Soil pests

What are symphylans?

There have been reports of symphlans in early established crops. Symphla are a natural part of healthy soil biota, & can be found under healthy crops however at very high numbers may cause root damage. Seedlings particularly at risk are those with low vigour due to other stresses such as poor planting conditions. Effected plants may appear stunted & wilt due to early water stress.

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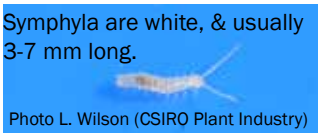
What is a symphyla?

Symphylans (also known as symphilids) are white, soft-bodied & 'centipede-like, usually 3-7 mm long with 12 pairs of legs & a pair of antennae. They can be found by pulling apart clods of dirt, & watching them quickly scurry by.

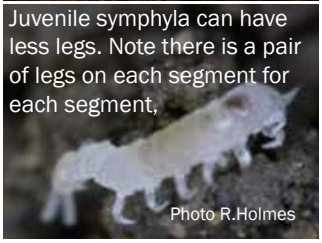


Symphyla are white, & usually 3-7 mm long.

Photo L. Wilson (CSIRO Plant Industry)

Adult symphyla have 12 pairs of legs.

Photo A.Quade (QDAFF)



Juvenile symphyla can have less legs. Note there is a pair of legs on each segment for each segment,

Photo R.Holmes

Symphylans are decomposers & are a natural part of healthy soil biota. Symphylans are not able to burrow, but instead use the cracks to move around. As a result they favour moist, well structured soils rich with organic matter. They can't move through significant compaction, which may 'fence' populations into an area.

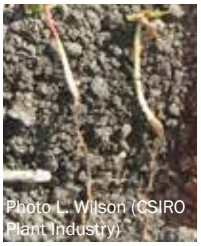


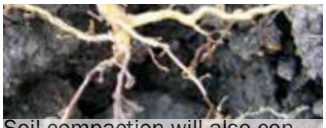
Photo L. Wilson (CSIRO Plant Industry)

Are they causing crop damage?

Unfortunately there is limited knowledge about symphylans in cotton cropping systems. As symphyla are a natural part of a healthy soil biota, finding symphlans in the soil does not necessarily mean that they are causing crop damage. Typically the symphylans survive on organic matter in the soil, but will eat out the soft root tips, & it is thought that where numbers are low, & crop vigour is rapid, that this feeding is unlikely to significantly damage the crop.

Dave Murray (ex QDAFF) has previously observed symphylans in pineapples & demonstarated their ability to severly curtail root growth on newly planted pineapple crowns. Twelve symphylans/pineapple crown for 9 weeks was sufficient to reduce root dry matter by 48% compared to controls.

Dave Murray & Adam Quade (QDAFF) collected samples from cotton near Theodore in 2008 & estimate they were recovering about 50 individuals per shovel full. They were able to replicate the damage in the field, including poor germination and 'witches broom' root symptoms' in glass house conditions with 15 symphlan per plant.



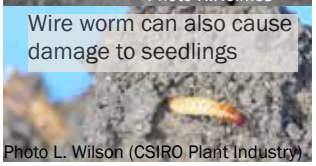
Soil compaction will also contribute to 'witches broom' roots

What else was found?

In addition to symphylans, Lewis Wilson & local consultants have also found collembolla species, such as springtails in the soil. Collembolans are very common in the soil & would not be expected to be causing significant damage to cotton.

Members of Collembola are normally <6 mm long with 6 or fewer abdominal segments.

Photo R.Holmes



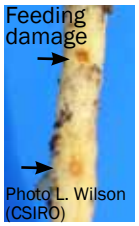
Wire worm can also cause damage to seedlings

Photo L. Wilson (CSIRO Plant Industry)

In addition wireworm, millipedes & small predatory centipedes have also been noted.

Management considerations

In addition to looking for symphylans in the soil, examine the roots of effected plants for evidence of feeding damage.



Feeding damage

Photo L. Wilson (CSIRO)

The use of soil applied chemicals is likely to have limited affect as the developing crop roots quickly push past any applied band & therefore become susceptible. Symphylans can be active in depths exceeding 25cm in well structured soils & therefore a shallow band of soil applied insecticide will provide very limited protection at best.

Once the crop is in the ground, there is little that can be done about soil pests. If roots appear to be damaged, consider modifying water & nutrition management to 'nurse' these plants through. These potential pests will take advantage of slow growing plants, so if a replant is required, plant a more vigorous variety into optimal soil moisture conditions so that seedlings can grow away quickly.

QDAFF plant to conduct research on this pest, in a bid to develop an integrated management strategy which may be beneficial for areas where symphylans have been active & caused disruption to crop establishment on a seasonal basis.

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See also: Cotton Symptoms Guide & Pest & Beneficials Guide

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