



Nutrients Requirement of Ashgourd (*Benincasa bispida* cogn.) Under Degraded Soils of Alluvial Region of Uttar Pradesh

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Abstract

The field experiment was carried out during rainy season of 2009-10 and 2010-11 in the catchments area of left bank of Yamuna River. The study was made under "Farmers Participatory Action Research Programme on Water/Rain Water Harvesting (Scheme of Ministry of Water Resources, New Delhi)" for carrying out the research programme on important technologies of water harvesting. The soil of experimental area was light loam with low plant nutrients status. The four treatment i.e., 20 kg N + 20 kg P₂O₅ + 40 kg K₂O/ha, 40 kg N + 30 kg P₂O₅ + 60 kg K₂O/ha, 60 kg N + 40 kg P₂O₅ + 80 kg K₂O/ha and 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha were tested. The improved cv. *Kashi Dhawal* was planted between 10-15 July after rainfall during both experiment years and harvested after 110-115 days after planting. Application of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha yielded single fruit by 5.65 kg, followed by 60 kg N + 40 kg P₂O₅ + 80 kg K₂O/ha (5.20 kg weight/fruit). The lowest single fruit weight was noted under 20 kg N + 20 kg P₂O₅ + 40 kg K₂O/ha as 3.80 kg/fruit. The applied dose of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha registered highest fruits yield by 603.00 q/ha, followed by 60 kg N + 40 kg P₂O₅ + 80 kg K₂O/ha (566.00 q/ha). The lowest yield was recorded at 20 kg N + 20 kg P₂O₅ + 40 kg K₂O/ha by 350.00 q/ha. Fruits store up to six month with the waxination of stem end with wax under open environment without any natural hazards.

Keywords: Degraded soil, Farmers participatory, *Kashi Dhawal*, Stem end, Wax.

Introduction

The ashgourd is also called by different names i.e., white gourd, petha, wax gourd, Chinese preserving melon, Kumhra etc. at different places. It is grown all over northern India for its fleshy fruits. The immature fruits are cooked as vegetable but when ripe it is used for sweet meat known as petha, sweat candy, petha mash cake. It is rich in vitamin A and is also a good source of vitamins B and C. "Agra Ka Petha" which is famous throughout India, is prepared from it. So there is a good market of ashgourd at Agra and other places in north India. It is said to be good for patients of weak nervous system. Ashgourd contains moisture 96.5 gm, protein 0.4 gm, carbohydrates 2.9 gm, mineral matter 0.3 mg, calcium 30 mg,

iron 0.8 mg, phosphorus 20 mg, calories 10, fat 0.1 gm, riboflavin 0.1 mg, vitamin c 1 mg, thiamine 0.06 mg nicotinic acid 0.4 mg per 100 gm of edible portion.

As it is known that degraded soils are very poor in plant nutrients specially in erosion dominated area but majority of farmers cultivate the ash guard on large scale in this area. They are not use proper dose of manure and fertilizers. The feedback received from the farmers fields that they are use FYM/compost @100 q/ha at the time of field preparation and 25 kg/ha urea is applied at the time of vining and 25 kg/ha urea at the time of initial fruits set. Therefore, a flexible

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DOI: <http://dx.doi.org/10.21746/aps.2022.11.11.5>

plan was prepared to study the effect of different doses of NPK on fruit yield of ashgourd is the subject matter of this manuscript.

Materials and Methods

The field experiment was carried out during rainy season of 2009-10 and 2010-11 in the catchments area of Yamuna river. The study was made under Farmers Participatory Action Research Programme on Water/Rain Water Harvesting (Scheme of Ministry of Water Resources, New Delhi) for carrying out the research programme on important technologies of water harvesting. The pilot site soil was light loam, having pH 8.2, organic carbon 0.30%, total nitrogen 0.03%, available P_2O_5 8.62 kg/ha and available K_2O 191 kg/ha. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by calorimetric method (Datta et al., 1962). Total nitrogen was analyzed by Kjeldahl's

