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COMMERCIAL PRODUCTION OF EGG-PLANT

By J. FALLON, Senior Vegetable Adviser

The egg-plant or aubergine (*Solanum melongena*) is a sub-tropical plant which is not only very tender to frost and low temperature, but requires a long growing season.

Until recently egg-plant was not well known as a market garden crop in Western Australia, but production is steadily increasing to meet a growing demand. Cooked in a variety of ways, egg-plant is an addition to the range of locally available vegetables and is regarded by many as something of a delicacy. A continuous supply of fruit to the local market is achieved by growing winter crops in the frost free Carnarvon area.

Climate

Egg-plants require warm conditions over a 5 month growing period to give satisfactory crops of high quality fruit. The optimum monthly average temperature range is 70 to 85°F.

As well as being sensitive to frost, egg-plants may be damaged or seriously retarded by long periods of cool weather, and are more sensitive than tomatoes in this respect. Plants retarded by cold tend to harden and, even if good weather follows, seldom attain the vigorous growth required for high yields of good quality fruit.

Mean daily temperatures should be at least 60°F for successful field establishment of egg-plant, and it is usually possible to transplant seedlings by October in the Metropolitan area. Higher temperatures at Carnarvon enable planting out with reasonable safety at any time of the year although in some winters growth is slow during July.

Soils

Egg-plants are moderately deep rooting and lighter textured free draining soils are better than soils with a high clay content. Lighter soils also warm up quickly in spring and are more suitable for early plantings.

Raising seedlings

During the cooler periods of the year, seedlings are best raised in trays in glass or plastic covered frames which have a north or north-easterly aspect. When the mean daily temperature is about 70°F or higher the plants may be raised in seed beds in the open.

Seed should be soaked in hot water at 126°F for 30 minutes and then dusted with captan, thiram or spergon to prevent damping off diseases. A description of the method of hot water seed treatment is given in Department of Agriculture Bulletin No. 3395.

Seed beds or boxes should be treated with a suitable fumigant, such as methyl bromide which will kill nematodes, most weed seeds and soil borne plant pathogens. Details of methyl bromide seed bed treatment are given in Department of Agriculture Bulletin No. 2857.

Seeds should be sown fairly thickly, one quarter of an inch deep, in rows 2 inches apart and uniformly covered with soil. About 5 ounces of seed will produce enough seedlings to plant 1 acre.

If seedlings are to be grown in seed beds to go through to transplanting into the field with—
out pricking out, seed may be drill sown in rows 4 inches apart and later thinned to give a spacing of at least 2 inches between plants.

At 85°F germination will take place in about 5 days, while at temperatures around 65°F it may take as long as 15 days. Germination and emergence will be delayed if the seed is covered with more than half an inch of soil.

Ideal seed bed temperatures are 70 to 80°F during the day and 65 to 70°F at night.

Seedlings grown in open beds in warm weather will be ready for transplanting in 6 to 8 weeks. About 8 to 10 weeks should be allowed from sowing to transplanting when plants are raised in seedling boxes for early planting.

Seedlings in boxes are big enough to be pricked out in 2 to 3 weeks and should be spaced 2 inches apart in seed beds or trays which have been fumigated. This spacing may use a lot of room in the nursery area, but the plants will establish quicker in the field and reach maturity earlier than those which have been crowded.

Careful attention should be given to watering, temperature control, and fertilising so that the young developing seedlings are not stunted. Liquid fertilisers are probably the best to keep the plants growing steadily. There are many proprietary liquid fertilisers available, or one may be made by dissolving 1 ounce of nitro-phoska or similar fertiliser containing nitrogen, phosphate and potash in 4 gallons of water.

Insect pests such as leaf hoppers or aphids must be kept under control to avoid the introduction of spotted wilt and other virus disorders.

**Planting out and cultivation**

Daily temperatures should be favourable for rapid growth before planting out. Seedlings require more care than tomato seedlings, but suffer little setback if taken from the seed bed with a block of soil around the stem and roots by running a heavy knife both ways between the seed bed rows.

Small growing varieties such as Early Long Purple can be set out 18 inches apart in rows 36 inches apart. Varieties such as Market Supreme and some hybrid varieties develop large plants and 24 by 48 inch spacing is best.

A good method for easy management is to have rows in pairs 24 inches apart with pathways 48 to 54 inches wide between pairs. The plants can be 18 to 24 inches apart in the rows depending on the variety used.

Shallow inter-row cultivation for weed control and to work in fertilisers is usually necessary until the plants are well enough established to smother weed growth. Alternatively a herbicide can be used at transplanting, and dacthal at the rate of 10 lb per acre is recommended.

**Varieties**

Relatively few varieties of egg-plant are listed by seedmen. Two currently available are Early Long Purple and Market Supreme, of which the latter is more popular.

**Early Long Purple**

This is an early maturing variety, which takes 8 to 10 weeks from transplanting to first harvest in the Metropolitan area, and the plants are smaller than those of Market Supreme. The fruit is 7 inches long and 2½ inches in diameter, smooth and dark purple in colour with an average weight of 7 to 8 ounces.

**Market Supreme**

A high yielding variety which crops over a long period, with first harvest 10 to 12 weeks after transplanting. The fruit is a deep glossy purple colour, 7 to 8 inches long by 4 to 5 inches wide, and weighs about 16 ounces when mature.

A high yielding eggplant crop planted in pairs of rows. Over a 10-week harvest period, marketable fruit picked exceeded 30 tons per acre.
Hybrid varieties

Some recently released hybrids are now available from seedsmen. Trials at the Vegetable Research Station, Medina, have shown a range of fruit shape, earliness and yielding ability in the hybrids.

Money Maker and Black Diamond produce a higher and earlier yield of fruit than Early Long Purple which for many years has been the best early variety available.

