

A Review on Strawberry and Effect of PGR

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Strawberry is soft, luscious, nutritious, tasty, and perishable fruit which are grown in temperate climatic conditions where the plant behaves like a small perennial herb and also grown in a sub-tropical climate whose plant behaves as an annual belonging to the family Rosaceae (Salentijn et al., 2003; Srivastav et al., 2018). The cultivated strawberry (*Fragaria × ananassa Duch.*) is a monoecious octaploid hybrid of two largely dioecious, octaploid species, *Fragaria chiloensis Duch.* and *Fragaria virginiana Duch.* (Cv et al., 2016). Strawberry is a non-climacteric fruit and characterized by a high softening rate, short post-harvest life, and fast decay (Bustamante et al., 2009). It is propagated through the runners and is red in colour due to the presence of anthocyanin, pellarogonidin, 3-monoglucoside, and traces of cyanide (Srivastav et al., 2018). Consumption of strawberries leads to health benefits against cancer, aging, inflammation, and neurological diseases (Cv et al., 2016). Strawberry is delicious, nutritious, red fruit and its taste depend upon three compounds i.e. sugar (0.5%), acid (0.90–1.85%), and aromatic compounds (Bj et al., 2020). Strawberry's edible parts are receptacle, petioles, achenes or real fruit, and seed. It has short stems known as crown which produces leaves along the stem axis and flowers.



Botanical Description

Strawberry is slow growing herbaceous plant with a short perennial branch, crown and runners are produced in the axils of the leaves, which are normally trifoliate. The leaves are compound, typically with three leaflets, sawtooth-edged, and usually hairy. The strawberry features a fibrous rootage. This group arises from the thick, short stems that are on the brink of the soil surface. The roots extend horizontally for a distance of 30 cm from all directions below the soil surface. The fruits have various shapes, according to the cultivar: conical, conical-elongate, conical rounded, spheroidal, oblate, re-uniform (kidney shape).

Climate

Strawberry grows well under temperate climate. Some cultivars can be grown in sub-tropical climate. Daylight period of 12hrs. or less and moderate temperature are important for flower-bud formation. Each cultivar has a different day length and temperature requirement. The ideal temperature for strawberries is between 13 and 22 degrees Celsius. It is also possible to grow strawberries indoors all year around through to winterize strawberries, it will require extra setup.

Effect of PGR

Different plant growth regulators perform different function on strawberry. Various PGR like



Auxin, gibberellin and cytokinin are used in strawberry in order to increase the fruit size, enhance fruit set, growth, and yields. Among them, auxin are used for enlargement of receptacle, fruit size growth and delay fruit ripening, gibberellin inhibit the fruit ripening, abscisic acid develop a colour on fruit and nitric oxide extent the post-harvest life of ripe fruit. Auxins are also called as key phytohormones, applied in controlling the growth and ripening the fruit which is associated with increase in pectin and reduction of hemicelluloses content.

Plant heights, number of runners, number of flowers, fruit set percentage, number of fruits, fruit size, fruit weight, and fruit quality are all affected by gibberellic acid.

NAA is a synthetic auxin that is most commonly employed in the production of high-quality strawberries in terms of total sugars, ascorbic acid content, and titrable acidity percentage. NAA is a synthetic version of auxin that aids in cell elongation, division, vascular tissue differentiation, root initiation, apical dominance, leaf senescence, leaf and fruit abscission, fruit setting ratio, fruit dropping prevention, and flower sex ratio promotion. The physical and chemical features of the strawberry fruit are modified by the use of growth regulators. The use of plant growth regulators improves the quality of strawberry fruits, according to several studies. All doses of GA₃ improves strawberry vegetative development, but cycocel at 500 ppm, followed by NAA at 30 ppm, is the best in terms of strawberry output and quality.

Conclusion

Plant growth regulators are the tools in flowering, fruiting, and ripening. The use of PGRs is increasing day by day mainly in many agricultural fruit crops. Therefore, numbers of synthetic chemicals are used for the regulations of growth and development of cultivated plants. Moreover, these growth regulators can be utilized for sustainable and ecologically sound fruit production. In addition, promote the less use of chemical fertilizers to a great extent. The review focuses on the influence of PGRs on growth, yield, and fruit quality of fruit crops.

References

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