INTERNATIONAL JOURNAL OF PLANT PROTECTION / VOLUME 6 | ISSUE 1 | APRIL, 2013 | 205-206

RESEARCH NOTE

Effect of different levels of inoculum on incidence of foot rot disease of finger millet caused by *Sclerotium rolfsii* sacc

■ V.G. MUNDE[1], M.P. DIWAKAR[2], B. B. THOMBRE[1], UTPAL DEY[1] AND H.N. KAMBLE[1]

[1]Department of Plant Pathology, Marathwada Krishi Vidyapeeth, PARBHANI (M.S.) INDIA
[2]Department of Plant Pathology, College of Agriculture, Dr. B.S.K.K.V., DAPOLI (M.S.) INDIA

ARITCLE INFO

Received : 19.05.2012
Accepted : 20.02.2013

Key Words :
Foot rot,
Sclerotium Rolfsii ,
Nagali, Inoculum level

*Corresponding author:
bthombre@gmail.com

ABSTRACT

An experiment was carried out to find the different levels of inoculums on incidence of foot rot disease of finger millet or nagli at Botany farm, College of Agriculture, Dr. BSKKV, Dapoli. The fungus was studied at four levels of inoculum *i.e.* 1, 10, 50 and 100 sclerotia per pot. At all levels except 100 sclerotia per pot seedling mortality and symptoms was observed within 30th, 20th and 13th days of inoculation, respectively. Only one plant wilted upto 11th days of inoculation in inoculum level of 100 sclerotia per pot. Number of sclerotia produced per pot increased with increase in inoculum levels.

How to view point the article : Munde, V.G., Diwakar, M.P., Thombre, B.B., Dey, Utpal and Kamble, H.N. (2013). Effect of different levels of inoculum on incidence of foot rot disease of finger millet caused by *Sclerotium rolfsii* sacc. *Internat. J. Plant Protec.*, **6**(1) : 205-206.

Finger millet [*Eleusine coracana* (L.) Gaertn] also known as Nagli or Ragi is an important millet crop grown in India. It is a staple food of small or marginal farmers in many hilly regions of the country. In ancient Vedic literature, Nagli or Ragi is mentioned as *ragika*. Though the area occupied by this crop in Konkan region is more, the average yield per hectare is comparatively very low because the crop is vulnerable to diseases. As many as 25 fungal, 4 viral, 5 bacterial and 6 nematode pathogens are recorded on this crop. Among all diseases, so far reported, soil borne diseases of nagli play a vital role in drastic reduction in the yield. Among all diseases the threatening foot rot disease was noticed at Botany farm, College of Agriculture, Dapoli during 2004 -2005 as one of the most destructive disease of the crop as it infects the crop in seedlings stage resulting in complete failure of the crop. The losses reported so far due to foot rot disease caused by *S. rolfsii* vary from 40 to 50 per cent (Basta and Tamang, 1983). This called attention of research workers for immediate study.

A pot trial was carried out in the laboratory for studying the minimum number of sclerotia essential for development of foot rot disease of nagli and to fix the level at which the disease is severe, In all, five treatments were replicated four times. The treatment without fungal inoculum served as control. The numbers of sclerotia inoculated per pot were 1, 10, 50 and 100. The pots were watered daily with sterilized water and were observed for foot rot appearance in the laboratory, using 0 to 4 scale.

Once the fungus was proved to be pathogenic on nagli, it was decided to study the effect of different inoculum levels of *Sclerotium rolfsii* on disease appearance (Table 1). For this, the fungus was inoculated as sclerotia in series *viz*., 1, 10, 50, 100 per pot of sterilized potting mixture. It was observed that the inoculum level of one sclerotium took 25 days for first appearance of the disease whereas in 10, 50 and 100 sclerotia per pot, the symptoms expression was noticed in 11th day after inoculation. In all the inoculation treatments, the disease progressed with advancement in time. The terminal severity on 30th day was 2 in 1 sclerotium per pot whereas it was 4 in 10, 50 and 100 sclerotia per pot in 0 to 4 scale (Table 1). The disease severity at the time initiation of the disease increased with increase in inoculum level. The maximum disease severity *i. e.* 4, was recorded on 20th, 30th and 11th days after inoculation in 10, 50 and 100 sclerotia per pot.

Results of Table 1revealed that the number of days

Table 1: Effect of various levels of inoculum density on disease expression

Inoculum level per potting mixture (no. of sclerotia)	Foot rot incidence expressed in 0 to 4 scale						
	After days of inoculation						
	11	12	13	18	20	25	30
1	0	0	0	0	0	1	2
10	2	3	3	3	4	4	4
50	3	3	4	4	4	4	4
100	4	4	4	4	4	4	4
Control (unioculated)	0	0	0	0	0	0	0

Table 2: Effect of different inoculum levels of *S. rolfsii* Sacc. on sclerotia formation in soil per pot

Inoculum level per potting mixture	Total sclerotia produced per pot in soil after inoculation	Inoculation : Reproduction ratio
1	13.00	1 : 13
10	64.00	1 : 6.4
50	113.75	1 : 2.3
100	191.75	1 : 1.9
Control (uninoculated)	--	--

required for expression of maximum disease severity were 9 and 2 days in 10 and 50 sclerotia per pot. In one sclerotium per pot the maximum disease severity 2 was minimum and that to on 30th day. Whereas it was 4 on 11th day at inoculum level of 100 sclerotia per pot.

Further, the total sclerotia in soil per pot when extracted and counted, it was observed that there was an inverse relation between number of sclerotia inoculated per pot and number of sclerotia extracted per pot. The inoculum : reproduction ratios were 1 : 13, 1 : 6.4, 1 : 2.3, 1 : 1.9 in 1, 10, 50 and 100 sclerotia inoculated per pot, respectively (Table 2).

In present study, *Sclerotium rolfsii* developed foot rot and leaf necrosis on all four plants on 18th day of inoculation at 50 sclerotial levels per seedling per pot. All the four plants inoculated with 100 sclerotia per pot developed symptoms of foot rot and foliar necrosis by 11th day. Hence, 50 and 100 sclerotia per pot were a threshold level range for single nagli seedling. These results are in conformity with Indulkar (1996) who used soil infested with *S. rolfsii* to induce post emergence damping off in groundnut and found that inoculum : soil ratio of 1 : 10 was enough to cause infection and an increase in the amount of inoculum from 1 : 10 was enough to cause infection and an increase in the amount of inoculum from 1 : 10 to 5 : 10 did not make any difference in disease appearance. However, Chakravarty and Bhowmik (1983) reported that soil: inoculum ratio of 50 : 1 (w/w) caused heavy infection due to *S. rolfsii.*

REFERENCES

Batsa, B.K. and Tamang, D.B. (1983). Preliminary report on the study of millet diseases in Nepal. In : maize and fingermillet 10th summer workshop 23-28 Jan. 1983, Rampur (CHITWAN) NEPAL.

Indulkar, A.S. (1966). Studies on *Selerotium rolfsii* Sacc. with special reference to control measures Ph.D. Thesis, the Division of Mycology and Pl. Pathology, I.A.R.I., NEW DELHI (INDIA).

Kumar Chakravarty and Bhowmik, T.P. (1983). Symptoms and techniques of inducing collar rot of sunflower caused by *Selerotium. rolfsii. Indian J. agric. Sci*., **53**(7): 570-573.

****