

Effect of micronutrients and plant growth regulators on fruiting of litchi

MANOJ KUMAR, RAJESH KUMAR* AND R.P. SINGH

Department of Horticulture (Fruit and Fruit Technology), Bihar Agricultural College, Sabour, BHAGALPUR (BIHAR) INDIA

ABSTRACT

The present investigation was conducted in the litchi orchard of the Horticulture Garden of Bihar Agricultural College, Sabour in the year 2006 to assess the effect of micronutrients and plant growth regulators on fruiting in litchi cv. PURBI. The application of borax 0.4 per cent resulted in maximum fruit set (42.50 per cent), fruit retention (22.60 per cent), size of fruit (3.72 cm x 2.90 cm), number of fruit per tree (5422), weight of individual fruit (20.91 gm) and fruit yield per tree (111.05 Kg). GA_3 20 ppm also was found effective treatment to increase fruit set, fruit retention and size of fruit being maximum of 42.18 per cent, 21.81 per cent and 3.64 cm x 2.84 cm, respectively. GA_3 20 ppm produced maximum number of fruits/tree (5327), weight of individual fruit (20.66gm) and fruit yield per tree (104.55 Kg). Interaction between borax 0.4 per cent and GA_3 20 ppm exhibited in maximum retention of fruit (24.64 per cent) and fruit yield of 123.10 Kg/tree. Aril percentage was high in borax 0.2 per cent and 2,4-D 10 ppm. Minimum fruit crack of 10.91 per cent was observed in borax 0.4 per cent.

Key words : Litchi, Micronutrient, Plant growth regulator, Yield, GA_3 , Borax

INTRODUCTION

Indian agriculture as such in its present era is shedding off its traditional costumes acquiring a format which is expected to form the back bone of Indian economy. Once referred to as a begging bowl, Indian agriculture today is bubbling with rejuvenated vigour excelling in all walk of economic front. It has not only gained self sufficiency in food production, but today it is strengthening Indian economy through export of various agricultural products. Horticultural products in general and fruits in particular are premier commodities of export. Amongst fruit crops, litchi (*Litchi chinensis* Sonn.) occupies prime place of importance. So far as export of agricultural products is concerned, by virtue of its delicious taste, excellent flavour, pleasant fragrance, attractive appearance and high nutritional values, it has gained popularity in many parts of the world opening up new vistas for accelerated export opportunity. However, to stay in global market, which is turning more and more competitive day by day, it is of paramount importance to maintain high standard in the qualities of fruits produced, besides imparting fascinating appearance to them and providing longer shelf life. From economic point of view, it is equally important to get a good harvest, besides having improvement in quality aspect.

Zinc plays a vital role in the metabolic activities of plants. The principal functions of zinc in plant is as a metal activator of enzymes like dehydrogenase (pyridine nucleotide, glucose-6 phosphodiesterase, carbonic anhydrase etc.). It is involved in the synthesis of tryptophane, a precursor of IAA. It is associated with water uptake and water retention in plant bodies (Noggle

and Fritz, 1989). Boron, on the other hand, is considered to be necessary for hormone metabolism, photosynthetic activities, cellular differentiation and water absorption in plant parts. It is also involved in reproduction, germination of pollen tube and fertilization. In case of boron deficiency, flowers are produced in less number and are mostly sterile, fruits are deformed and renders themselves commercially useless (Yawalkar *et al.*, 1992).

The effect of micronutrients in augmenting litchi yield and quality is a foregone conclusion, but the beneficial effect of micronutrients in combination with plant growth substances was yet to be fully explored especially in the Indo-Gangetic plains of Bihar to which litchi tracts of Bihar belongs. This paves the path for the current experimentation.

MATERIALS AND METHODS

The experiment was conducted in the litchi orchard of the Horticulture Garden of the Bihar Agricultural College, Sabour in the year 2006. Two micronutrients ($ZnSO_4$ and borax) and two plant growth regulators (2,4-D and GA_3) each at their two lower and higher levels *i.e.* $ZnSO_4$ at 0.4 per cent (M_1) and 0.8 per cent (M_2); Borax at 0.2 per cent (M_3) and 0.4 per cent (M_4) and 2,4-D at 10 ppm (P_1) and 20 ppm (P_2) and GA_3 also at 10 (P_3) and 20 (P_4) ppm sprays were tested in Randomized Block Design (Factorial) replicated thrice. One control plot was also there in each replication for making effective comparison. Micronutrients were sprayed on new growth flushes before initiation of inflorescence, whereas, PGRs were sprayed after completion of fruit setting. The litchi variety used for experimentation was "Purbi". The litchi