

Strawberry (*Fragaria x ananassa* Duch.)

French: Fraisier; Spanish: Fresón; Italian: Fragola; German: Erdbeere

Crop data

Fragaria x ananassa, with large fruit (10-40 g), is by far the most important cultivated species, but other species (e.g. *Fragaria vesca*, with small but better flavoured fruits), may also be grown.

Perennial but, as a crop, more frequently exploited for one year.

It is a typical rosette plant; the petiolate leaves and the inflorescence stalk originate from the short stem, rich in brownish scales (crown). Some axillary buds can develop into branches with long internodes (stolons) which produce a new leaf rosette and adventitious roots at the nodes. The stolons are used for propagation. The root system is mainly located in the upper 20 cm soil layer.

During the rest period strawberry can tolerate very cool conditions (down to -6°C); also during the vegetative and reproductive phases thermal requirements are rather low: zero growth point is near 5 °C; optimum conditions are 10-13 °C at night and 18-22 °C during daytime respectively.

In the Mediterranean area, short day cultivars are planted in summer or autumn; flowering occurs in winter and spring; harvest starts in spring.

Nutrient demand/uptake/removal

Nutrient removal per metric ton of fruit can amount to 6-10 kg N, 2.5-4.0 kg P₂O₅ and 10 or more kg K₂O, with a nutrient ratio of about 2.5:1.0:3.5. Uptake amounts to about 200-250 kg/ha N, 100-150 kg/ha P₂O₅ and 400 kg/ha K₂O.

Plant analysis data

A concentration in the petioles in the range 3 000-10 000 ppm nitrate N (on a dry matter basis) indicates an optimal nutritional status. At higher concentrations vegetative activity, mainly leaf growth, is stimulated to the detriment of fruit production.

Fertilizer practice

Factors to be taken into account are:

- the root system is rather weak and shallow (70 % in the upper 7 cm soil layer), just below the surface in mulched crops;
- the plant prefers light, rather sub-acid soil (pH 5.5-6.5) and suffers from brackish water and/or soil (from both Cl and Na);
- it is more or less susceptible, depending on the cultivar, to chlorosis due to iron deficiency;
- floral bud differentiation, on which the yield depends, occurs early and depends on the nutrient reserves of the plant;
- nutrient absorption is at a maximum during flowering.

Correct practice normally involves:

- use of manure or peat to improve soil fertility and to control pH;
- application of iron salts to calcareous soils to prevent plant chlorosis;

- application of 100 kg/ha N, 100 kg/ha P₂O₅ and 200 kg/ha K₂O before planting;
- topdressing with N and K₂O (50-100 kg/ha), throughout the cycle, normally by fertirrigation.

Slow release fertilizers have proved promising in meeting plant nutrient requirements and reducing the risk of leaching.

Fertilizers which increase the content of Na (e.g. sodium nitrate) or of Cl (e.g. potassium chloride), or of Ca (e.g. calcium nitrate), should be avoided due to the risk of chlorosis.

Application of chelates, or of foliar sprays with iron compounds, may be of use in checking negative effects caused by immobilization of Fe.

For further general information see introduction to chapter 'Temperate Vegetable Crops'.

Further reading

BALDINI, E.; SCARAMUZZI, F.: La fragola. Reda, Rome, Italy (1980)

DARROW, G.M.: The strawberry. Holt, Rinehart and Wiston, New York, USA (1966)

GIULIVO, C.; RAMINA, A.: Aspetti delle esigenze nutritive della fragola. Atti 4° Convegno Nazionale della fragola, Cesena, Italy (1970)

See also references listed at the end of 'Temperate Vegetable Crops'.

Author: G. La Malfa, Istituto di Orticoltura e Floricoltura, Università degli Studi di Catania, Italy