Stem and Pod Rot Disease: A Threat to Groundnut Crop

Poornima[1], Shreevani G. N[2], Sreedevi. S. Chavan[3] and Bharati S.[4]
[134] Scientist, MARS, UAS, Raichur 584104, Karnataka
[2] Scientist KVK, UAS, Raichur 584104, Karnataka
*Corresponding Author: poornimaagri@gmail.com

Groundnut (*Arachis hypogaea* L.) is a leguminous plant that is widely cultivated in the tropics and subtropics between 40°N and 40°S latitudes. It is valued for its high-oil content and edible seeds. It is the fourth most important source of edible oil and a third most important source of vegetable protein in the world. Groundnut is not only an important oilseed crop of India but also an important agricultural export commodity. India ranks first in Groundnut area under cultivation and is the second largest producer in the world with 102 lakh tonnes with productivity of 1831 kg per hectare in 2020-21 (agricoop.nic.in). Groundnut yield is very low in most Asian countries, owing to a number of biotic and abiotic stresses, apart from its cultivation on marginal lands. Moisture stress and frequent droughts, disease and pest attacks, low input use, etc are major production constraints. In addition, low output prices reduce incentives for farmers to invest in productivity enhancing technologies such as improved seeds, fertilizers and pesticides. Groundnut being a rainfed crop, its yield is largely determined by the quantum and temporal distribution of rainfall, in spite of which it performs well under low rainfall conditions if the rainfall is evenly distributed during the growing period.

In India, stem rot of groundnut was first recorded by Butler and Bisby (1931). The wide host range of *S. rolfsii*, its prolific growth and ability to produce persistent sclerotia all contribute to the large economic losses associated with this pathogen (Wokocha, 1990; Cilliers *et al.*, 2003 and Singh *et al.*, 2003).

Symptoms of the disease

The first symptom is yellowing and partial or complete wilting of the stem or one or more branches. In advanced stage of the disease, white mycelial growth at the junction of stem and soil, spreads over the soil and the basal canopy of the plant. The sclerotia of the size and colour of mustard seeds, appear on the infected area as the disease develops. The entire plant may be killed or only two or three branches may be affected. Infected pods were completely covered with white mycelial growth and in severe cases rotting of pod were observed.

Pathogen

Sclerotium rolfsii produces white cottony mycelial growth on potato dextrose medium and the colony morphology was compact or fluffy. Initially, white colored sclerotia were formed. Then their color changed from white to off-white, light brown and dark brown as they attained maturity and they are sub spherical, the surface finely wrinkled, sometimes flattened.

Fig 1: Symptoms of stem and pod rot disease

Integrated Disease Management of Stem and Pod rot disease of groundnut

The treatment deep ploughing + seed treatment with *Trichoderma harzianum* @ 4 g/kg of seed + furrow application of *Trichoderma harzianum* @ 4 kg enriched with 250 kg FYM/ha +

neem cake @ 250 kg/ha was significantly superior over all other treatments (Table 41). The treatment combination recorded highest pooled pod yield (13.64 q/ha) and fodder yield (49.78 q/ha). deep ploughing + seed treatment with *Trichoderma harzianum* @ 4 g/kg of seed + furrow application of *Trichoderma harzianum* @ 4 kg enriched with 250 kg FYM/ha was also effective by recording mean pod yield of 11.28 q/ha and fodder yield of 42.81 q/ha, whereas untreated control recorded very low pod yield (8.20 q/ha) and fodder yield (36.67 q/ha).

Conclusion

Stem and pod rot of groundnut caused by *S. rolfsii* is a potential threat to groundnut production and is of considerable economic significance for groundnut grown under irrigated conditions. the treatment combination deep ploughing + seed treatment with *Trichoderma harzianum* @ 4 g/kg of seed + furrow application of *Trichoderma harzianum* @ 4 kg enriched with 250 kg FYM/ha and other treatment combination that is deep ploughing + seed treatment with Tebuconazole @ 1 g/kg were also effective in controlling the disease, increased pod and fodder yield, yield parameters and benefit cost ratio.

References

Butler, E. J. and Bisbey, G. R., 1931, Fungi in India, Indian Council of Agricultural Research. New Delhi, *Science Monograph*, p. 552.

Cilliers, A. J., Pretorius, Z. A. and Van Wyk, P. S., 2003, Integrated control of *Sclerotium rolfsii* on groundnut in South Africa. *Phytopathol*., 151(5): 249-258.

Singh, A., Mehta, S., Singh, H. B. and Nautiyal, C. S., 2003, Biocontrol of collar rot disease of betelvine (*Piper betle* L.) caused by *Sclerotium rolfsii* by using rhizosphere-competent *Pseudomonas fluorescens* NBRI-N6 and *P-fluorescens* NBRI-N. *Curr. Microbiol.*, 47: 153-158.

Wokocha, C. R., 1990, Integrated control of *Sclerotium rolfsii* infection of tomato in the Nigerian Savanna: effect of *Trichoderma viride* and some fungicides. *Crop Protec.*, 9: 231-234.

* * * * * * * *