

Stem Nematode on Narcissus and Tulip

What it is and where is it found?

Stem nematode, *Ditylenchus dipsaci*, is one of the most serious plant-parasitic nematodes of temperate regions, including Europe and the Mediterranean area. The pest is becoming more common in the UK, with a significant increase in the number of outbreaks reported in recent years.

Stem nematode is a tiny thread-like, transparent and barely visible worm-like pest, which is less than 1.3 mm long. A mass of dormant nematodes may be seen as a glistening off-white 'wool' on, or under, the surface layers of infested bulbs. These may dry to a buff colour and remain inactive for up to 10 years, becoming active again when moistened. This dormant stage greatly increases the ability of the nematodes to survive adverse conditions. Stem nematode can only be properly identified by laboratory examination.

Stem lesions, necking and green petals on tulip



How does it develop and spread?

The whole life cycle occurs within the bulb, corm or leaves. Each female lays up to 500 eggs. Development from egg to adult can take just three weeks at flower-forcing temperatures. The nematodes can survive in fragments of bulb, or return to the soil where they may infest other plants. They can live in moist soils in the absence of host plants for about a year.

It mainly attacks narcissus and tulip, although other bulbs and corms may also be affected including *Camassia*, *Chionodoxa*, *Crocus*, *Galanthus* (snowdrop), *Galtonia*, *Hyacinthus*, *Ismene*, *Muscari*, *Ornithogalum*, *Puschkinia* and *Scilla*. Onion, broad bean, Phaseolus bean, pea, strawberry and many common weeds are also attacked.



Close up of *Ditylenchus dipsaci* (Stem Nematode) 'wool' on a Narcissus bulb

How is it introduced?

Stem nematodes are spread mainly in bulbs. They can also be spread in bulb fragments and leaf debris, which contaminate machinery or are blown by the wind. Wind-blown contamination is a particular problem when tops are 'flailed-off'. Spread within fields also occurs during cultivation and by the movement of surface water. If there is a period when water stands in a field, the infestation may go along rows of plants if a furrow fills with water. Healthy bulbs may become infested by nematodes already present in the soil or from nearby infested weeds.

What damage do they cause?

In general, stem nematodes cause swellings and distortion of leaves and stems, and necrosis or rotting of stem bases, bulbs, tubers and rhizomes.

