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RABBITEYE BLUEBERRY PLANT RESPONSE TO NITROGEN AND PHOSPHORUS

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Background. Acid, sandy soils selected for blueberry production are usually deficient in plant available phosphorus (P). Fertilizer addition at planting has not been a recommended practice. This glasshouse research was designed to study response of transplanted rabbiteye blueberry plants to fertilizer P and N rates.

Research Findings. Preplant phosphate was incorporated into 9.7 lb of 1:1 v/v loamy sand:peat mixture in a 2-gallon container at rates of 0, 41, 82, 123 and 164 lb P₂O₅/ac. Nitrogen was split-applied post-plant four times at 60-day intervals beginning 30 days after blueberry bushes were transplanted. Total N rates were equivalent to 0, 100, 200, or 300 lb/ac. Batches of 194 lb of the sand-peat mixture were treated with 37.8 gm of a fertilizer blend that contained 16% K₂O, 9.4% Ca, 8% Mg, 8% S, 1% Zn, 1% Fe, 0.2% Cu, 0.03% B, and 0.01% Mo. Plants were harvested and separated into leaf, stem, and root components 270 days after transplanting.

Total plant growth increased as N rate increased (Table 1). Leaf and stem weight increases contributed to this linear response while root weight was not affected by fertilizer N.

Table 1. Response of 'Tifblue' rabbiteye blueberry plants to fertilizer nitrogen and phosphorus.

Nitrogen rate lb/ac	Leaf D.M. ^y	Stem D.M.	Root D.M.	Total Plant D.M.	Number Stems >2 mm
0	10.2	20.5	26.5	57.2	3.0
100	14.0	23.4	30.1	67.2	3.8
200	17.0	26.2	25.1	69.7	5.1
300	21.4	30.7	30.3	82.4	4.8
Linear	*** ^z	***	N.S.	***	***
Quadratic	N.S.	N.S.	N.S.	N.S.	N.S.
-----grams/pot-----					
<u>P₂O₅ rate</u>					
lb/ac					
0	13.2	23.3	27.2	63.7	3.3
41	11.2	20.3	23.9	55.4	3.2
82	10.3	19.6	19.1	48.5	3.4
123	23.0	32.3	38.5	95.7	6.3
164	20.6	30.5	31.2	82.4	4.7
Linear	***	***	**	***	***
Quadratic	***	**	N.S.	*	N.S.

^yDry Matter

^z***, **, and * indicate statistically significant linear or quadratic responses at p=0.01, 0.05, and 0.10, respectively, due to treatment.

Phosphorus at the 123 and 164 lb/ac rates increased total plant growth. Phosphorus applications increased leaf P levels, but did not increase soil test P (data not shown).

The greatest yield response to the N and P interaction occurred with plant top growth (Fig. 1). Except

for the high N rate at the zero P treatment, N had no effect on plant growth at the 0, 41, and 82 lb P₂O₅/acre application rates. There was a significant ($p = 0.01$) linear response to N at P₂O₅ rates of 123 and 164 lb/ac. The optimum P₂O₅ rate for fertilization of the soil:peat mixture in the planting hole under conditions of this experiment was the equivalent of 123 lb/acre.

Application. Results from this research indicated that a rate of P₂O₅ equivalent to 123 lb/ac was needed to increase rabbiteye blueberry plant growth when the soil pH is between 5.0 and 5.5. This rate equates to 5.1 gm 0-46-0 per 50 lb soil:peat mix (45 lb soil:5 lb peat). This amounts to approximately 0.2 oz (1 slightly rounded teaspoon) 0-46-0 added to 45 lb soil:5 lb peat, equivalent to three-fourths bushel to be placed into the planting hole. At pH below 5.0, increased levels of extractable Al occur in this potting medium and a higher rate of P may be needed for best plant growth.

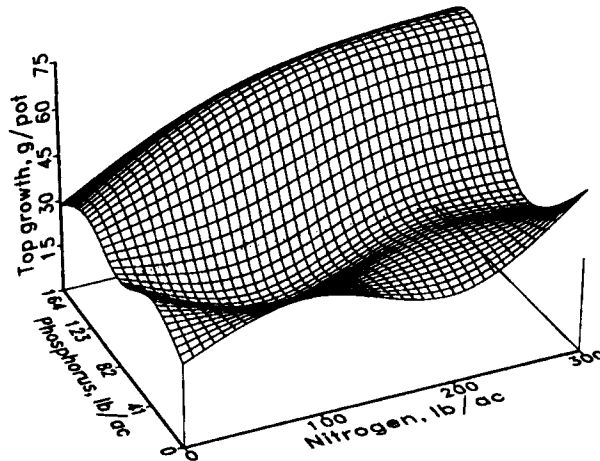


FIGURE 1. Rabbiteye Blueberry Plant Response to the Interactions of Nitrogen and Phosphorus