³, 1.8 kg Ca(NO₃)₂/m³, and 170 g fritted trace elements/m³ (W.R. Grace and Co., Fogelsville, Pa.). The plants were fertilized weekly with 200 mg N/liter (20N-8.6P-16.6K) at each irrigation.

Plants were pinched (terminal buds removed to first node) and flower buds were removed 23 May 1988. The plants were sprayed with uniconazole on 13 June 1988 at 0, 10, 15, or 20 mg a.i./liter. The spray coverage rate was 0.2 liter-m⁻². Ten plants were treated at each of the given rates, each representing an observation.

Data were collected on 29 Aug. 1988, 77 days after treatments were applied, at which time all hibiscus plants were in full flower. Characteristics measured included plant height (from the potting medium surface) and width (the average of two measurements taken perpendicular to each other), stem length, leaf distortion, number of breaks, and days to flower.

Height of hibiscus plants were reduced by all application rates of uniconazole, with the main effect on height occurring at rates <15 mg-liter⁻¹ (Fig. 1A). Plant width was reduced linearly for each unit increase in concentration (Fig. 1B). Leaf distortion and the number of breaks increased with increasing application rates of uniconazole (Fig. 1 C and D). Uniconazole decreased stem length, but did not affect the number of days to flower (data not shown). Hibiscus plants required an average of 59 days to flower from potting, regardless of treatment.

Maximum reduction in plant height occurred with uniconazole at 15 mg-liter⁻¹, but not desirably so. Leaf distortion also reached its maximum at 15 mg-liter⁻¹ (Fig. 1C). All plants treated with 10 mg-liter⁻¹ were of high quality with minimal levels of distortion and curling, whereas plants treated with 15 and 20 mg-liter⁻¹ were severely distorted and of poor quality.

Maximum number of breaks within the range of uniconazole application levels was not determined in this study. The number of breaks at 10 mg-liter⁻¹ (9.9 vs. 5.8, control) significantly contributed to the fullness and overall quality of the plant. The number of breaks with uniconazole applications >10 mg-liter⁻¹ probably represented disruption of apical meristem development, resulting in lateral budbreak with little internode elongation.

Considerable variability was observed for plant width (Fig. 1B), which was due, at least in part, to the loose branching habit of hibiscus. Uniconazole at 10 mg a.i./liter desirably controlled height of greenhouse-grown Hibiscus rosa-sinensis with minimal injury and offers a promising method for height control and plant quality improvement.

Literature Cited

Fig. 1. Effect of uniconazole on Hibiscus rosa-sinensis 'Brilliant': (A) plant height, (B) plant width, (C) leaf distortion and curling (1 = no distortion to 10 = severe), and (D) number of breaks. All effects were significant at P = 0.0001. Vertical bars represent SE of the individual treatment means (n = 10).