method as discussed by Piper (1950). The available P_2O_5 and K_2O were determined by Olsen's method (Olsen et al., 1954) and Flame photometric method (Singh, 1971), respectively. The experimental site was located 15 km away from the left bank of Yamuna river. The four treatments i.e, 20 kg N + 20 kg P_2O_5 + 40 kg K_2O /ha, 40 kg N + 30 kg P_2O_5 + 60 kg K_2O /ha, 60 kg N + 40 kg P_2O_5 + 80 kg K_2O /ha and 60 kg N + 40 kg P_2O_5 + 80 kg K_2O + 250 q FYM/ha were tested. The seven kg seed/ha of cv. *Kashi Dhawal* was used and planting distance maintained 150 cm row to row and 60 cm hill to hill. Seeding depth was maintained 2 cm. The sowing was done between 10 to 15 July after rainfall during both experimental years and harvested after 110 to 115 days after planting. The crop was irrigated as and when required. The conservation agronomical practices were followed for raising of the crop.



Waxinated fruit for storage study Officer of Central Govt. and Scientists of University observing the fruits.

Results and Discussion

The pooled data of two year are presented in Table-1 and discussed here under appropriate heads.

Table 1: Single fruit weight, yield and storage capacity of ashgourd
(Pooled data of two years)

Sl. No.	Treatment	Single fruit weight (kg)	Yield (q/ha)	Increase in yield (q/ha)	Storage capacity in month under open environment.
1.	20 kg N + 20 kg P_2O_5 + 40 kg K_2O /ha	3.80	350.00	-	6 month
2.	40 kg N + 30 kg P_2O_5 + 60 kg K_2O /ha	4.30	490.00	140.00	6 month
3.	60 kg N + 40 kg P_2O_5 + 80 kg K_2O /ha	5.20	566.00	216.00	6 month

4.	60 kg N + 40 kg P ₂ O ₅ + 80 kg K ₂ O + 250 q FYM/ha	5.65	603.00	253.00	6 month
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Single fruit weight and yield (q/ha): Perusal of data given in Table -1 make it clear that increasing levels of N.P.K. increased the single fruit weight. The weighty fruit of ash guard was found under the treatment of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha by 5.65 kg/fruit, closely followed by the application of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O/ha (5.20 kg/fruit). The lowest single fruit weight was weighed under the treatment of 20 kg N + 20 kg P₂O₅ + 40 kg K₂O/ha as 3.80 kg. The application of higher and lower doses of plant nutrients in term of NPK were responsible for highest and lowest single fruit weight of ashgourd. Application of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha registered highest yield of ash gourd by 603 q/ha, closely followed by used of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O/ha (566 q/ha). The applied dose of 20 kg N + 20 kg P₂O₅ + 40 kg K₂O/ha produced lowest fruits yield of ashgourd as 350 q/ha. Application higher doses of N, P & K in association of FYM gave higher fruits yield of ashgourd due to better availability of NPK and macro and miner plants nutrients from FYM were responsible for higher fruits productivity. The poor availability of plant nutrients from lower dose of NPK, supported to the lowest fruits yield of ashgourd. Sharma and Shukla (1972) reported

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similar results in the production of fruits yield of pumpkin. Sharma and Shukla (1972) further indicated that the higher doses of nitrogen and phosphorus application increased the productivity of muskmelon fruits.

Storage study of ashgourd fruits: Since, the sweet candy or petha preparation is a longtime process and total fruits production cannot be utilized at one time. Thus, the fruits storage study was carried out at field condition in open environment under trees shade. It has been found that the variable doses of NPK did not affect to the fruits of ashgourd up to six month from any natural hazards during spring/summer seasons under open environment with the waxination of stem ends.

Conclusion and Recommendation

The ashgourd fruits production gave higher yield at the application of 60 kg N + 40 kg P₂O₅ + 80 kg K₂O + 250 q FYM/ha and store up to six month in open environment under trees shade with waxination of the stem end. Therefore, the ashgourd growers may be suggested for this technique and harvest the fruits of newly generated technology

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Source of support: Nil;

Conflict of interest: The authors declare no conflict of interests.

Cite this article as:

Singh, R.A., Amar, S., Dharmendra, Y., R.K. Singh and I.P. Singh "Nutrients Requirement of Ashgourd (*Benincasa bispida* cogn.) Under Degraded Soils of Alluvial Region of Uttar Pradesh." *Annals of Plant Sciences*.11.11 (2022): pp. 5508-5511.

DOI: <http://dx.doi.org/10.21746/aps.2022.11.11.5>