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Eggplant growing

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INTRODUCTION

The eggplant (*Solanum melongena*) is a native of the subtropical areas of south-eastern Asia and was introduced into Europe by early Arab traders. It is a member of the Solanaceae family, which includes other vegetable crops such as tomatoes, potatoes and capsicums. Eggplants have been widely grown in southern Europe, the Middle East and Asia for hundreds of years.

The fruit, also known as aubergine (France), melanzana (Italy) or brinjal (India), is considered something of a delicacy. It can be baked, grilled, fried or boiled, or used in stews or as a garnish.

Queensland is the main producer (3000 tonnes in 1997) followed by New South Wales (1955 tonnes in 1997).

CLIMATE

Eggplant is a summer-growing vegetable that requires warm to hot conditions over a 5–6 month growing period to produce high yields and quality fruit. Periods of cool weather during the growing period will retard plant growth and reduce yields. Affected plants seldom recover,

even if favourable growing conditions return. Young seedlings are sensitive to frost.

The optimum growing temperature range is 21°–30°C, with a maximum of 35°C and a minimum of 18°C. The optimum soil temperature for seed germination is 24°–32°C.

SOIL

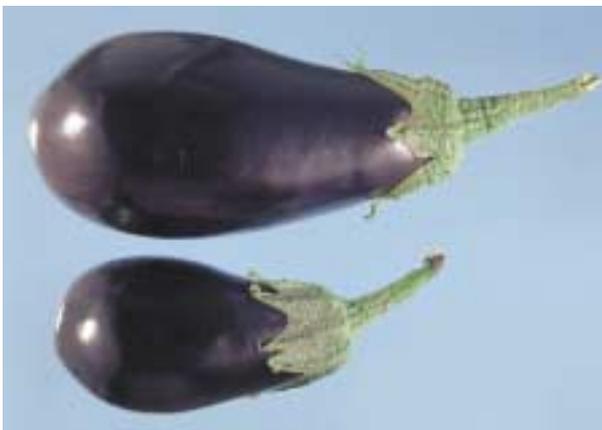
Eggplants are moderately deep rooting and can be grown on a wide range of soils. They do best on light-textured soils such as sandy loams or alluvial soils that are deep and free draining. These soils warm up quickly in spring and are suitable for early plantings. Avoid soils with high clay content.

A soil pH in the range 6.0–7.0 is desirable.

VARIETIES

The plant can be a perennial but in commercial production it is treated as an annual bush. Fruit shapes vary from the more common teardrop shape to round to slim 'sausage' shape. Fruit colour is predominantly glossy dark purple to black but fruit of newer varieties are available in light purple, crimson and cream colours.

Eggplant variety Black Bell, one of the main teardrop shape fruit variety grown around Sydney.





Eggplant variety Baby Finger. One of the main slim shape variety grown around Sydney (also called 'Mini bunching').

The varieties Black Label and Epic have replaced Market Supreme as the main teardrop shape varieties grown around Sydney. Both are high yielding with attractive smooth, glossy, black fruit of good keeping quality.

The main long slim cylindrical varieties are Longo and Baby Fingers. They are also referred to as mini bunching (Lebanese) eggplants (see the photo above).

SEEDLINGS

Eggplants are usually planted in the field as seedlings. The seedlings are purchased from commercial nurseries and need to be ordered at least 10 weeks before planting. Transplant seedlings need to have 6–7 leaves and be 10–12 cm high.

If growing your own seedlings, the following measures will ensure healthy plants.

- Sterilise the growing medium beforehand with steam or registered fumigant.
- Sow seeds in seedbeds with a temperature above 24°C.
- Place growing trays under glass or plastic covers during winter. Eggplants can be raised in seedbeds in the open only when the mean daily temperature is over 21°C.
- To produce 3000 seedlings, sow seeds in rows 10 cm apart with 1.8–2.0 cm between plants in a 10 m² seedbed. A better method is to use cell trays with peatmoss and vermiculite as the growing medium. Between 100 and 150 seedlings are produced from 1 g of seed.
- Maintain care of seedlings to avoid stunting. Insects such as aphids and leafhoppers must be controlled to avoid introducing plant virus diseases.

Seedlings grown under cover will be ready for transplanting 8–10 weeks after sowing.

ESTABLISHMENT

In the Sydney Basin, eggplant seedlings are transplanted from early October to late December. Between 10,000 and 18,000 plants are needed per hectare, depending on the variety.

Land preparation should start several months before transplanting. Eggplants are best transplanted into raised beds for better drainage and only when soil temperature is above 20°C. Black plastic mulch is widely used in early crops to help to raise soil temperatures and control weeds.

