

Stem nematode in oats

STEM nematode can cause large yield losses in oat crops. But, it has been kept under control by use of resistant varieties grown in rotation with non-host crops. A recent outbreak in South Australia of stem nematode was discovered in a Brusher oat crop causing areas of poor emergence and severely stunting growth in adjoining areas.

Until recently stem nematode has not been observed in commercial oat crops for around 20 years and the two previous crops were Mulgara and Tungoo oats, both of which are classified as resistant to stem nematode.

Research into the outbreak

This project will undertake several lines of investigation to determine if the recent outbreak is due to a resistance breaking biotype, by value adding existing projects funded by Grains Research & Development Corporation (GRDC) and Australian Exporters Company (AEXCO). Research includes:

- Determining the extent of spread of stem nematode in the infested paddock and establish the level baseline for future investigations.
- Conducting pot trials to:
 1. Review the stem nematode resistance classifications of current varieties; and,
 2. Support an AEXCO project to identify germplasm with resistance to the recent stem nematode infestation to support breeding programs.

The infested paddock will be grid sampled and tested using an existing stem nematode DNA test; stem nematode population will be sampled to produce inoculum for the pot trials.

The GRDC National Variety Trial stem nematode project will be scaled up to compare the multiplication of the new population to the one known to occur at Kingsford for more than 20 years on current grain and hay varieties. The results will be used to revise resistance classifications where appropriate.

Stem nematodes from the new infestation will also be used to screen germplasm experiment funded by AEXCO to identify potentially useful sources of resistance to support development of new varieties.



Stem nematode infection preventing emergence of the oat seedling.

Objectives

This project will:

- Determine if a recent outbreak of stem nematode is due to a resistance breaking biotype and if appropriate, produce data to revise the stem nematode resistance classifications of current varieties.
- Map distribution within the infested paddock.
- Develop recommendations on whether further work is required to manage the risk.

Expected outcomes and implications

We hypothesise that a recent outbreak of stem nematode may be due to a new resistance breaking biotype that multiplied on either or both two previous stem nematode resistant oat crops. We expect:

- Results from pot experiments will determine if the stem nematode outbreak is a new resistance breaking biotype or simply a new outbreak of the existing stem nematode biotype.
- Data produced to support a revision of stem nematode resistance classifications, where appropriate.

If the recent stem nematode outbreak is not a resistance breaking biotype, then no additional work is required.

If the outbreak is caused by a resistant breaking biotype, then:
- Stem nematode classifications of all oat varieties will need to be reviewed.
- New sources of resistance may need to be identified and support provided to breeders to develop new resistant varieties.
- Growers may need to reduce the frequency of oat crops in their rotations.

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Source: AgriFutures – Export Fodder.



Patches of poor crop emergence (Brusher oats) caused by stem nematode.