Plants and Seeds Information

Meloidogyne chitwoodi & Meloidogyne fallax

The Columbia root-knot nematode

Galls with adventitious root proliferation on carrot
(Courtesy of Netherlands Plant Protection Service)

Why are they important?

The Columbia root-knot nematode, *Meloidogyne chitwoodi* is a major pest of potatoes in the USA and in continental Europe where it has also attacked a wide range of crops such as sugar beet and carrot, as well as black salsify, cereals, grasses, maize, lettuce, pea, *Phaseolus* bean, lucerne and tomato. A related species, *Meloidogyne fallax*, is also an important pest of potatoes, but is much less common. Although both species are notifiable under the Plant Health Order 1993 (as amended), they have not yet been recorded in the UK.

These pests are likely to cause major economic damage in the UK should they become established. Both species readily infest potato tubers, carrot and parsnip. Their economic importance lies in their activity at lower temperatures than native root-knot species, resulting in a more pronounced effect on quality.

What are they are where can they be found?

Like other root-knot nematode species, these pests are barely visible, being less than 1 mm long. Identification to species is only possible using high-powered microscopes, biochemical or molecular tests. Juvenile and male root-knot nematodes are worm-like and transparent; females are pear-shaped and whitish when mature. In the spring, juveniles hatch from eggs in the soil or attached to infested roots. They then enter the roots of their host plants, where they feed and mature within the cortex. Females remain in the root tissue, usually near the root surface, and become surrounded by a gelatinous mass of eggs. These eggs hatch and the resulting juveniles enter uninfested parts of the root system or developing potato tubers that have not yet formed skins.

Brown spots in potato tuber cortex; each spot is a mature female with eggs

Development from egg to adult takes 3-4 weeks, so during the growing season up to three generations can occur under favourable conditions. The nematodes overwinter as eggs, or occasionally as juveniles, in infested roots, tubers or soil.

What are the visible signs of damage?

Symptoms rarely occur above ground, and are rarely produced on the roots of most host crops. However, tubers and tap roots show varying degrees of galling and distortion. On potato tubers, galls may or may not be produced on the tuber surface, depending on the cultivar. When galls are produced, they appear as small, raised lumps above the developing nematodes, giving the skin a rough appearance. Galls may be grouped in a single area or scattered near the tuber eyes. Infestations are difficult to detect in freshly harvested potato tubers, but after a few months the egg sacs turn from translucent to brown and can be seen as brown spots in the cortex of cut tubers. Galls on carrot appear as warty outgrowths, which may develop roots. Damage to the carrot tip may cause divergent growth, known as

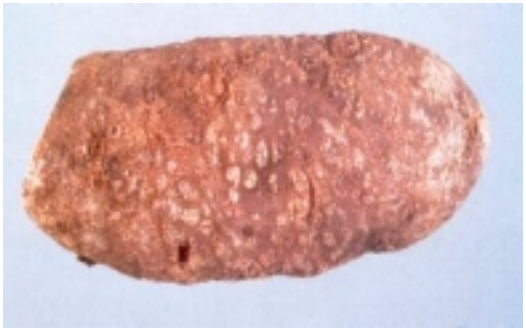
'fanging', though such symptoms may also be indicative of damage by other species of nematodes, or other causes such as disease.

How are they spread?

These species of nematode are mainly spread in potato tubers and associated soil. Spread within fields occurs during cultivation and in water, during through irrigation or natural drainage.

What should I do?

- Seek assurance from your supplier(s) that tubers or root vegetables are free from these pests as part of any commercial contract.
- Send samples with suspect symptoms to the Central Science Laboratory for testing.



This is a notifiable pest.

If you suspect it is present on your crops you must immediately inform your local DEFRA Plant Health and Seeds Inspector or the PHSI HQ, York (Tel: 01904 455174, Fax: 01904 455197. Email:planthealth.info@defra.gsi.gov.uk).

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