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Effect of Nitrogen and Phosphorus on Vegetative Growth

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ABSTRACT: The role of nitrogen, phosphorus and potash on vegetative growth, flowering, sex expression, fruit yield and quality in cucurbits has been reported by several vegetable scientists but the studies in relation to these factors in sponge gourd is very limited. Therefore, some of the recent critical reviews of literature in relation to response of nitrogen and phosphorus in different cucurbitaceous crops are given below. Vegetative growth and development are interrelated and integrated phenomena in plants, Vegetative growth refers to the quantitative changes in plant body while development refers to the qualitative changes such as flowering and fruiting. Flowering is most important phase of development because fruiting and consequently yield depends on this process. Flowers are unisexual in most of cucurbits. Expression of sex in flowers is genetically determined in these plants, but it is amenable to modifications by environmental factors, application of growth substances and plant nutrients. Nitrogen plays an important role in increasing fruit production. An adequate supply of nitrogen is essential for high yields of good quality.

KEYWORDS: Nitrogen, phosphorus, vegetative growth, plants, flowering, yield

INTRODUCTION

Improvement in length of the main vine and increase in a number of branches with seed soaking in nitrogen solution in bottle gour. however, the high concentration of nitrogen slightly stimulated vegetative growth of cucumber plant recorded best vegetative growth with the wider spacing and N, P and K fertilizer application in cucumber, the best and worst growth in the solutions containing NO 150 ppm and NH N@ 150 ppm, respectively. Furtherimprovement in main vine length, number and length of intemode with increasing N supply.

In ridge gourd,improved vine growth with nitrogen application in sandy loam soil. Similar results of improved plant growth characteristics in ridge gourd,) however, the plant growth was best at pH 6,5 when N, P, K and calcium were used in Luffa aegyptiaca. It was observed significant reduction in plant growth at low nutrient levels than at high levels. The lack of any of the 4 nutrient elements limited growth but N and P appeared to be the major elements limiting growth.

In muskmelon, the application of 100 kg N/ha+ 60 kg P/ha and 60 kg K,0/ha increased the length of main vine, number of leaves and secondary branches per plant, Similar results were reported in muskmelon, Phosphorus application improved plant growth characteristics when plants were grown in pretransplant nutritional conditioning (PNC) regimes in muskmelon, maximum growth of muskmelon plants with 150 mg N/1 when applied through trickle irrigation, Similarly maximum improvement in growth characters with the application of 96.9 kg N/ha but the most economical level was 45.38 kg N/ha for muskmelon while phosphorus had no appreciable effect, were of the opinion that

foliar of N, P, K fertilization in muskmelon and other cucurbits enhanced the growth of leaves and stems and increased the number of 1eaves.

N, P and K application markedly increased the plant growth in squash (Cucurbita maxima).In watermelon cv Sugar Baby reported that plants showed maximum growth with NO3-, least with H4-N and intermediate with the NH4 to NO 3 shift treatment 40 to 80 kg/N/ha maximum plant growth with 40 to 80 kg N/ha, in watermelon cv HW-1.The growth rate was 3 cm/day in first week and 4 cm day/ in 2nd week with nitrogen application in watermelon. the nitrogen deficiency in soil caused stunted plant growth and hastened aging of the plants,N deficiency in the soil reduced the early growth and stand of watermelon plants whereas plant growth was improved by broadcasting N, P and K fertilizer mixture before sowing of watermelon. Phosphorus application improved plant growth in watermelon.

MATERIALS AND METHODS

The field selected for the study was uniform in fertility level s having sandy loam soil. The soil sample were taken at random throughout the experimental field before layout of the experiment. The soil sample were analysed for their physical and chemical composition and is given below.

Month	Temp(oC) Maxi-mum	Mini-mum	Relative humidity	Sunshine hours	Evapora-tion(mm)	Rain-fall (mm)
March	31.7	11.8	58	8.9	5.1	6.6
April	31.6	15.7	65	8.6	4.7	5.3
May	41.9	23.6	36	9.0	12.0	0
June	39.9	27.1	47	5.8	11.6	77.0
July	35.1	26.1	70	5.1	7.2	132.6
August	34.9	25.9	69	7.6	6.5	204.9
September	35.4	23.0	66	9.2	6.8	10.7
October	31.6	15.7	65	8.6	4.7	5.3

Parameters	Summer season (1985)	Rainy season (1985)
Texture	Sandy loam	Sandy loam
pH	8.20	8.45
EC (mmhos/cm)	0.36	0.34
Organic carbon (%)	0.38	0.39
Available P_2O_5(kg/ha)	10.50	11.00
Available K_2O(kg/ha)	375	360

A. CLIMATE AND METEOROLOGICAL REPORTS :

The details of meteorological data of both the season is given below.

B. CROPPING HISTORY

The previous cropping history of the field was under:

Duration	Crop
1. July, 1983-February, 1984	Cucurbitaceous crops (Tinda and Bottle gourd)
2. March, 1984-June, 1984	Tomato
3. July, 1984-November, 1984	Cauliflower (Early)
4. November, 1984-February, 1985	Cauliflower(Snow Ball-16)

C. DETAILS OF EXPERIMENT

The field was manured at the rate of 20 cart loads of well-motten farmyard manure per hectare and was well leveled and pulverized. One pre-sowing irrigation was applied to field and later at proper moisture condition, two ploughings were done to have the field well prepared followed by planking to make it suitable for sowing. As per layout, the field was divided into smaller units having raised beds of size 5.0m x 2.5m. Each treatment was allotted a net plot size of 5.0m x 4.0m, i.e. 16 plants per treatment with a plant spacing of 60 cm. The experiment comprising of 4 nitrogen levels (0,25 kg/ha, 50 kg/ha and 75 kg/ha) and three phosphorus levels (0,20 kg/ha and 40 kg/ha) with a total of 12 treatment combinations was laid out in a randomized.

a)Nitrogen levels

1. N0 (N0 nitrogen application)

2. N25(25 kg nitrogen/hectare**)**
3. N50 (50 kg nitrogen/hectare)
4. N75(75 kg nitrogen/hectare)

b) Phosphorus levels

1. P0 (N0 phosphorus application)
2. P20 (20 kg phosphorus/hectare)
3. P40(40 kg phosphorus/hectare)

The treatment combinations were:

1. N0P0	7. N50P0
2. NOP20	8. N50O20
3. NOP40	9. N50P40
4. N25P0	10. N75P0
5. N25P20	11. N75P20
6. N25P40	12. N75P40

The crop was sprayed two times against red pumpkin beetle and three times against powdery mildew and mosaic during the course of study in both seasons.

CONCLUSION

The growth and yield of a crop is greatly influenced by the environment prevailing during the period of Vegetative and reproductive growth stages, The environment consists of atmospheric and soil conditions and when these conditions are at the optimum level, the genetic yield potential of a emp can easily be exploited. Under a given atmosphere and soil environment, soil fertility is the most important factor affecting the growth, yield and quality of the crop and balanced nutrition is essential for creating optimum conditions for crop growth, The present investigations were carried out to find out the effect of application of nitrogen and phosphorus on growth, flowering, sex expression, fruit set, earliness, field and quality of sponge gourd.

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