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Effect of Bio-Fertilizer in Strawberry Cultivation

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Strawberry is one of the most economically important berry fruits consumed for its nutrient content and pleasant flavor. Strawberry is a member of the Rosaceae family and one of the most popularly consumed berries in the world. It is commercially cultivated worldwide for its highly appreciated sweet, aromatic, and juicy fruit. 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. Turkey, Spain, Egypt, and Mexico are the other leading strawberry-producing countries. Most strawberries produced are consumed fresh.

The strawberry is a much appreciated fruit by virtue of its nutritional properties and alleged healthy effects, and its production has grown steadily over recent decades. However, its instability in seasonal markets, high perishability, and stringent quality criteria can lead to substantial surpluses with highly adverse impacts on social and economic conditions on production areas, and also on the environment by effect of such surpluses constituting highly polluting waste. At present, strawberry surpluses are being used to obtain purée for the production of various food ingredients and supplements. However, the chemical composition of strawberry purée (SP) is ideal for a number of biotransformations potentially providing new products with an increased added value and healthy properties. This chapter discusses the production of new beverages and condiments by mixing two essential ingredients obtained in parallel by biotransformation of SP. Thus purée can be used to obtain strawberry vinegar through alcoholic fermentation and subsequent acetification, as well as gluconic acid by selective bicoconversion of glucose while preserving the fructose content of the substrate. The result is an alcohol-free, scarcely diabetogenic sweet- and-sour product.

Botanical Description of Strawberry

The strawberry (Fragaria) (plural strawberries) is a genus of plants in the family Rosaceae and the fruit of these plants. There are more than 20 named species and many hybrids and cultivars. The most common strawberries grown commercially are cultivars of the Garden strawberry.

Origin

The cultivated large-fruited strawberry (Fragaria ×ananassa) originated in Europe in the 18th century. Most countries developed their own varieties during the 19th century, and those are often specially suitable for the climate, day length, altitude, or type of production required in a particular region.

Economic Significance

Strawberry farming is one of the most profitable farming businesses with average returns of up to 4 Lakh 75 Thousand (Rs. 475000) Per acre. The profit is far higher than most other crops.

Cultivation

The strawberry plant grows from a dense "crown" at the base of the soil. The leaves, fruit, runners and roots all grow from the crown. Strawberries are usually planted as dormant bare root crowns with just a couple of leaves and a small root system. Strawberry grown best in a temperate climate. It is a short day plant, which requires exposure to about 10 days of less than 8 hours of sunshine for the initiation of flowering.

Material and Method

Strawberry (Fragaria × ananassaDuch.) cv. Camarosa was used for the present study. The experimental plants were inoculated with three different biofertilizers, consisting eight different treatment combination viz.Control, 100% RDF(N:P:K @6:10:6 g/plant), 100% RDF + Azotobacter @ 2g/plant, 100% RDF + Azospirillum @ 2g/plant, 75% RDF + Azotobacter @ 2g/plant + topdressing of 25% each of P and K, 75% RDF + Azospirillum @ 2g/plant + topdressing of 25% each of P and K, 75% RDF + Azotobacter @ 2g/plant + PSB @2g/plant + topdressing of 25% K and 75% RDF + Azospirillum @ 2g/plant + PSB @2g/plant + topdressing of 25% K. All the plants were maintained under uniform cultural schedule during the entire course of investigation.

Preparation of working solution of biofertilizers

Bihar Azoto, Bihar Azospi and Bihar Phosphorous were used as the source of Azotobacter, Azospirillum and Phosphate Solubilising Bacteria (PSB) stains respectively. On the day of planting, working solution of Azotobacter, Azospirillum and PSB were prepared in the morning by dissolving 200 gm each biofertilizer powder in separate buckets containing 8 lit of water each.

Treatment to experimental plants

After preparation of working solution, the root system of experimental strawberry plants were dipped in to those solutions according to the treatment for about 30 min before planting them in to the main field. However, top dressing of phosphorous and potassic fertilizer was done to the plants on 15 days after planting (DAP) according to the treatment.

Post-Harvest Treatment

Post-harvest treatment is applied to fruit either to maintain quality or to improve visual appeal Wastage of fruits by microorganism between harvest and consumption can berapid and severe particularly in tropical areas were high temperature and high humidity favour rapid microbial growth. Post-harvest wastage of fruits maybe reduced by low and high temperatures, modified atmospheres, correct humidity, irradiations and good sanitation.

Post-Harvest Storage

Strawberries must be cooled immediately after harvest by forced-air cooling to a temperature of 40°F or lower. Hydrocooling (flooding them with chilled water) is not recommended because wet berries are much more susceptible to decay. Cooling with crushed or "liquid" ice is even worse because the berries are likely to sustain physical damage.

The most common carton for strawberries is an open-top, single-layer tray containing 8 1-quart or 12 1-pint containers. Trays are stacked in layers of six to form a pallet load of 60 or 84 trays, respectively, weighing approximately 1,000 pounds. The cartons have enough

open area to allow for passage of cooling air. To prevent severe bruising and a reduction in quality and appearance, care must be taken not to overfill the trays.
At a storage room temperature of 32°F, the relative humidity should be from 90 to 95 percent.

Post Harvest Physiology and Disorders

The most common decay is grey mould, caused by Botrytis cinerea. Rhizopus rot or 'leak', caused by the fungus Rhizopus stolonifer, is a common postharvest disease of strawberries usually associated with handling damage.

Pathology and Control of Disease

The fungal pathogen Botrytis cinerea causes grey mould, a commercially damaging disease of strawberry. Grey mold is very common and often causes serious losses in strawberries. This disease affects blossoms and blossom stalks of green or ripe fruit.

Remove the infected plants and destroy them, Clean thoroughly between your plants so that the disease cannot infect your other plants, You can try using sprays with cultural controls on your plants to prevent further infections.

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