

INTRODUCTION

Polythene tunnels (polytunnels) offer a relatively cheap form of protected growing. They offer a two to three month extension to the growing season and will allow more exotic crops to be grown successfully. A range of tunnels is available. Tunnels should be chosen to suit site and cropping requirements. Four tunnels types are considered below.

- **Fixed tunnels** - are permanent tunnels with a strong enough structure to stand most weather events especially if given some shelter. They can be dug into the ground but more commonly these days they are fitted with a lower skirt that can be opened or netted for ventilation. Crops are usually grown in bags or troughs, not in the soil. These tunnels are very versatile and can be used for early soft fruits, especially strawberries, but could also be used for bedding plants. Longer-term vegetable crops such as tomatoes are another option.
- **Spanish tunnels** - are temporary covers. However some farms do leave them in place and crop out of soil as in fixed tunnels. If properly constructed Spanish tunnels can stand a remarkable level of wind but they will not stand gales. Usually the polythene is removed over the winter and the tunnel is re-skinned in the spring. Spanish tunnels offer relatively cheap cover and can be used for forcing if the sides and ends are sealed up well in early spring and horticultural fleece is also used to provide added protection from frosts.
- **Telescopic tunnels** - in essence these are Spanish tunnels but in this case the hoops can be dropped down the leg so the polythene meets the soil and gives a better seal. This in turn raises the temperature so the crop is earlier. As the crop develops and the weather gets warmer the roof can be lifted which gives the large air volume and accessibility of the Spanish tunnel.
- **French Tunnels** – are temporary individual tunnels where the polythene meets the ground but is secured with ropes rather than dug in. These are useful for early crops and can be moved around the site. Although less popular than Spanish tunnels for volume production, they are a useful option for pick your own type outlets.

PLANNING PERMISSION

Recent planning problems have been encountered with tunnels. It is best to site tunnels as unobtrusively as possible and to involve local planners from the outset. Many quality assurance schemes have now developed codes of best practice and growers should consult their appropriate agency. The NFU and British Summer Fruits Association have also produced a code of practice for the use of polytunnels in the production of soft fruit.

CROPPING

Cropping in polytunnels follows the same principles as any other cropping system. Crops need to be rotated, so the area in the tunnel should be split up and the cropping varied to give the soil a rest and prevent the build up of pests and diseases.

The easiest form of cropping is to use the soil in the tunnel. If the soil can be improved with organic matter yields will be better.

CHOICE OF CROPS

Box 1 Crops suitable for growing in polytunnels

Aubergines	Garlic
Carrots	Herbs
Celery	Melons
Climbing French beans	Okra
Cucumber	Peppers
Courgettes	Salad Leaves
Early Potatoes	Strawberries (bags or troughs)
Fennel	Tomatoes

Tunnels can be used to extend the season for most crops. For example carrots could be sown in October and be ready as bunched carrots the following May. Early potatoes can be planted in January (protected with fleece). They will be ready in May.

Tunnels can also be used for more exotic crops such as cucumbers, chillies, peppers, aubergines and tomatoes. It is

possible to produce these crops without heat in the summer. However, some heat in propagation will be a great benefit.

It is possible to grow multiple crops in a single year. For example, if tomatoes or other summer crops have been grown, they can be followed with salad leaves to crop through the winter. Hardy salads such as rocket, mizuna, mibuna, pak choi, coriander, dill, corn salad and red mustard can be grown from seed drilled into the soil borders.

ESTABLISHMENT

For summer crops, seed is sown from early March in a heated house or propagator. A commercial seed compost should be used. The ideal temperature for germination is 20°C, with the plants grown on at no lower than 15°C. Once the plants have germinated they can be pricked out into 7cm pots containing a commercial pot and bedding compost.

Whilst the seedlings are growing on, the tunnel should be prepared for planting. If growing in the soil organic matter should be incorporated, and a general fertiliser, such as 17-17-17 at 50g/m² applied. If soil analysis results are available, they should be used as a guide to fertiliser requirements.

Growing the plants through polythene mulch or Mypex will minimise problems with weeds. A line of trickle irrigation for each row of plants can also be put under the cover, but ensure the pipe can be found to avoid puncturing it when planting.\ to avoid puncturing the pipe.

Planting should take place in April when the main risk of frost has passed. However late frosts may still occur and either heat or fleece will be needed to prevent damage.

MANAGEMENT

During most of the Welsh summer, the aim will be to keep as much heat in the tunnel as possible. If the temperature rises above 23°C the tunnel should be ventilated by side skirts or doors and louvres. It can become very humid in a tunnel so every morning open up and purge the air but close up again if cool.

Tomatoes and cucumbers need support so a string can be tied to the stem or a small stake by the plant. This will require a 12g wire for each row fixed into the roof either on a framework or tied to each tunnel hoop and anchored well at each end. The tomatoes and cucumbers are then twisted up the string and side shoots are removed.

Peppers, chillies and aubergines may also need a support, such as a bamboo cane or a string, to keep the path clear.

Water through the trickle irrigation and try and keep the soil moist but not soaking.

Feed can be introduced via a dilutor as the crop needs it. Usually a high potash to nitrate feed is given such as potassium nitrate, but magnesium sulphate may also be needed. Proprietary feeds are available and can be used. The idea is to top up the soil and keep a balance to the crop.

PLANTING TO HARVEST TIMINGS

In a trial done by ADAS in 2006 seeds of cucumber, tomatoes, chillies, sweet peppers and aubergines were sown at the beginning of March in a heated glasshouse and the trial was planted out on the 25th April in a cold Spanish tunnel. Troughs of compost were used and the irrigation and feed were as per an attached strawberry crop.

The plants developed well and grew quickly despite a poor May and early June. The first to pick were cucumbers which were ready on the 16th June (52 days) with tomatoes and green chillies following on the 12th July (78 days). Sweet peppers were ready on the 20th July (86 days) by which time red chillies and aubergines were also available. The crops were harvested until the end of October.