

## MANAGEMENT OF SORESHIN DISEASE IN FCV TOBACCO NURSERIES OF KARNATAKA

S. RAMAKRISHNAN, S. S. SREENIVAS AND M. M. SHENOI

ICAR-Central Tobacco Research Institute Research Station, Hunsur-571105, Karnataka, India

( Received on 01<sup>st</sup> May, 2020 and accepted on 05<sup>th</sup> June, 2020

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**Flue-Cured Virginia (FCV) tobacco is an important commercial crop grown in Southern transitional zone as rainfed crop. Soreshin caused by *Rhizoctonia solani* Kuhn is an important disease of economic importance as the disease spreads faster and causes severe mortality of transplants. The disease appears in epiphytotic proportions both in conventional and tray nurseries. Effective control measures are of importance both in conventional and tray nurseries to get healthy seedlings for timely planting. Studies were conducted in replicated trials for three years to evolve a suitable fungicidal schedule. Among various fungicides tested, propiconazole 25% EC confirmed to be the best molecule effecting 93.0% control followed by carbendazim 50% WP with 86.9% control of disease. The effective control also resulted in better yield of healthy transplants. The best economical schedule identified from the study is application of propiconazole as foliar sprays @ 0.05% at 25, 35 & 45 DAS in conventional nurseries. To control the disease in tray nurseries, carbendazim @ 0.1% as drench at three intervals is found promising. Both the molecules have an advantage as they effectively control anthracnose and frog eye, the other two important foliar diseases of nurseries in Karnataka. Schedule with propiconazole @ 0.05% spray at 25,35 & 45 DAS gave an ICBR of 1:7.2 in conventional nursery and carbendazim gave an ICBR of 1:6.5 in tray nursery.**

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### INTRODUCTION

Soreshin caused by *Rhizoctonia solani* Kuhn is an important disease in tobacco nursery world-wide. Hitherto unrecorded disease was noticed for the first time in Karnataka Light-Soil (KLS) nurseries during 2005 season. The disease is found spreading in recent years and usually observed at early stage of seedling growth. The first symptom is a small water soaked lesion appears on the stem

close to soil line that rapidly becomes brown and sunken. Under high humidity and temperature the lesions, become very constricted and the stem breaks off at soil line. The fungus is a common soil inhabitant, surviving saprophytically, and as sclerotia. Very sparse information is available on this disease in India with reference to FCV tobacco. Seema *et al.*, (2014) reported that the predominant group of *Rhizoctonia* in KLS is anastomosis group AG 4. Studies were conducted on the management of this disease in Karnataka light soil tobacco nurseries. Management of disease in FCV tobacco was reported by the application of *Trichoderma viride* (Seema *et al.*,2011). However, no chemical management schedule was available to address the epiphytotics of the pathogen in FCV tobacco nurseries in KLS which is an economically destructive disease. In tray nursery the disease spreads more rapidly as sterile tray medium offers a good environment to the fungus for quick multiplication and spread resulting severe mortality. Hence, control measures in tray nursery are very essential on the very onset of the disease.

### MATERIALS AND METHODS

The study was conducted at ICAR-CTRI Research station, Hunsur during 2007-2009 and confirmatory studies subsequently. Replicated experimentation was carried out under natural infection to evaluate effective chemicals for the management of soreshin disease in Flue-Cured Virginia (FCV) tobacco nursery. The fungicides viz., propiconazole 25% EC (0.025-0.10%), thiophanate methyl 70% WP (0.02-0.10%), carbendazim 50% (0.10-0.20%), chlorothalonil 75% WP (0.10-0.20%) and copper hydroxide 77% WP (0.4%) were tested as foliar sprays at 25, 35 &45 DAS. The nursery

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**Key Words:** Soreshin, *Rhizoctonia solani*, FCV Tobacco nursery, carbendazim, propiconazole

was raised by following regular recommended package of practices (Shenoi, 1998). Observations were made on disease incidence at regular intervals and yield of healthy transplants counts was recorded at each pulling. The data from the three years experimentation was pooled and conclusions were drawn. Bulk evaluation of promising schedules was carried out during 2016-17 to work out cost economics in order to develop a farming community recommendation.

