Research Paper :

Screening of *Sclerotium rolfsii* Sacc. isolates for tolerance and sensitiveness against commonly used fungicides

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SUMMARY

A study was carried out on tolerance and sensitiveness among 24 isolates of *Sclerotium rolfsii* collected from Latur, Solapur and Nanded districts of Maharashtra state. Twelve fungicides *viz*; benomyl, orthocide, mancozeb, pentachloronitrobenzene (PCNB), tebuconazole, hexaconazole, propiconazole, matalaxyl, thiram, difenoconazole, chlorothalonil, and copper oxychloride were screened against 24 isolates of *S. rolfsii* using poison food technique. Out of 24 isolates, seven isolates *viz.,* SR-03, SR-05, SR-7, SR-10, SR-14, SR-17, and SR-19 showed high levels of tolerance to all these 12 commonly used fungicides. Nine isolates SR-01, SR-02, SR-6, SR-8, SR-11, SR-13, SR-15, SR-18 and SR-24 were weekly tolerant. Remaining eight isolates were highly sensitive to all these fungicides. PCNB, benomyl, orthocide, difenoconazole and chlorothalonil were found to be the most effective in suppressing the growth of most of the tested isolates. The fungicides like thiram, and matalaxyl were the least effective where all the isolates showed tolerance. The isolates of *S. rolfsii* obtained from diseased stem of groundnut crop showed high tolerance to all these fungicides. The isolates, obtained from rhizospheric soil of diseased crop were found to be weekly tolerant and sensitive to these fungicides.

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Stem rot of sunflower cause by *Selerotium rolfsii* occurred 30 to 40 days after sowing. Stems are usually infected at or near the soil line. A brownish lesion develops at the base of the stem and eventually girdles the plant. Later, the entire plant withers and dies. White cottony mycelium and mustard-seed-type sclerotial bodies are conspicuous on the affected stem near soil level. About 10 to 15 per cent plants have been reported to be affected, amounting to 20 per cent loss in yield, if the sunflower crop is planted in July or August or in February or March. The fungal contamination of seeds and grains during storage and the metabolites produced by them are of considerable importance in reducing the seed germination and sprouting (Jain and Patel, 1961). Stem rot diseases cause severe seedling mortality resulting in "patchy" crop stand and ultimately reduce the yields. Management of this disease is very difficult and uneconomical with chemical fungicides alone because of resistance development to chemical fungicides. For the management of this disease, farmers are using different fungicides as seed treatments before sowing but farmers are not getting satisfactory results as the pathogen developed fungicide resistance. Intensification and monocropping of sunflower led to an increase in the incidence of stem rot. Management of this disease is difficult due to prolonged survival ability and wide host range of the pathogen. *S. rolfsii* is a devastating soil-borne plant pathogenic fungus with a wide host-range (Aycock, 1966, Punja, 1988), has prolific growth and ability to produce persistent sclerotia contributing in high degree of economic losses (Mahen *et al*., 1995). The fungus forms differentiated sclerotia and sterile mycelia like other sclerotium-producing fungi. Those characterized by small tan to dark-brown or black spherical sclerotia with internally differentiated rind, cortex, and medulla were placed in the form genus *Sclerotium* (Punja and Rahe, 1992). However, the teleomorphic state was discovered later (Punja, 1988), confirming that the fungus was a basidiomycete. *S. rolfsii* usually causes collar rot (Singh and Pavgi, 1965). Cultivation of resistant varieties is the ideal and feasible management of the disease and resistant sources against this disease had been identified in various countries (Sugha *et al*., 1991; Gurha and Dubey, 1982). Geographical variability among *S. rolfsii* populations was demonstrated by earlier workers (Harlton *et al*., 1995; Nalim *et al*., 1995; Okabe *et al*., 1998). Investigations on