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Influence of Medium pH on Growth of 'Roosevelt' Ferns¹

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Abstract. In greenhouse studies, maximum growth of *Nephrolepis exaltata* (L.) Schott 'Rooseveltii' was obtained in an acid (pH 4-5) medium. Dry weight of ferns decreased as pH of the medium increased.

Nurserymen commonly mix peat moss with perlite, then add a liming material to adjust pH for ferns and other tropical plants. Graf (1) suggests that a loam, clay or garden soil, with decayed manure and up to one-third peat moss or humus, provides conditions for optimum fern growth response, and that agricultural lime may be added to provide aeration and drainage to a medium containing clay particles. Hoshizaki (3) recommends lime or sulfur as an amendment to achieve a desired pH 6-7. However, Poole and Conover (4) reduced yields of leatherleaf fern with dolomite application. The present study was conducted to determine the influence of medium pH on growth of 'Roosevelt' fern.

Hydrated lime treatments consisting of 0, 0.75, 1.5, 2.25 and 4.5% (by air

dry weight) were thoroughly mixed with a 1 peat:1 perlite mix (by volume) to obtain a range of pH values. *Nephrolepis exaltata* 'Rooseveltii' were planted, 1 plant per 15 cm pot, in each treatment and watered. The lime treatments were replicated 4 times. The plants were watered twice weekly with a solution containing 1.3 g/liter of 15N-6P-12K fertilizer with micronutrients. Day length ranged from 14.1 to 10.4 hr with light intensities ranging from 21.6 to 32.4 klx. Greenhouse temperatures were 20-35°C. The first 250 ml of effluent passing through each pot after watering was collected and pH of the effluent determined. This has been shown to be a good indicator of the pH status of peat: perlite medium (2). At termination of the experiment, the plants were cut 2 cm above the medium and oven dry weights of fronds obtained.

Maximum fern growth in this study was obtained from nonlimed or very low (0.75%) lime rates that resulted in pH values of 4 to 5. Increasing lime rates increased pH and reduced fern growth (Fig. 1). The medium pH values

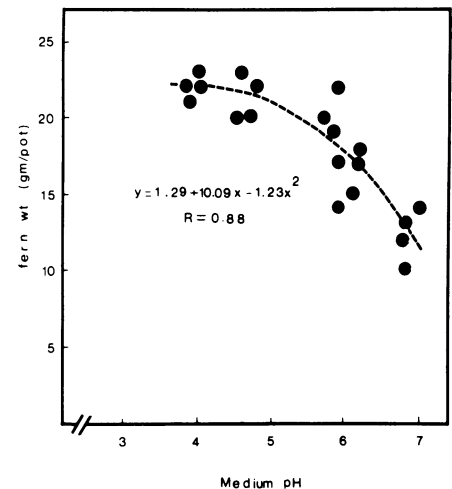


Fig. 1. Relationship between medium pH and top dry weight of fern plants.

shown in Fig. 1 are an average of values obtained on individual pots on July 26, September 21, and November 15. Application of the prediction equation indicates that growth reduction of about 25 and 50% would be expected from media with pH's of 6.2 and 7.0, respectively.

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