



#### Crop Establishment

Clearly crop establishment is fundamental to success in terms of control of yield and size and requires 100% of the grower's attention and skill at sowing and until a full and uniform stand of plants has been achieved. Common mistakes to avoid are as follows:

1. Sowing too deep - although in good conditions carrot seeds will emerge from a depth of 20mm they are much happier at 10-15mm. If you need convincing just look at the establishment of spillages of seeds sprinkled on the soil surface at the end of the beds.
2. Sowing too dry - if the beds are too dry and you cannot wait for rain then irrigate the beds before seeding. Do not sow at 50mm deep trying to get into moisture.
3. Sowing too cold - untreated seed has no protection from damping off fungal pathogens which have a greater impact on slowly emerging seedlings particularly when these are deeply sown and wet conditions prevail.
4. Sowing too wet - carrot seed needs much air in the seedbed. Although the practice of stale bedding allows an advantage in weed control, it does not result in the ideal seedbed which is one that has been freshly prepared.

If beds are prepared rather wet and wet conditions following cause problems with slumping, it is probably better to start again rather than persist with a bad job.

A uniform strike of seedlings is essential for root uniformity at harvest. Seed which is not chitting due to dryness must be irrigated to achieve this. Once it has started it will continue to develop and emerge successfully.

#### Carrot Fly

This is certainly the worst pest of carrots and parsnips and if control is not attended to will have a very serious impact on the organic sector. Of course the problem is not so much with the fly but with the larvae or maggot which burrows into the root tissue. Losses of 15% have been common in some fields this season and a trace of fly is normally present in 'clean' fields.

The conventional wisdom in organic circles of sowing carrots late in the season to avoid the first generation is hopeless advice for those who need long season supplies and sensible yields. It is not an opportunity that mainstream producers can exploit.

**Crop separation** is a very good tool and we must use this as far as we can to avoid build up of pest. In practice this means sowing no new fields within 1000 metres of last years sites. There are always exceptions - wild host plants can keep a basic population active for many seasons so we cannot categorically say that the pest will never build up to damaging levels if separation is implemented.

Normal practice cultural controls must include **early harvesting** of the outside 5 beds of carrots around each maincrop strawed field in the autumn to reduce the impact of the pest.



In emergencies only - sow a **sacrifice crop** of carrots in part of last years infested field to capture migrating flies. This crop must be destroyed completely before the flies complete their life cycle.

**Insect fences** have been tried on small scales and reasonable success has been achieved. Some experiments have given 80% control which is certainly worthwhile. The challenge is to design and build fences which are effective, durable and easy to construct and affordable. Fences rely on excluding the adult pest by exploiting its weak and low level flight pattern.

The elements of design which should be attended to include:

1. The field chosen should be relatively exposed - we cannot expect good control if the field is surrounded by trees as the adult pest readily roosts in the branches. In exposed fields the flight is low to the ground, just above crop height.
2. Fences should be constructed of insect net. The Wondermesh 24 grade is probably the minimum quality for durability and the preference will be towards the WM 32.
3. The finished height should be around 1.75 metres hence a 2m net width will be optimal.
4. The fence should be designed with an outward facing overhang so that adults who are inclined to crawl up the barrier are trapped by the crease in the overhang.
5. It should be anchored or buried at the base so is probably best sited along the middle of a false bed around the outside of the sown area.
6. It is not known if fencing one two three or all sides of the field is necessary.
7. I would advise against using a sacrifice crop outside the fence in an attempt to capture migrating flies.
8. Fly trapping on the outside and the inside of the fence would give an indication of effectiveness.

**Fly traps** are useful for monitoring the activity of carrot fly adults. If you decide to use traps make sure they are sited only in high risk areas so that you can expect good numbers to be caught as it is very difficult to interpret weekly readings of one or two flies. There are a number of suppliers of traps - please ask if you need details.

Activity forecasts - here is the link to the HDC funded fly forecasts.

[http://www2.warwick.ac.uk/fac/sci/hri2/hdcpestbulletin/carrot\\_parsnip/](http://www2.warwick.ac.uk/fac/sci/hri2/hdcpestbulletin/carrot_parsnip/)

## Predicted carrot fly activity 2006

Weather station	First generation	
	Predicted start of fly emergence (10%)	Predicted start of egg-laying (10%)
Wattisham, Suffolk	24 April	4 May
Coltishall, Norfolk	29 April	7 May
Shawbury, Shropshire	21 April	4 May
Leuchars, Fife	24 April	11 May
Dyce, Grampian	30 April	20 May
Kinloss, Grampian	25 April	5 May



### **Sclerotinia**

Thankfully it is much more unusual to find infections of *Sclerotinia* in organic carrots than in conventional; however this is not always the case. There is now a control which can be used in all crops as part of a rotational treatment to reduce soil infections.

Contans® WG (Belchim) has recently received approval for conventional and organic crops. The active inoculant is a fungal spore of *Coniothyrium minitans*, a specific parasite that attacks the resting state (sclerotia) of both *Sclerotinia sclerotiorum* and *Sclerotinia minor*.

The product is available as a wettable granule and is best applied to separated beds immediately before bed shaping so that it is well incorporated to the bed surface after spraying. It should be sprayed just ahead of the tillage equipment.

As indicated on the label, Contans® WG can be used to protect any *Sclerotinia* susceptible crop. It is important to note that Contans® WG is a soil treatment to reduce and control the sclerotia of *Sclerotinia* in the soil, thereby protecting the crop. The rate of use is 8kg/ha and the normal price is £20 per kg.

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