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Title: EFFECT OF ZINC, BORON, CALCIUM AND GA 3 ON GROWTH, YIELD AND QUALITY OF STRAWBERRY (*Fragaria ananassa* Duch.) cv. DOUGLAS

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Abstract: The strawberry (*Fragaria ananassa* Duch.) is one of the most important soft and delicious fruits of the world. It is a native of temperate regions, but it has adapted well to different climates viz. moderate, Mediterranean, subtropical even at high altitudes of tropical climate. Botanically it is an aggregate fruit, widely appreciated for its characteristic aroma, bright red colour, juicy texture, and sweetness. It is consumed in large quantities, either fresh or in prepared forms such as preserves, fruit juice, ice-creams and milk-shakes. The fresh strawberry fruits are rich source of vitamins and minerals. Strawberry contains about 0.55% pectin (as calcium pectate). It is fairly good source of Vitamin-A (60 IU/100 g of edible portion) and Vitamin-C (30-120 mg/100 g of edible portion). The mature soft fruit contains about 5.0% total sugar and 0.50%-1.85% acidity. The crop is gaining popularity in the plateau region of Jharkhand, especially in Ranchi, due to congenial climatic conditions, but there is lack of information regarding its cultivation, application of secondary & micro-nutrients and plant growth regulators especially gibberellic acid. The experiment was conducted during 2012-13 at experimental unit of the Ranchi Agriculture College, B.A.U., Ranchi with seventeen treatments of different concentration of zinc sulphate (0.2 & 0.4 %), borax (0.1 & 0.2 %) and calcium nitrate (0.5 & 1.0 %) alone, combined and their combination with GA3 (100 ppm) with water spray as control. Treatments were replicated thrice in randomized block design. First application was applied at sixty days after transplanting and thereafter three times at fifteen days intervals. Result revealed that different concentration of zinc, boron, calcium and GA3 application significantly affected the plant growth, yield and quality as well as shelf life of fruits. Maximum plant height (28.46 cm), East-West spread (36.44 cm) & North-South spread (33.35 cm), no. of leaves (32.27), leaf area (28.40 cm²) and no. of runners per plant (15.47) were recorded with zinc sulphate (0.4%) + borax (0.2%) + calcium nitrate (1.0%) + GA3 (100 ppm) application. The minimum days taken to first flowering (72.60 days), first fruit set (4.13 days), colour development (2.13 days) and maturity of fruits (22.47 days) were also found with the application of zinc sulphate (0.4%) + borax (0.2%) + calcium nitrate (1.0%) + (GA3) (100 ppm) combination. Quality and yield attributing characters viz. the maximum no. of flowers (28.93), no. of fruits (22.40) per plant and maximum fruit length (4.28 cm), breadth (2.88 cm), volume (10.12 cc), average fruit weight (10.47g), juice (75.20%), TSS (13.33° Brix), acidity (1.108%), total sugar (8.62%), reducing sugar (6.69%), ascorbic acid (67.65 mg/ 100g fruit) content and maximum shelf life of fruits under ambient condition (3 days) were observed with the same treatment combination of zinc sulphate (0.4%) + borax (0.2%) + calcium nitrate (1.0%) + GA3 (100 ppm). Due to better vegetative parameters and yield attributing features, the maximum yield (116.34q/ha) was obtained with treatment zinc sulphate (0.4%) + borax (0.2%) + calcium nitrate (1.0%) + GA3 (100 ppm) which produced maximum net profit (Rs. 6,07,224/ ha) and the benefit cost ratio was 2.09 as per the recorded observations. So it can be inferred that significant increase in growth, yield and quality as well as shelf life of strawberry cv. Douglas could be obtained by the application of Zinc Sulphate (0.4%) + Borax (0.2%) + Calcium Nitrate (1.0%) + GA3 (100 ppm).

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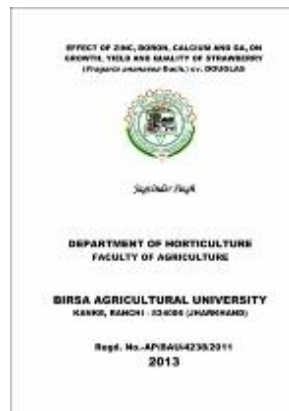
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