On narcissus

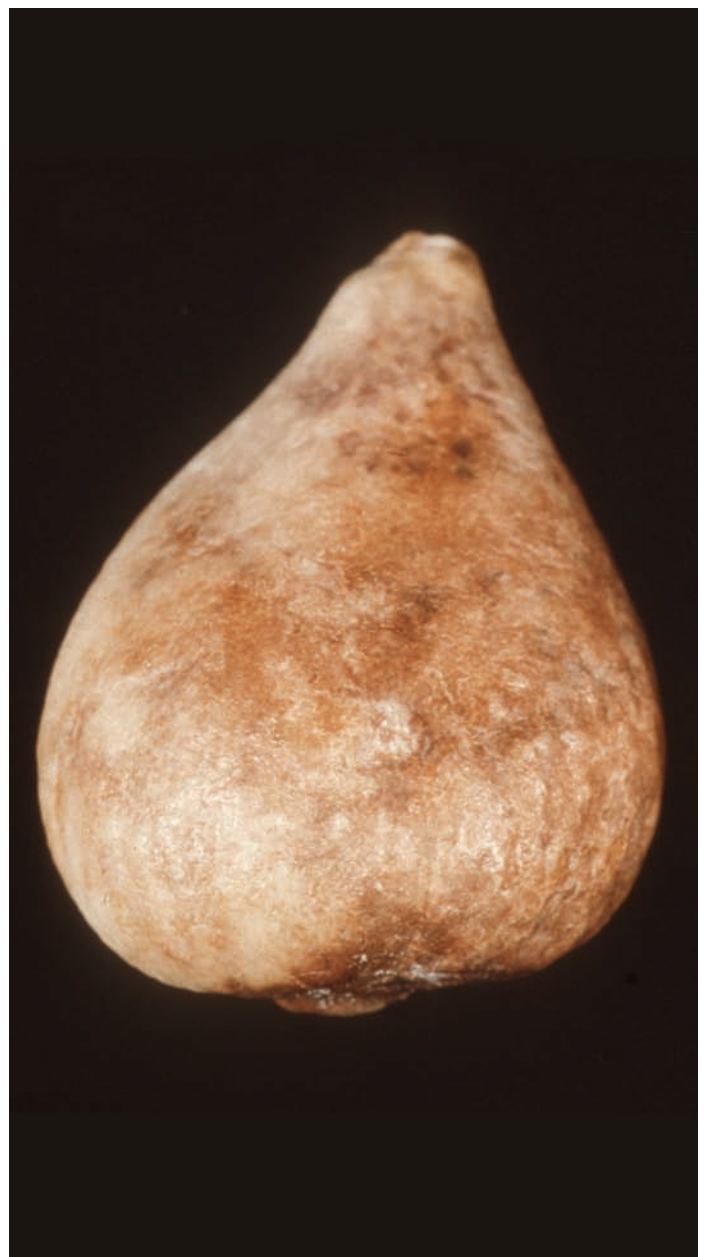
Plants

Small pale, yellowish swellings called “spickels” often develop on the underside of leaves. These are more prominent before flowering and can easily be felt when the leaf is run between finger and thumb.

- In severe attacks, spickels are often large with areas of brown, dead tissue on the centre of the swelling. The spickels can join up and the entire leaf becomes distorted and discoloured.
- Spickels are not always produced, however, and stunted or distorted plants, gaps and late-flowering patches in fields may all indicate stem nematode attack. Flower stems are similarly affected.



Internal necrosis of narcissus bulb



Shiny brown or silvery patches on tulip bulb

Bulbs

Infested bulbs often flower late and infested patches are easily seen later in the season. Inspections of crops are best undertaken after flowering but before leaf senescence.

- Initial signs of infestation in bulbs are glistening, spongy areas within the scale leaves.
- These develop into orange-brown to greyish-brown regions, which appear as rings when the bulb is cut across. When the bulb is cut lengthways, this necrosis appears to be spreading downwards from the neck.

In store, the skin of affected bulbs may appear duller than that of healthy bulbs.



Ditylenchus dipsaci (Stem Nematode) 'Wool' on a Narcissus bulb

On tulip

Plants

Damage to tulip is most conspicuous just before flowering.

- White or purplish streaks increase in size as the flower develops on one side of the stem, just below the flower.
- These blister and split with the damage spreading downwards and sometimes upwards on to the petals.
- The flower bends over towards the damaged side and the outer petals often fail to develop colour. In severe attacks, the petals may be severely malformed.

Other signs of attack are streaks or lesions on leaves and stems and stunting and distortion of growing plants. Crops should be inspected before de-heading.



Spickels on narcissus leaves

Bulbs

Slightly infested bulbs show little or no sign of damage on lifting, even when cut across. However, the damage quickly develops in store.

- Grey or shiny brown soft spongy patches appear on the outer scale and merge indistinctly into the healthy tissue.
- If cut across, the bulbs may show a patchy grey or brown discoloration.
- When cut lengthways, this discoloration appears to be spreading from the base of the bulb.

Severely infested bulbs rot and die.

Keep a good look out

- Narcissus bulbs should preferably have been sourced from a certified crop and must be accompanied by a plant passport. This requires the bulbs to be free from stem nematode. There is no certification scheme for tulips at present but they must have a plant passport. All plant passported stocks are inspected in the growing season by Defra PHSI.
- Crops susceptible to attack by stem nematode should only be grown in the same field every 4 years. Groundkeeper bulbs should be destroyed.
- Regularly clean and disinfect machinery used during bulb production. Bulb waste from grading should not be returned to agricultural land.
- Growing crops should be inspected regularly for signs of stem nematode damage. Suspect and adjacent bulbs should be rogued out and destroyed. As nematodes can move up to 1 metre in a season, destroy bulbs within a 1 metre radius.
- All narcissus stocks should be hot-water treated; standard treatment is three hours at 44.4°C. Some tulip cultivars can be successfully hot-water treated, but others are susceptible to damage.

If you are a registered grower and suspect the presence of this pest on or near your holding, you should 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

Web: www.defra.gov.uk/planth/ph.htm