Canterbury Organic 'Growing Under Cover Cover/Protected Cropping'

Workshop May 2007
Location: Marshlands, Christchurch.
Presenter: Tony Mallard

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1. Site Selection Factors to consider:

- Night temperatures – temperatures are lower if the growing area is out in open.
- Frost – severity, timing and frequency. These are an issue at Mallards.
- Shelter essential
- Maximum sun
- Good drainage and fertility.

2. Types of Protection

Pervious Cloth

'Microclima' is laid over crops using the lightest grade. Crops include early pumpkin, tomato and sweet corn and winter crops (brassicas, carrots, spring onions, spinach and lettuce). A trench is made for the plants then microclima is stretched over the edges of the trench.

Features:

- Easy to handle and light weight
- Pervious to moisture
- Gives about 1 ½ to 2 degree rise in temp where covered.
- Can protect from minus 6 degrees with 3 covers.
- Protects against birds, wind damage, pests, frost and soil compaction from rain.
- Lowers evaporation
- Does not prevent bolting.
- Lasts 3-9 years.

Problems:
Wind and occasional mini tornadoes at Mallards can blow off covers and continual flapping can damage leafy crops.
Warmer temperatures can increase incidence of aphids in spring.

Cloches or cold Frames

Generally are covered with glass or polythene.
Features:

- Good for small seedlings and seed propagation
- Simple to construct or shift.
- Provides protection from excess rain, wind, hail, frosts, and birds.
- Increases temperatures and easy to vent.

Portable Tunnels

Features:

- Offer many features of permanent greenhouse except that they can be more vulnerable to wind and less head room.
- No permit needed.
- 2 people can shift a 100m portable tunnel in a very full day. Quick and easy to pack down and can sell.
- Can place inside a larger more permanent structure for added protection.
- Ability to move lowers the incidence of soils borne diseases and can shift over an existing crop at end of summer for frost protection.
- Can cover when most needed – winter and early spring.

- Ventilation is relatively simple by lifting up one side or ends, but during high winds it is best to close to protect crop and for tunnel stability.
- White fly is not a problem because tunnel is moved.
- Multiple tunnels should be located so that shifts can be done sideways with minimum distance.

Permanent Tunnels, single and twin skin.
Features:

- More spacious therefore allowing for wiring of crops such as tomatoes and cucumber.
- Can have twin skin. Roof venting. Can heat in winter. A new greenhouse takes 1-2 years to get white fly.

Glasshouses

Good light transmission though must shade in summer.
A new greenhouse takes 1 to 2 years to get white fly.

3. Soil Temperatures & Air Temperatures

Soil temperatures are more important than air temperatures. They need to be adequate and sustained. This can be achieved during early spring with dull weather by keeping greenhouses closed. Other options are use of black plastic mulch, soil heating using cables or stored warm water, microclima cloth and flame gun for weed control and lessens frost incidence.

4. Planting Times

Choose the right cultivars e4specially when aiming for beginning and end of growing season. A week of dull weather when planted and can loose soil temp - later plantings are better. Do not sow carrots from late autumn to early Oct.

5. Choice of Cultivars

Choose disease resistant varieties. Lettuce aphid has been here for 5 years – to keep lettuce aphid free get resistant varieties (crossed with wild lettuce that's resistant). Select for productivity, flavour, bold resistance and specific disease resistance.

6. Diseases and Pests

Keep a healthy soil through rotation. Endomorphic fungi gets rid of aphids in late spring. Encarcia wasp (predatory wasp of white fly) needs 20 degree minimum, white fly needs 15 degree minimum. During late spring keep monitoring aphid build up.
Instead of putting on a synthetic chemical, generate something to be part of the system and naturally occurring- a balancing agent.

7. Irrigation

Mallards site has a high water table therefore it is a balance between having sufficient for plant growth and too much water resulting in sappy growth with associated weeds. Keep the plants a little stressed early on so roots go down to the water table.

8. Shading

Sunburn is a problem in the glasshouse if shading is not used.

9. Venting

This needs to be balanced between night and day temperatures and is essential to avoid disease and pest build up.