

Growth of Vinca as Affected by Form of Nitrogen, Presence of Bark, and Type of Micronutrients.

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Nature of Work: The 1991 and 1992 growing seasons were marked by numerous reports of poor growth of vinca. Reasons given for this poor growth ranged from conditions being too wet or too cold, to poor genetic vigor in new cultivars, despite numerous reports of excellent quality vinca grown by nearby growers using the same cultivar.

Recently, we have found that vinca do not respond well to high levels of nutrient charge in soilless medium (1). Many bark-based soil mixes used in southern states contain fairly high levels of soluble salts, trace elements and urea formaldehyde as the nitrogen source (1,5). Cultural recommendations include growing plants with minimal water application, thus maximizing salt, pH and nitrogen effects (1,2,3).

The objective of this study was to ascertain if any of the above materials might by itself retard growth of vinca. Plugs of vinca 'Grape Cooler' were grown according to standard methods. Main plot treatments consisted of planting plugs in a peat-lite mix or a 25% bark mix both manufactured by the same company. The effect of trace elements was tested by planting vinca plugs in the peat-based medium left uncharged without pH adjustment to 5.5, or prepared with sulfate-based micronutrients, chelate-based nutrients, or in sulfate or chelate-based soil mix pH adjusted to 5.5.

The effect of nitrogen source was tested by growing vinca in sand culture and fertilizing biweekly with a modified Hoagland and Arnon's nutrient solution (100 ppm N) where ratios of nitrate to ammonium was adjusted from 0% nitrate / 100% ammonium nitrogen to 100% nitrate / 0% ammonium. Split-plot designs were incorporated with three plants per each of six replications.

Results and Discussion: Presence of pine bark in medium significantly reduced stem length, stem dry weight, and root dry weight (Table 1). Analysis of the effect of nutrient source in the peat-lite mix revealed that stem length was greater when sulfated micro-elements or standard chelated nutrients in medium adjusted to pH 5.5 were used (Table 2). Shoot dry weight of vinca grown in sulfated nutrients or in chelate based/pH 5.5 medium was significantly

higher than that of other treatments. Vinca grown in sulfate-based/pH 5.5 medium exhibited significantly greater root dry weight than did plants from the other four treatments. Root dry weights were not significantly different between other treatments.

Vinca grown in sand and fertilized with half-strength Hoagland's solution containing various ratios of nitrate and ammoniacal nitrogen showed optimal stem length at 75 and 100% nitrate levels (Table 3). Optimal shoot dry weight was obtained from vinca grown in the 100% nitrate treatment. Root dry weight was also significantly reduced as percentage of ammonium increased. Visual assessment of roots showed a dramatic reduction in the size and volume of roots as ammonium levels increased.

Significance To The Industry: Our data suggest that some growth problems associated with vinca are due to production inputs. Our data show that even 25% bark, non-pH adjusted media with standard chelated micro-elements or ammoniacal nitrogen ratios higher than 1:3 may cause growth reductions. Avoiding these materials may increase chances of better vinca crops next spring.

Literature Cited:

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TABLE 1. EFFECT OF MEDIUM SOURCE ON GROWTH OF VINCA MEDIUM

Soil Medium	Shoot Length (cm)	Shoot Dry Wt. (mg)	Root Dry Wt. (mg)
Peat-Lite Mix	14.5 a	1588 a	178 a
25% Bark Mix	12.9 b	1459 b	145 b

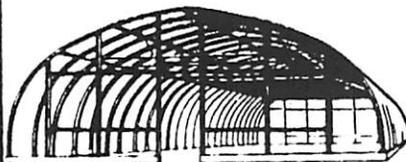
TABLE 2. EFFECT OF MICRONUTRIENT SOURCE ON GROWTH OF VINCA GROWN IN PEAT BASED MEDIUM

Micronutrient Source	Shoot Length (cm)	Shoot Dry Wt. (mg)	Root Dry Wt. (mg)
Sulfated Micros	15.41 a	1724 a	183.4 b
Chelated Micros	13.75 b	1550 b	183.8 b
Chelated/pH 5.5	15.13 a	1751 a	167.4 b
Sulfated/pH 5.5	13.78 b	1611 b	219.0 a
Control (none)	13.61 b	327 c	176.8 b

TABLE 3. EFFECT OF NITRATE/AMMONIUM RATIO ON GROWTH OF VINCA IN PEAT BASED MEDIUM

Nitrogen Ratio (%)	Shoot Length (cm)	Shoot Dry Wt. (mg)	Root Dry Wt. (mg)
0 NO ₃ : 100 NH ₄	7.6 d	378 e	138 c
25 NO ₃ : 75 NH ₄	7.9 c	847 d	244 b
50 NO ₃ : 50 NH ₄	11.0 b	1089 c	312 b
75 NO ₃ : 25 NH ₄	12.0 a	1285 b	411 a
100 NO ₃ : 0	12.3 a	1458 a	474 a

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