

Basal Wilt of Black Pepper and its Control*

During the 1976 South West monsoon period (June-September), pepper seedlings and rooted cuttings in the nursery were affected by a serious rotting. The fungus associated with this disease was found to be *Sclerotium rolfsii* Sacc. In August 1976, the fungus was observed in a private garden in Nileshtar infecting an yielding vine and causing its death. This disease was subsequently observed in a few black pepper nurseries in North Kerala (Peruvannamuzhi, Chungathara and Panniyur). Chowdhury (1943) had earlier reported that *S. rolfsii* caused basal wilt disease on black pepper in Assam inflicting up to 76% losses.

In the field, infection started at the collar region as water soaked lesions, which spread both ways. The leaves of the infected seedlings became flaccid, turned yellow, and fell off. The soft decay of the collar region caused girdling of the stem and the seedlings succumbed to infection within 2-3 days. The lesion at the base of the stem was covered with white mycelium containing numerous sclerotia. The fungus grew luxuriantly on oat agar medium at room temperature (27-30°C) and formed sclerotium within seven days.

Pathogenicity was established by inoculating the seedlings at the collar region with mycelial mass containing sclerotia. Inoculated seedlings collapsed within five days. Leaves inoculated with the fungus showed water-soaked lesions and decay within 4-5 days under high humidity. The fungus was reisolated from such infected tissues.

Nine fungicides (DCMOD, methoxy ethyl mercuric chloride, DMOC, carbendazim, PCNB, benomyl, streptocycline, aureofungin

Table I. Fungicidal effect on growth of mycelia

Sl. No.	Fungicides*/Antibiotics	Conc ppm	Radial growth of mycelia, mm
1.	Carbendazim	1000	40
		500	42
		250	42
		100	45
		50	45
2.	PCNB	1000	**
		500	15
		250	26
		100	40
		50	42
3.	Benomyl	1000	**
		500	42
		250	45
		100	52
		50	58
4.	Streptocycline	1000	62
		500	68
		250	68
		100	68
		50	69
5.	Aureofungin Sol.	1000	45
		500	45
		250	53
		100	53
		50	53
6.	Agrimycin	1000	60
		500	68
		250	70
		100	75
		50	75

*DCMOD, DMOC, and Methoxy ethyl mercuric chloride completely inhibited radial growth of mycelia, at all concentrations.

**Growth completely inhibited.

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sol, agrimycin) were screened *in vitro* and *in vivo* to find out the most effective chemical against the pathogen. Observations on the radial growth of the fungus on poisoned oats agar were recorded after 4 days (Table I). The action of different concentrations of the chemicals was studied on the sclerotia. For this, 100 mature sclerotia were added to test tubes containing 10 ml each of the chemical. Each day, 10 sclerotia were removed and their germination was recorded on OA medium (Table II). Survival of sclerotia was studied in test tubes containing 30g sterile soil drenched with 10 ml of the chemicals at varying concentrations. From 100 sclerotia buried in each tube, ten sclerotia were recovered each day and germination tested (Table II).

Among the nine chemicals tested *in vitro*, only DCMOD and methoxy ethyl mercuric chloride were effective. Though DCMOD, DMOC, and methoxy ethylmercuric chloride were fungicidal against the mycelium, at concentrations as low as 50 ppm higher doses of DCMOD and the mercurial fungicide were necessary for killing the sclerotia.

Rooted pepper cuttings were planted in polythene bags containing sterile soil. After establishment of the cuttings, chemicals like DCMOD, DMOC, and methoxy ethyl mercuric chloride were added at concentrations of 1000, 500, and 250 ppm. The cuttings were inoculated with mycelial mats containing 20 mature sclerotia each and kept in the glass house (temperature 25-30°C). Ten cuttings were used for each treatment. Two

Table II. Fungicidal effect on survival of sclerotia

Sl. No.	Fungicides	Conc. ppm	Germination of sclerotia steeped in fungicidal solution days							Germination of sclerotia kept in fungicides treated soil days						
			1	2	3	4	5	6	7	1	2	3	4	5	6	7
1.	DCMOD	1000	+	+	—	—	—	—	—	+	+	+	—	—	—	—
		500	+	+	—	—	—	—	—	+	+	+	—	—	—	—
		250	+	+	+	—	—	—	—	+	+	+	—	—	—	—
		100	+	+	+	+	—	—	—	+	+	+	+	—	—	—
		50	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2.	Methoxy ethyl mercuric chloride	1000	+	+	—	—	—	—	—	+	+	+	+	—	—	—
		500	+	+	+	—	—	—	—	+	+	+	—	—	—	—
		250	+	+	+	—	—	—	—	+	+	+	+	+	—	—
		100	+	+	+	+	+	—	—	+	+	+	+	+	—	—
		50	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Note: The other fungicides/antibiotics were not effective
 — Growth/germination inhibited
 + Germination of sclerotia not inhibited

controls were maintained, one without any treatment and another without fungicide, but with mycelium.

DCMOD and methoxy ethyl mercuric chloride were effective in preventing the disease at all concentrations tried.

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