Factsheet

Protected Cropping – Systems and Regulations

System Design

The type and scale of market largely defines the system used. Broadly speaking there are two types of system although there are a small number of growers that fall between the extremes.

Large specialized glasshouse units; using modern technology for climate and irrigation control, growing a small number of crops. The grower aims to maximize wholesale value through predictability, shelf life, efficient labour and high volume seasonal output. Such operations are often reliant on bought-in fertility due to the high crop demands and difficulties in generating or recycling nutrients from the holding. Specialist technology for the management of soil fertility, pests and disease becomes more viable at this scale.

Smaller scale growers for whom the protected environment adds options to a largely outdoor operation. Using mostly polytunnels, they grow a wide variety of crops to extend the season and offer choice to the retail market. Investment in technology is often not justified by the crop value. Although yield is important, offering customers a range of crops can be the key to success, with a closer connection to the farm. Such operations can be more self-sufficient for fertility.

Glass versus Polythene tunnels

	Advantages	**Disadvantages**
Glass	• Better light quality • Less condensation • Longer life and stronger • Better ability to vent, including with automatic systems • Easier to collect rainwater from	• Expensive to build and maintain • Potentially dangerous – though new glass is safer • Site must be level • Excess direct sunlight can cause problems for some crops (though screens and shading paints can be used
Plastic	• Cheap to buy and reskin • Easy to erect and maintain • Range of films available with different properties • Can erect on sloping sites – even an advantage to have a slight slope as helps ventilation	• Fragile – eg wind / snow • Light quality (though current films better than they were) • Water collection more tricky, particularly on single spans • Usually colder at night than glass, and more difficult to heat.

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Different polythenes and their qualities

% Light Transmission	Most companies offer a range of films with different PAR[1] light transmission. For most horticultural crops you want as much light as possible, however for some crops that need shade consider a reduced light transmission or even green or blue tunnel.
Ultra Violet [UV] Transmission - Full	Full transmission allows more UV through the film and encourages stronger bushier plants.
Ultra Violet [UV] Transmission - Blocked	Many diseases such as mildew and Botrytis need UV to reproduce and survive, so some companies have developed a film that blocks UV with the aim of controlling these diseases.
Thermic films	These films aim to reduce frost damage by reflecting back the short wave infra-red stored during the day which is then released as long wave infrared at night from the plants and soil.
Anti Fog	Designed to reduce mist in the atmosphere, particularly good if you are on a site that suffers with morning mists, or if ventilation is a problem
Anti Drip	Designed to make the water run down the cover to the edge of the tunnel rather than drip directly onto the plants – this helps to reduce disease by keeping plant leaves dry.

[1] Photosynthetically active radiation

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Cleaning

A pressure washer can be used to clean glasshouses, remove any moss manually and use a long handled broom to clean the roof, ideally just before rainfall. Ensure drain holes and gutters are kept clear. Polytunnels can be cleaned using a length of material such as some old crop fleece. A person either side holding an end each and moving along the wetted structure with a flossing action will remove algae from the top then the sides can be brushed.

Although expensive, steam/hot water or foam treatments are effective.

Organic Certification and Standards

Following a public consultation in 2010 the Soil Association standards for protected cropping were redefined to give growers clear principled guidelines yet allowing for the practicalities of commercial production.

The standards are less prescriptive for protected cropping for several reasons: The demand for fertility is higher due to a longer, warmer season, the types of crops grown and reduced options for fertility building leys. Risk of nutrient loss through leaching is less due to control over irrigation and the investment in infrastructure and ongoing maintenance places a greater imperative on productivity than for an equivalent outdoor space. Larger operations often need to specialize to stay viable and although mono cropping is discouraged, if a system can be demonstrated to work within the standards, a minimal rotation is acceptable for many crops. This is defined within Standards 5.1.13 and 5.2.
Fertility inputs need to be justified within a 'fertility management plan' and the matrix table under standard 5.2.2 is a useful tool for assessing the suitability of inputs for organic production.
Technical data sheets are available for crop protection and fertility products for organic growing, however these should be seen as 'tweaks' to a system which is largely reliant on the rotation, well-made compost and good management of the soil, ecology, crop and climate.
The greenhouse environment allows for the effective use of biological control agents and developments in this field have improved exponentially over the last decade. If correctly applied with guidance from a biological control expert, this should leave few instances where approved pesticides need to be employed.

Aside from the additional standards outlined in 5.2 protected systems are expected to follow the wider horticultural standards (2012 version 16.7 at the time of writing).

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Other publications in the protected cropping series

Although crop covers and temporary cloches can also be considered 'protection' they are not covered in these guides which are aimed at permanent structures, as covered by the additional protected cropping standards [2]

Systems and Regulations

Business and Costing

Crop Timings

Disease

Pests

Example Rotations

Managing Soil and Crop

Managing the environment

Optimising Fertility

Weeds

[2] SA standards 5:2

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