



The Effect of Micro Nutrients Supplementation on Enhancing Strawberry Fruit Yield and Quality (*Fragaria × ananassa*)

(*Netinti Harika, Samir E. Topno, Saket Mishra and Rakesh Kumar)

Sam Higginbottom University of Agriculture Technology & Sciences, Naini, Prayagraj

*Corresponding Author's email: nvnpeta@gmail.com

Abstract

The quality of strawberry fruits improved through the proportion of nutrients N, K and, Ca, as they affect the fruit firmness, sugar content, and acidity. A study was conducted to find out the effect of these elements on Strawberry (*Fragaria × ananassa* Duch.) var festival fruits quality, the treatments, included, Control(0), (CaCl₂ 300mg.L⁻¹), (K₂SO₄ 1000mg.L⁻¹), (Amino acids 1ml.L⁻¹), (300 mg.L⁻¹ CaCl₂ + 1000 mg.L⁻¹ K₂SO₄), (Amino acids + 1ml.L⁻¹), (Amino acids + K 1ml.L⁻¹) and (1ml.L⁻¹ Amino acids + 300mg CaCl₂ + 1000mg K₂SO₄) were applied as foliar application, every 15- day intervals for four times through the growing season. Plant production increased significantly when the plant was treated with amino acids + potassium, while the fruits with calcium chloride were the most firmness. The fruits of plants treated with (1ml.L⁻¹ Amino acids + 300mg CaCl₂ + 1000mg K₂SO₄) were distinguished by their weight, size, the high percentage of TSS as an indicator of sugars, as well as their low acidity, also, the accumulation of K and Ca increased in the fruits of this treatment, which may explain the improvement in their quality

Keywords: strawberry, calcium chelate, carbonic powder, zinc

Introduction

STRAWBERRY is an attractive, luscious tasty and nutritious fruit with a distinct and pleasant aroma, and delicate flavour. It has a unique place among cultivated berry fruit. It is a man-made hybrid. Some important points related to strawberry are as follows. Monoecious, short day, low perennial herb and quick growing plant. Suitable for kitchen garden. Rich in vit.-c and iron. Flavour is due to Ethyle butanoate and Ethyle. First fruit crop. micro-propagation studied. hexanoate. Flowers are borne in small cluster and white in colour. Type of inflorescence: Dichotomic raceme. Type of fruit: Etacrio of achenes of pollination: both self and cross. Type Major pollinator: Honey bee. Edible portion: Succulent thalamus. Chromosome no. (2n)=56 (8x), The United States is the world's leading producer of strawberries producing over 36 billion pounds in 2012 and accounting for 29% of the total world production. Among the fruits consumed in the United States, strawberries ranks fifth in consumption behind bananas, apples, oranges, and grapes. In the United States, California accounts for the highest commercial production of this berry crop, followed by Florida and Oregon. California's 12-month growing season contributes to higher strawberry yields per acre than any other growing region.

Micronutrients being involved in virtually all metabolic and cellular functions taking place within the plant play an important role in improving quality and sustain production of strawberry (Hansch et al., 2009) and their deficiencies often limit crop productivity and

quality. Keeping in view the present investigation was planned to standardize the dosage of micronutrients to overcome the problem of low yield and quality of strawberry fruits.

Effects of micro nutrients

Micronutrients are vital to the growth of plants, acting as catalyst in promoting various organic Reactions taking place within the plant and their deficiencies often limit crop productivity in Fruit crops. Application of zinc sulphate and ferrous sulphate are increased the fruit yield, Acidity, TSS content, higher concentration of zinc sulphate resulted in enhanced shelf life of Fruits at ambient temperature and higher concentration of ferrous sulphate had toxic effect on The plant and retarded the growth, yield and quality attributes. In the past, there was no need of Micronutrients because these trace elements were naturally supplied by soil. But due to Intensive cultivation, increase in salinity and soil pH in most of soils, these nutrients are Present but are not available to plants . Zinc and Boron have important Role on pollination, fruit set and yield Among the Micronutrients. Boron plays important role in pollen tube growth which effect seed and fruit Set and increase shelf life , Zinc plays an important role by Increasing sugar and decreasing acidity Foliar application of zinc sulphate Increased size, TSS, and juice of orange Foliar application of Boron increased yield and fruit quality of grape.

Economic importance of winter varitey of strawberry

The “Winter Dawn” variety of strawberry is known for its economic importance due to several factors:

Extended Growing Season: Winter Dawn strawberries can be harvested earlier in the season and continue producing fruit through the winter. This extended growing season allows growers to fetch higher prices for strawberries that are not as readily available during the colder months.

Higher Market Value: Because Winter Dawn strawberries are available when other varieties are not, they often command a premium price in the market. This can be financially advantageous for farmers.

Diverse Growing Regions: This variety can be grown in various regions with milder winters, expanding the geographical areas where strawberries can be cultivated. This diversification can reduce risks associated with weather and climate-related crop failures.

Consumer Demand: The availability of fresh strawberries during the winter months is met with high consumer demand. This demand drives market opportunities and can be economically beneficial to both producers and sellers.

Export Potential: Winter Dawn strawberries have the potential to be exported to regions where fresh strawberries are in demand during the winter season. Exporting can open up additional revenue streams for growers.

Product Differentiation: Winter Dawn strawberries offer a unique product that can help growers differentiate themselves in the market. This can lead to brand recognition and a loyal customer base.

Overall, the Winter Dawn variety of strawberry has economic significance for its ability to provide fresh strawberries during the winter months, command premium prices, and open up new market opportunities for growers and sellers.

Conclusion

Strawberry being a perennial herb, it can be grown by both seeds and by asexual propagation like runners commercially. Application of Calcium chelate have a positive impact on the growth, yield, and quality of strawberries. The foliar application of calcium fertilizers, iron, zinc, micro nutrient fertilizers increased the size and weight of strawberry fruits, as well as the total yield of the plants, this was due to the positive effect of calcium on the formation of

cell walls, which improved the strength of the fruits and reduced the incidence of cracking. The calcium chelate application increased the firmness of strawberry fruits, which is an important quality trait for consumers. Application of calcium chelate increased the number of flowers and the size of the leaves in strawberry plants. Silica, Magnesium, carbonates, calcium is a micro nutrient fertilizer that contains finely ground calcite enriched with several essential nutrients, including calcium, magnesium, and silicon. Applying a micronutrient fertilizer containing calcium, magnesium, and iron increased strawberry yield and improved fruit quality compared to a control group that did not receive the fertilizer. Increased yield and fruit quality may have been due to the improved nutrient balance and enhanced root development provided by the micronutrient fertilizer.

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