



Fig. 1. Leaf blotch symptoms on ferns (a), *Aphelenchoides fragariae* (b), tight aggregation of strawberry crown with malformed leaves (c); tail with blunt spike (d), heavily infested strawberry plant (left) adjacent to asymptomatic plant. Photo credits L. Forsberg (a) and W. O'Neill (b, c, d, e).

Common Name: Bud and Leaf Nematode

Classification: K: Animalia, P: Nematoda, C: Secernentea, O: Tylenchida, F: Aphelenchoididae

Aphelenchoides fragariae is a foliar nematode which has an extensive host range and is widely distributed through the tropical and temperate zones around the world. It is a frequently encountered and economically damaging pest in the foliage plant and nursery industries. As its name suggests, *A. fragariae* is also a major pest of strawberries worldwide. It has recently been detected in Australian strawberry crops, causing some major losses, whereas historically *A. besseyi* has caused problems in the Australian industry. This nematode should not be confused with *A. ritzemabosi*, another bud and leaf nematode that occurs mainly in chrysanthemum, or *A. besseyi* which causes "crimp disease" in strawberries.

Lifecycle: *A. fragariae* is an obligate parasite of above ground parts of plants. On strawberries, the nematode is ectoparasitic living in the folded crown and runner buds of the plant, with feeding taking place in the folded bud stage. *A. fragariae* is a bisexual species in which the lifecycle can be completed in 10-11 days at 18 °C. The nematode cannot survive in the soil for more than 3 months, but can survive and even multiply in plant tissue at -2 °C. On ferns and ornamentals the nematode is endoparasitic, entering the leaves through stomata when the surface is covered in a thin film of water.

Host Range: *A. fragariae* can attack more than 250 plant species in 47 families from both tropical and temperate zones worldwide. It is a major pathogen of strawberries with most other hosts belonging to the Liliaceae, Primulaceae and Ranunculaceae families which include many flowering ornamentals including begonia, lilies, violets, primula and azaleas. It also commonly affects a wide range of fern species as well as figs.

Symptoms and Impact: On strawberries, abnormal plant growth with stunting and deformation of buds, leaves and flowers is the first symptom. The malformations include twisting and puckering of leaves, undersized leaves with crinkled edges, tight aggregation of crowns, reddened and stunted petioles and flower stalks with aborted or partly aborted flowers. *A. fragariae* can severely impact the yield of this high value crop, as heavily infested plants do not produce fruit.

On ferns, typical leaf blotch occurs in chevron-like stripes, as movement seems to be delimited by veins. Leaf blotch symptoms on flowering plants appear as water soaked patches which later turn brown. *A. fragariae* can become a serious pathogen in nursery grown plants where environmental conditions such as warm temperatures and high humidity favour a rapid build up of the population.

Identification: *A. fragariae* is a long slender nematode up to 0.8 mm long with fast whip-like movement. The spear is slender, approx 10µm long with minute, but distinct basal bulbs. Typical of the genus, it has an obvious large, squarish median bulb. Females and males are both abundant with the female vulva at 64-71% while the male has a "rose thorn" spicule. The tails of both females and males is elongate-conoid ending in a simple blunt spike.

Management and Control: Foliar nematode diseases can be minimized with good cultural practices. Growers should maintain strict sanitation and inspection of plant material to minimize losses. This includes the constant removal and destruction of infected plants and the use of nematode free planting material for propagation. Excessive humidity and splashing of water on stems and leaves and contact between plants should be avoided. Hot water treatments to ensure clean planting material have long been recommended. An emergency use permit for the application of liquid Nematicur® into the crown of strawberry plants has been granted for use at strawberry runner farms in QLD. This is not an option for fruit growers as a 6 week withholding period is required.

Further Reading:

Siddiqi, M. R. (1975) *Aphelenchoides fragariae*. *CIH Descriptions of Plant-parasitic Nematodes Set 5, No. 7.*

McCuiston, J. L. et al. (2007) Conventional and PCR Detection of *Aphelenchoides fragariae* in Diverse Ornamental Host Plant Species *Journal of Nematology* 39(4):343-355.

J. A. Cobon, W. T. O'Neill, D. Hutton and A. Gomez (2011) *Aphelenchoides fragariae* - a foliar nematode on strawberries in south east Queensland. *Proceedings of 18th APPS Conference, Darwin, Australia*, p 105

Key Contacts:

Jennifer Cobon, Agri-Science QLD, Ph 07 3255 4342, Jennifer.Cobon@deedi.qld.gov.au

Wayne O'Neill, Agri-Science QLD, Ph 07 3255 4351, Wayne.O'Neill@deedi.qld.gov.au