Mission Belle produces fruit similar in size, shape, quality and maturity to that of Market Supreme, with 25 per cent higher yields.

Other hybrids included in trials and which are as yet unnamed give promise of further increases in yield, appearance and quality.

Manuring and fertilising

The egg-plant is similar to tomato in its nutrient requirements. The most important factor is to maintain a high level of nutrition over the long growing season.

On the sandy soils of the Metropolitan area an organic manure such as poultry manure will contribute nutrients and greatly improve the water and fertiliser holding capacity. Up to 15 tons per acre may be used and should be ploughed in thoroughly some weeks before planting out.

All the plant’s requirements can be met with carefully planned chemical fertiliser applications.

Phosphate requirements of egg-plant are not high and, as it is not as readily leached as other nutrients, a single dressing of 5 or 6 cwt of superphosphate or potato manure broadcast and hoed in before planting will provide all the crop’s requirement of this element.

Nitrogen and potash are readily leached on sandy soils and the interval between applications should not exceed 14 days. If these are supplied in the forms of ammonium nitrate and sulphate of potash, about 10 cwt per acre of each would be needed over the 20-week growing period.

Fertiliser needs are smallest during the first and last months of growth, so that only one quarter of the total dressing should be given during these months and one quarter in each of the other 3 months.

Minor elements

Although organic manures contain some minor elements, it is a wise precaution to use a minor element mixture. The following mixture is sufficient for 1 acre:

<table>
<thead>
<tr>
<th>Minor Element</th>
<th>Rate (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese sulphate</td>
<td>45</td>
</tr>
<tr>
<td>Epsom salts</td>
<td>50</td>
</tr>
<tr>
<td>Borax</td>
<td>30</td>
</tr>
<tr>
<td>Iron sulphate</td>
<td>30</td>
</tr>
<tr>
<td>Bluestone</td>
<td>30</td>
</tr>
<tr>
<td>Zinc sulphate</td>
<td>25</td>
</tr>
<tr>
<td>Sodium molybdate</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>212</strong></td>
</tr>
</tbody>
</table>

One half of the total quantity should be applied with superphosphate or potato manure before planting out and the rest in 2 equal dressings 6 and 10 weeks after transplanting.

Harvesting

Fruit stems are thick, tough and spiny, and should be cut with secateurs or a sharp knife leaving the fleshy calyx and a short piece of stem attached to the fruit. They must be handled carefully to avoid damage, particu-
larly by puncturing from stems of other fruit. After harvesting the fruit should be carefully wiped to give a clean, bright appearance and then graded before packing.

Egg-plant will crop over a long period and yields up to 40 tons per acre have been obtained in trials at the Medina Research Station.

Diseases

The serious diseases which can attack eggplant include leaf spot, fruit rot and wilt. Seed and seed bed treatments and rotation are the first steps for the production of healthy crops. Where a disease outbreak occurs in seed beds or in the field, advice should be sought immediately from the Department of Agriculture.

Many of the pests of tomatoes and potatoes attack egg-plants, and regular spraying to control insects is necessary to prevent transmission of virus disorders. The important insect pests are caterpillars, leaf-hoppers and spider mites, and control measures are shown in the table.

Control of insect pests of egg-plant.

<table>
<thead>
<tr>
<th>INSECT PEST</th>
<th>INSECTICIDE</th>
<th>CONCENTRATION</th>
<th>WITHHOLDING PERIOD</th>
<th>WHEN TO APPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg-fruit caterpillar, loopers, budworms and cutworms</td>
<td>carbaryl</td>
<td>per cent.</td>
<td>days</td>
<td>7-10 days intervals</td>
</tr>
<tr>
<td></td>
<td>trichlorphon</td>
<td>0·1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0·1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Leaf-hoppers, thrips and aphids</td>
<td>dimethoate</td>
<td>0·03</td>
<td>7</td>
<td>7-10 days intervals</td>
</tr>
<tr>
<td></td>
<td>maldison</td>
<td>0·05</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Spider mites</td>
<td>tetradifon</td>
<td>0·02</td>
<td>3</td>
<td>Tetradifon is effective</td>
</tr>
<tr>
<td></td>
<td>dicofol</td>
<td>0·04</td>
<td>7</td>
<td>against eggs and immature</td>
</tr>
<tr>
<td></td>
<td>demeton-S-methyl</td>
<td>0·025</td>
<td>21</td>
<td>forms of spider mites and</td>
</tr>
<tr>
<td></td>
<td>carbophenothion</td>
<td>0·03</td>
<td>21</td>
<td>must be applied before</td>
</tr>
<tr>
<td></td>
<td>cyclosulfyne</td>
<td>0·03</td>
<td>7</td>
<td>adult populations appear.</td>
</tr>
</tbody>
</table>

The insecticides shown in the table are available in the following trade products—carbaryl (Bugmaster, Dicarbam, Le-baryl, Pestone, Resistox, Savyon, Septene, Sevin, Zevilon); trichlorphon (Dipterex); dimethoate (Diostop, Ridmite, Rogor); maldison (Malathion, Exterm M, Malagran, Malaprene, Malathox, Mal-Licide, Terramal, Terrathion); tetradifon (Tedion); dicofol (Kelthane); demeton-S-methyl (Metasystox "i"); carbophenothion (Trithion); cyclosulfyne (Omite).

FURTHER ARTICLES IN RAPESEED SERIES

There will be two more articles this year in the series on rapeseed production:

4. Grain Quality
   By G. R. Crosbie and M. L. Poole.
   A coverage of the standards required by buyers and the means of meeting these standards.—September Journal of Agriculture.

5. Harvesting Methods
   By M. L. Poole.
   Practical points on times and methods of harvesting rapeseed.—October Journal of Agriculture.