

Growth and yield of ber as affected by nitrogen and phosphorus levels in arid condition of Rajasthan

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Abstract: A field experiment was conducted during 2004-05 and 2005-06 to study the growth and yield of ber under three levels of nitrogen (250, 500 and 750g N per tree) and phosphorus (200, 350 and 500g P_2O_5 per tree). The application of nitrogen and phosphorus significantly influenced the vegetative growth and fruit yield of ber. The highest fruit yield (40.19 kg/tree) was recorded with the application of 500 g per tree per year each of nitrogen and phosphorus. The higher values of colour, texture and diameter of fruits were also obtained with application of N and P_2O_5 at 500 g per plant per year.

Key words: Ber, growth parameters, nitrogen, phosphorus, yield.

Introduction

Ber (*Ziziphus mauritiana* Lamk) is one of the nutritious fruits of arid and semi-arid region. India is a leading producer of ber with an area of about 87,700 hectares and a production of 8,94,900 tonnes (Dhandar and Saroj, 2004). It is commercially grown in the states of Rajasthan, Gujarat, Haryana, Punjab, Uttar Pradesh, Bihar, Maharashtra and Andhra Pradesh. It is also becoming a commercially important fruit crop in many other arid and semi-arid parts of India due to its hardy nature, profuse bearing and better adaptability to diverse soil and climatic conditions. It can give higher income on marginal lands where most other fruit plants do not survive. Due to its comparative advantage, the area and production of ber is increasing at faster rate in arid and semi-arid regions. Judicious nutrient management is important for obtaining lucrative income from ber which is grown over a number of years. Nitrogen and phosphorus are major primary nutrients which determine quantity and quality of fruits and these elements are poorly available in saline soils. Location specific recommendations are not available in respect to nitrogen and phosphorus. Hence, present investigation was undertaken to find out the effect of different doses of nitrogen and phosphorus on growth and yield parameters of ber.

Material and Methods

A field investigation was carried out at Central arid zone Research Institute, Krishi Vigyan Kendra Pali farm, during 2004-05 and 2005-06 on 15 year old ber trees

cv. Gola. The soil of the experimental site was sandy loam with 135.98, 18.22 and 295.36 kg/ha N, P and K availability respectively. The treatments consisted of three levels each of nitrogen i.e., 250g (N_1), 500g (N_2) and 750g (N_3) per tree and phosphorous i.e., 200g (P_1), 350g (P_2) and 500g (P_3) per tree with one control (no fertilizer). The experiment was laid out in factorial RBD with three replications. Half dose of nitrogen and full dose of phosphorus was applied in July and the remaining quantity of nitrogen was applied after fruit set in the month of November. As the soil was quite rich in availability of potash (295.36 kg/ha), it was not applied.

All the regular cultural operations were adopted in the orchard. Observations were recorded on shoot length, shoot girth, leaf area, number of leaves per shoot; per cent fruit set and fruit retention per cent from randomly selected four shoots of four sides of the tree. The fruits were harvested at colour turning stage in five pickings and the yield was recorded accordingly. The shoot length was taken by measuring tape, while shoot girth, fruit length and diameter were measured with the help of vernier calipers. The leaf area was measured with the help of graph paper. The fruits colour and texture was adjudged by a panel of judges by allotting score on 10 point hedonic scale.

Results and Discussion

Application of nitrogen significantly influenced the shoot length, shoot girth, number of leaves per shoot and leaf area of ber trees (Table 1). The highest shoot