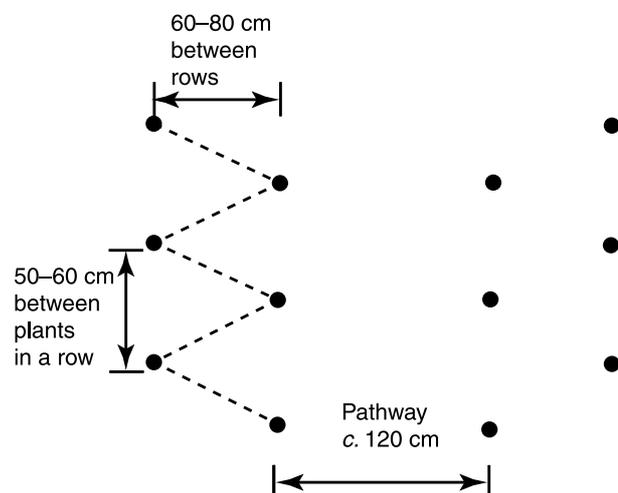
Plant spacing will depend on the vigour of the variety. For single or double row planting of smaller growing varieties, plant spacing can be set at 50–60 cm apart within rows and 60–80 cm between rows. Larger growing varieties do best when planted 60–80 cm apart with 100–120 cm between rows in an alternate planting pattern. Spacings for smaller growing varieties and the alternate positioning of the plants in the two rows are shown in the diagram.

Each plant is trained to three leaders forking from the base of the plant.

Eggplants can also be grown in various hydroponic systems. The most common system used around Sydney is in 20 L black plastic bags containing a commercial potting mixture, one plant per bag. The bags are placed on raised beds covered with black plastic and irrigated by one dripper per bag. The drippers provide both water and plant nutrients. See the photo over.

A trellis support system is needed to keep the fruit off the ground and to reduce wind damage. The most common system used in two-row plantings is stakes (steel or wood) on the outside rows with one or two lines of wires (2 mm) or heavy duty twine supported by ties. Stakes are placed 3–4 m apart with a strainer post at each end of the row. Branches with fruit are trained up between the wires or twine.

Planting pattern for smaller varieties of eggplant



WEED CONTROL

Several knockdown herbicides are registered for use on eggplants but weed control is mainly by shallow inter-row cultivation until the plants are well enough established to smother the weeds. Black plastic mulch is now widely used to assist in managing weeds within rows.

IRRIGATION

Irrigation is essential during the long growing period. Excessive dry periods can cause shedding of flowers and developing fruit. The amount of irrigation water needed depends on soil type, growing conditions and crop growing methods such as the use of plastic mulch.

As a guide, crops planted in late October around Sydney using trickle irrigation may require up to 2–3 ML of water per hectare. Irrigation water should be of good quality with an electrical conductivity (EC) of less than 2.0 mS/cm.

Soil moisture sensors, such as tensiometers, can be used to measure root zone moisture level and assist in developing an irrigation program. Irrigation should be applied when tensiometers show readings of 30–35 centibars

FERTILISER

If the nutrient status of the soil is not known, a soil analysis 3–4 months before planting is advised. Leaf analysis of mature leaves in the first crop can help to fine-tune a fertiliser program.

Adjust soil pH to 6.0–6.8 by applying and incorporating agricultural lime or dolomite several weeks before transplanting.

The nutrient requirement of eggplants is similar to that of tomatoes. The main object is to maintain a balanced level of nutrition throughout the long growing period.

Organic manure, such as poultry manure, applied at 12–15 t/ha 4–6 weeks before transplanting, will supply organic matter, add nutrients, improve soil structure and help to retain moisture in the soil. Combined with 200–300 kg/ha superphosphate, this is sufficient as a pre-plant fertiliser program. If using only artificial fertilisers, apply a low-analysis N:P:K mixture, such as 5:7:4 at 1200–1500 kg/ha, before transplanting.

Regular applications of nitrogen at 25–30 kg/ha (60–70 kg urea) are needed during the growing season. Apply the first when plants are 30 cm high and the second after the first set of fruit then at 1–2 week intervals, depending on the growing conditions.

On lighter soils, which are readily leached, extra nitrogen and potassium should be applied. Several applications of potassium nitrate at up to 200 kg/ha can be used.

Eggplants grown around Sydney benefit from foliar sprays of the nutrients molybdenum and calcium. Apply a 0.1% solution of ammonium molybdate at 1 g/L at the five-leaf stage and again 15 days after transplanting. Alternatively, sodium molybdate can be used at 1.5 g/L. Calcium nitrate or commercial products containing calcium can be applied after the main fruit set period.

