

# Brook Road Allotment Association Fact Sheet– Carrot Fly

This pest damages the roots of carrots, parsley, celery, celeriac and parsnips. However, attacks can be prevented by taking action early in the season.

## What is carrot fly?

Carrot fly is a common pest of carrot-family crops all over Britain. Carrots are worst hit, but celery, celeriac, parsnips, parsley and some other carrot-family herbs are all attacked by the Larvae, which burrow into the roots. The roots can be destroyed, and sometimes the whole plant is killed. Affected roots are hard to store, as the wounds left by the grubs let in diseases such as bacterial soft rots and parsnip cankers.

## When do attacks develop?

There are two attacks a year. Where last year's crops were infested, the flies overwinter as pupae. The pupae are tiny, yellowish cylinders with dark ends, and their small size and colour make them hard to spot.

The first fly generation emerges from May. They lay eggs near susceptible plants, which hatch into white maggots. These tunnel into the roots and feed there in mid-summer. They in turn pupate and hatch into the second generation.

The second generation then lays their eggs. The Larvae tunnel into these in the autumn, and sometimes continue to feed all winter. However, they will all have pupated by late spring, and will be ready to hatch.

## How do I recognise the adult?

Carrot flies are black, glossy and 5mm Long, with a yellow head. To tell them apart from other flies is really a job for an expert, but you usually only notice them in and around carrot family crops.

## What do affected plants look like?

Carrot plants look stunted and 'rusty'. The leaves develop a reddish tinge and are reduced in size, turning yellow and dying.

In allotments and gardens the plants often die. The carrot fly thrives in these habitats as it prefers sheltering trees, shrubs and hedges. Allotments tend to be full of carrot-family crops, grown close together year after year, so the flies don't have far to go to their host plants.

When you pull the roots up, blackened surface tunnels, often containing maggots, can be found all over the roots. Parsnips are similarly mined by the larvae, especially the 'shoulders' of the root. Young seedlings can be attacked in the Leaf stems, as well as the root. This usually kills the seedlings. Celery stems are mined particularly where the stems grow from a crown at soil Level. Larvae also mine celeriac roots.

Parsley is affected by the Larvae killing the thin tap root. If plants die, Look for mines with Larvae in the crown of the plant.

## Is there anything I could confuse it with?

Distorted and red-tinged carrot foliage is a sign of motley dwarf virus, but the roots are undamaged. It is spread by aphids (greenfly).

## What early warning signs should I Look out for?

Sadly, the first sign you will see is when the plant dies or you pull up an infested, damaged root. Commercial growers use a trap to detect the insects, so they can time their sprays for maximum effectiveness, but these are not available to amateurs. Since the pest is damaging every year, it is worth taking preventative action before you see any sign of attack.

## Can affected plants be saved?

Once the Larvae are inside the roots, nothing can control them. Dig up the affected roots to prevent the larvae pupating. Damaged roots can be eaten, but will tend to rot in storage.

## Can I re-sow in affected sites?

Re-sowing where there are still pupae from a previous crop guarantees a severe problem. However, where an early crop has to be scrapped before the larvae have pupated, it may be safe.

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## Can carrot fly be avoided?

Sowing thinly and removing any thinnings immediately reduces the amount of infestation. Very early sowing in frames, cloches or under fleece in November or February will let the carrots reach a good size by the time the carrot fly is on the wing and these early sowings usually avoid serious damage.

Alternatively, sowing later, after the first generation is over, can also avoid damage. Sown in June, 'Bangor' will grow fast enough to be usable by autumn. The second generation of flies can still damage, so early lifting or covering with fleece from September onwards is advisable.

## What preventative measures can I take?

Barriers of insect-proof mesh can exclude the adult flies, if the edges are buried at least 5cm deep. The material can either be laid over the plants or supported on wire or plastic hoops. Fleece does the same job, but it can get very hot under fleece, so insect-proof mesh is a safer option than fleece for summer coverings.

Put the covering on after the crop has been sown and leave it there until at least the end of June. For total protection leave it over the plants for the entire life of the crop. Parsnips, celery and celeriac seem to be less

affected by the second carrot-fly generation, so it may be safer to leave these uncovered rather than to uncover carrots.

Putting up a barrier 75cm high of polythene, fleece or insect-proof mesh around the plot planted with carrots can also exclude the carrot fly. This is because they are weak fliers. Although they can make it over the barrier, they cannot land on to a crop within about 1 .8m of the top. Make these 'fenced' enclosures less than this distance wide or long. Barriers like this work best in open sites, as carrot flies descending from hedges or trees can glide in over the barriers.

## Will crop rotation help?

You should always try to leave a break of at least three years between carrot-family crops in the same piece of ground, as there are soil-borne diseases such as black rot that can be controlled by crop rotation. However, although carrot fly are weak fliers, they seem able to detect and fly to susceptible crops from several miles away, so rotation will not help control them.

## Can companion planting be effective?

Inter-planting onions and carrots - six rows of onions to one of carrots is sometimes recommended - is said to confuse the carrot fly by masking the scent of carrots with the scent of onions. The evidence is not

yet conclusive. Some herbs such as rosemary are said to have the same effect.

## What about resistant varieties?

There's a lot of variation in carrot-fly resistance from one variety to another. In trials, 'Fly Away' was outstanding, though it's expensive. 'Parano' and 'Sytan' also have above-average resistance. However, their resistance may need to be supplemented by insecticide or barriers if you want to get perfect carrots.

## Are there any effective chemicals?

There are no insecticides available to gardeners to control this pest.

## What should I do with affected roots?

If the roots are big enough, lift them as quickly as possible, cutting out damaged areas.

## How can I reduce risk to next year's crop?

Destroy or bin infected roots before the spring to reduce the number of carrot flies next year. Do not leave them in the ground. Digging over the ground in winter rather than in spring may increase natural wastage of pupae through the effects of weather and natural enemies.