

### **Introduction**

There are two types of tomato: those for greenhouse production and those for outdoor production. The former are grown as cordons (single-stemmed), whilst outdoor types are either determinate (bushy) or indeterminate (vine), however the vine type may be compact, intermediate or tall. Greenhouse varieties can be either grown without heat after planting, or with heat for earlier or later cropping. In an unheated greenhouse it is necessary to wait until the spring before planting in their final positions, to allow soil temperatures to reach 14oC. If you are prepared to pay the heating costs, have good growing conditions and light levels, and are prepared to give constant care and attention to the crop, then it is possible to plant as early as January, to begin cropping from April. The earlier the crop is planted the earlier the cropping can begin but also the higher the heating cost will be. A follow-on crop planted out by early May/June could be harvested by July/August. Tomato plants require a minimum night temperature of 14oC with a day temperature of approximately 18oC. On very dull days lower the day temperature to approximately 16oC. Ventilation should occur at 23oC.

### **Propagation**

During winter it takes about 12-14 weeks from seed sowing to planting, and a further 6-7 weeks until the first fruit is ripe. Late season crops can take as little as 6-7 weeks from sowing to planting out, given the right growing conditions. Seed is sown thinly into a seed tray, covered lightly, watered and placed out of light at 18oC. For Rockwool culture the seed is sown directly into propagating tubes, which fit into larger blocks for planting out. Germination takes 8-11 days.

As soon as seedlings are large enough to handle, prick out (before true leaves develop). Use lattice pots, peat pots, peat blocks or Rockwool. Transplants should be placed pot thick until spaced to 24cm x 24cm, so that their leaves never overlap. Temperatures during this stage should be 18oC, 14oC night. A well-grown plant should be sturdy, and the flowers on the first truss open.

There are a number of growing methods used for tomatoes:

- 1). Border soil
- 2). Grow bags
- 3). Ring culture
- 4). Rockwool

### **Border soil**

The border should be prepared during the winter, when checks on pH, salt concentration, nutrient levels and sterilisation can be checked and adjusted as necessary. The ideal pH is 6-6.5. Apply liquid feed with each watering, strength according to the crop. If the soil has pest and disease problems, a grafted rootstock can be used.

### **Growbags**

Growbags warm up quickly. They last for one growing season and are then replaced. Watering may be difficult, and they require strict nutritional control. The bags are placed on white polythene, at the required spacing, with three plants per bag.

### **Ring culture**

The 'ring' refers to the 23cm 'whalehide' (bituminous paper) pot, usually without a base, which is filled with growing medium. The rings are spaced 50-60cm apart, on top of a 15cm layer of sterilised aggregate, into which the plants root.

### **Hydroponics**

These systems depend upon blocks of Rockwool (or perlite) isolated from the soil beneath by polythene, and from each other to avoid the spread of pest and disease.

All the water and liquid nutrients are applied via a drip system, which is strictly controlled to feed and water as required. The Rockwool slabs sit on polystyrene to prevent heat loss, with alkathene pipes running between the two to provide a root zone temperature of 23-25°C. The Rockwool slabs are placed end to end, and wrapped in polythene. The plants are spaced three to a slab, depending upon slab size and desired plant density, with one drip nozzle per plant. It may be necessary to make slits in the sides of the polythene to allow excess nutrients to drain off.

### **Pollination**

Methods used to distribute the pollen include: taping the supporting canes or ties vigorously, misting the plants and damping down to raise the humidity in the glasshouse, using a battery-operated 'electric bee' to shake the plants, and using commercially supplied bumble bee colonies, which is the least labour intensive option.

### **Support and development**

Support developing stems with twine as they grow. Various training systems are used with tomatoes, but for all it is desirable to have the top metre of growth vertical.

Side-shoot removal must be carried out from the start, restricting the plant to one main stem. Lower leaves should be removed as they start yellowing, which aids fruit ripening and improves air movement. Harvesting time depends upon the intended use for the fruit; local fresh sales can be picked later than those which have to be graded, packed and transported some distance.

#### Pest and diseases

Aphids (mainly glasshouse potato aphid): spread viral diseases

Leafminer

Potato cyst nematode

Red spider mite

Root-knot nematode

Whitefly

Thrips (spread viral diseases)

Various root rots

Botrytis (Grey mould)

Physiological disorders can be quite common, and can develop quickly; fortunately in most cases they can be easily rectified once diagnosed. Common problems include magnesium deficiency, blossom end rot, and greenback.

### **Further research**

A large amount of research has been, and continues to be, carried on tomato production, especially for glasshouse crops. There is also a wide collection of published material available dealing with every aspect of tomato production, from propagation through to nutrient manipulation, both in books and online.

Information provided for guidance only, as cultural practices and climatic circumstances vary.