Stem and pod rot of groundnut

Athelia rolfsii

**SUMMARY:** Stem and pod rot, also called southern blight, is a fungal disease that occurs wherever groundnuts are grown. It causes up to 10-25% reduction in pod yields worldwide. Losses in Africa are not well recorded but, as it is present in more than 45 countries, they are likely to be high. The fungus is soil-borne, attacking groundnut stems just below soil level and causing leaves to yellow and wilt. As the disease develops, the characteristic thick white cottony fungus grows above ground, and round to oval, 0.5-2 mm, tan to brown sclerotia develop in it. Sclerotia are bundles of fungus with thick protective outer cells, allowing the fungus to survive for months to years in the soil depending on the conditions. The disease can be managed by crop rotation, early removal of affected plants, careful weeding and use of mulch.

**KEY SIGNS**

Stem and pod rot of groundnut is caused by a fungus. It has a very wide host range, attacking over 500 different species, such as legumes, solanaceous crops (tomato, potato, capsicum), cucurbits (pumpkin, squash) and many weeds.

On groundnut, the first sign of the disease is dark-brown spots on the stems just below soil level. The infection causes a yellowing and wilt of a single branch and, after a few days, the wilt of the entire plant. Often at this time the cottony growth of the fungus is obvious on the lower stem and, sometimes, over the soil surface. Groundnut pegs are also infected and the pods rot. During warm wet weather the cottony growth of the fungus spreads from plant to plant.

After about 7 days, the fungal growth begins to form sclerotia. These are 0.5-2 mm diameter tightly packed bundles of the fungus surrounded by a protective rind that is several cells thick. They are white at first and become light brown as they mature. These are the survival structures of the fungus, keeping it alive when there are no more plants to infect.

**MANAGEMENT**

**Prevention** – what to do before signs are seen

*Cultural approaches:* Cultural practices are very important in the management of this disease because of its wide host range, its ability to survive a long time in soil as sclerotia, the limited use of fungicides against soil pathogens\(^1\) and the lack of resistant varieties.

If possible, avoid land with a previous history of this disease. If that is impossible, use a 2-3-year rotation between crops of groundnut on the same land; for example, rotate with maize, sorghum, cassava or yam. Never plant groundnut straight after crops of tomato, capsicum or beans, as the fungus commonly attacks those crops and it may be present in the soil.

\(^1\)Note trials using difenoconazole (a broad-spectrum fungicide) and the fungus Trichoderma harzianum, a natural antagonist of Athelia rolfsii, have shown promise in South Africa.
During growth of the crop, it is important to monitor groundnut at least once a week, looking for plants that are beginning to wilt. If found, remove the plants together with the soil around the roots, taking care not to spread the fungus by dropping soil and/or sclerotia on to other plants.

Add mulch to the soil, such as corn or sorghum straw. Amendments of this kind can be useful, possibly by increasing certain organisms in the soil that compete with the stem and pod rot fungus. Combined with crop rotation this is likely to be a practical method of control for smallholders.

Remove weeds, but take care not to wound the stems to allow entry of the fungus.

After harvest, collect and remove plant debris and burn or bury it deeply. Sclerotia do not survive for more than 45 days if buried 20-30 cm beneath the surface.

**CAUSE**

*Athelia rolfsii* is the sexual state of the fungus, but it is rarely seen, in contrast to the asexual state, known as *Sclerotium rolfsii*. In addition to stem and pod rot, the disease is known as southern blight.

The fungus has a wide host range. Apart from groundnuts, it is common on carrot, beans, cucurbits, capsicum, tomato, sweet potato, soybean, taro and other aroids. Differences between isolates (from cowpea) in growth and sclerotia production have been reported from Benin and South Africa.

The sclerotia survive best when they are near the soil surface in well-drained soil. They can remain alive for several years in soil or in plant debris. As well as sclerotia, the fungus can survive between crops by growing in the remains of plants.

Spread over short distances is by the cottony growth; spread over long distances is by movement of infected plant material and infested soil. The wind can carry soil containing sclerotia.

**IMPACT**

Stem and pod rot of groundnuts is a common disease in many countries. Yield losses of 10-25% are said to be common. Occasionally, losses have been reported at more than 80%.

**DISTRIBUTION**

The fungus *Athelia rolfsii* is reported worldwide in wet and warm countries in the subtropics and tropics. It is especially common in North and South America, Central America and the Caribbean, southern Europe and Asia. The fungus has been recorded in more than 45 countries in Africa.

**FURTHER READING**