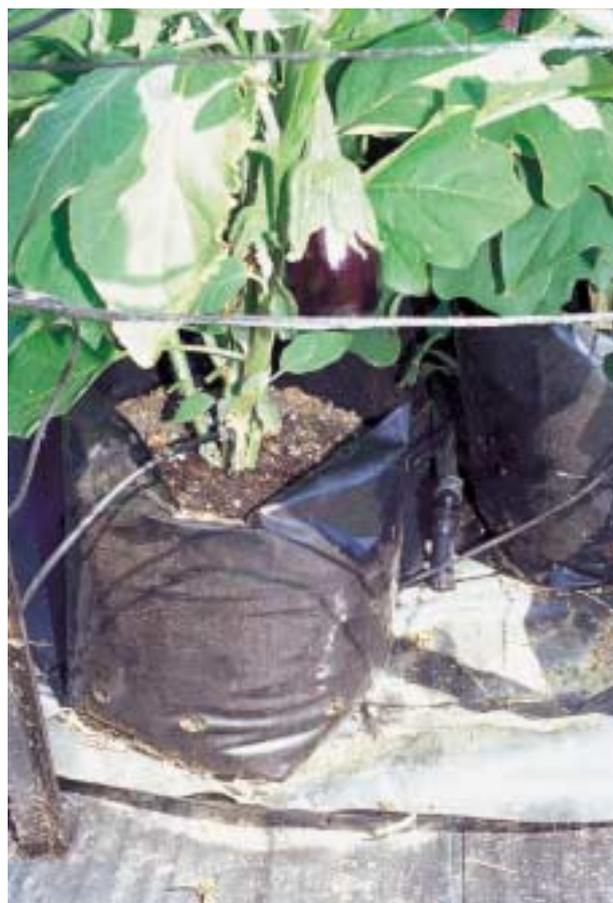
The trend in recent years is to apply soluble fertilisers via an irrigation system (fertigation). Technology is now available to accurately apply nutrients into the root zone for optimum plant growth and yield. The benefits are savings in labour and fertiliser cost, more efficient use of water and nutrients, and reduced leaching of nutrients such as nitrogen into waterways and ground water.

DISEASES AND PESTS

The main pests that affect eggplants are:

- fruit and flowers – tomato caterpillars, eggplant caterpillars, fruit flies, aphids, looper caterpillars
- leaves – leaf-eating ladybirds, spider mites, tomato russet mites
- roots – cutworms, root knot nematodes.

Drip irrigation providing both water and nutrients to the eggplant variety Black Bell growing in 20L plastic bags. Note heavy duty plastic mulch on the ground and twine supporting branches with fruit.



Diseases cause fewer losses in eggplants than do insect pests. Verticillium wilt is the most serious disease. Symptoms include discolouration of the conducting tissues in the lower stem and roots of plants, wilting and eventual death of the plant. Avoid planting in areas known to be affected or after tomatoes, potatoes or capsicums. Practise crop rotation with vegetables such as peas and beans.

Anthracnose is the main fruit disease that attacks ripening fruit, causing circular sunken spots. The main leaf diseases are target spot and leaf blight.

There is a limited range of plant protection products registered for the use on eggplants in New South Wales. Check with your nearest NSW Agriculture district horticulturist or InfoPest® database for products that can be used to manage pests and diseases in eggplants.

HARVESTING AND MARKETING

Fruit size is determined by variety and market requirements. Traditional teardrop shape fruit varieties are ready for harvest 50–70 days after transplanting or one month after fruit set. These varieties can crop for up to five months. Market trends have been towards smaller size fruit of 7–10 cm diameter and 12–15 cm long.

Two row beds of the variety Epic growing in 20L plastic bags with star pickets for trellis support.



Long, slim, cylindrical varieties can be picked when 1–2 cm in diameter and 5–10 cm long.

Fruit is harvested when it reaches a glossy deep purple colour but before seeds begin to harden and turn brown. Over-mature fruit have a dull colour, crinkled skin, spongy feel and wrinkled stem.

Cut the stem with a sharp knife or secateurs, leaving a short piece of stem attached to the fruit. Protective clothing should be worn when harvesting as there are small spines around the calyx and on leaves.

Handle fruit carefully, avoiding damage to other fruits, particularly from the spiny stems. Pick fruit in the cool part of the day and avoid prolonged exposure to the sun. Place in a cool-room, if not packed immediately, at 7°–10°C and 90–95% relative humidity. Eggplants do not store well. The maximum life in a coolroom is 5–7 days.

Eggplants will crop over a long period of time and yield 5000–8000 18 L cartons (6–8 kg) containing 12–20 fruit per carton.

Eggplants from New South Wales are usually available from late December through to May and are mostly sold on the domestic markets via Sydney markets. Consumers from Mediterranean and middle eastern backgrounds are the main buyers.

Consumption of eggplant in Australia is expected to increase moderately over the next decade.

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The information contained in this publication is based on knowledge and understanding at the time of writing (March 2003). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of NSW Agriculture or the user's independent adviser.