## RESULTS AND DISCUSSION

The results indicated that all the chemicals viz., propiconazole, thiophanate methyl, carbendazim, chlorothalonil and copper hydroxide were significantly superior over untreated check for the control of soreshin disease in FCV tobacco nursery even up to 50 DAS. The disease control in

various treatments was in the range of 71.2 to 93.7% and 68.2 to 93.3% at 40 & 50 DAS respectively. The results suggested high efficacy of propiconazole for the control of disease even at 50 DAS. Similar kind of efficacy was reported by Ahmad Ali et al.,(2014) and Madhavi et al., (2018). *In vitro* studies also suggested the high efficacy of the chemical against the pathogen. The chemical exhibited control in the range of 89.2 to 93.7% and 89.4 to 93.3% at 40 and 50 DAS respectively with different doses. The yield of total healthy transplants was in the range of 702 to 767 per sq.m in various treatment schedules as against 492 in untreated control. The best schedule identified was foliar application of propiconazole @ 0.05% at 25, 35 &45DAS which showed 92.2% control at 50DAS and yielded 752 healthy seedlings per sq.m nursery. The molecule has also an advantage, as it effectively controls anthracnose

**Table 1: Chemical control of soreshin disease in FCV tobacco nurseries (Pooled)**

S.N	Treatments	Avg. Germination per 100 cm <sup>2</sup>	% Disease incidence at 40 DAS			% Disease incidence at 50 DAS			Total transplants per sq.m
			1	2	3	1	2	3	
1	Propiconazole @ 0.025%*	18.9	1.2	4.88	89.2	1.9	6.97	89.4	735
2.	Propiconazole @ 0.0.5%	19.0	0.8	4.14	92.8	1.4	5.98	92.2	752
3.	Propiconazole @ 0. 1%	19.3	0.7	4.08	93.7	1.2	6.25	93.3	767
4.	Thiophanate Methyl @ 0.025%	19.3	2.4	7.35	78.4	5.5	12.57	69.3	704
5.	Thiophanate Methyl @ 0.05%	19.0	2.7	6.70	75.7	5.4	10.94	69.8	702
6.	Thiophanate Methyl @ 0.1%	19.1	1.4	5.36	87.4	3.1	9.45	82.7	752
7.	Carbendazim @ 0.1%	19.3	1.0	4.49	90.9	2.6	8.94	85.5	740
8.	Carbendazim @ 0.2%	19.1	1.4	5.85	87.4	2.3	7.99	872	748
9.	Chlorothalonil @ 0.1%	19.3	3.2	8.34	71.2	5.7	12.03	68.2	709
10.	Chlorothalonil @ 0.2%	19.3	1.8	6.78	83.8	3.8	10.72	78.8	738
11.	Copper hydroxide @0.4%	19.5	2.4	7.92	78.4	4.8	11.90	73.2	725
12.	Check (Untreated control)	19.4	11.1	19.19	-	17.9	24.83	-	492
	S.Em	0.64	-	1.14	-	-	1.23	-	22.46
	CD at 5%	NS	-	3.16	-	-	3.42	-	62.25
	Seasons mean	1	19.05	-	7.42	-	9.40	-	573.44
		2	19.29	-	5.38	-	10.30	-	806.63
		3	19.34	-	8.47	-	12.51	-	761.58
	S.Em	0.39	-	1.22	-	-	0.98	-	11.37
	CD at 5%	NS	-	NS	-	-	NS	-	36.36
	CV%	11.52	-	55.62	-	-	39.80	-	10.90
	S x T interaction	S.Em	1.11	-	1.97	-	2.14	-	36.90
		CV%	NS	-	NS	-	NS	-	NS

\*Spray schedule at 25, 35 & 45 DAS; 1= Original mean; 2= Arc Sin transformed values; 3= % control over Check

**Table 2: Cost benefit ratio of promising schedules against Soreshin disease in FCV tobacco nursery**

Inputs/outcome	Conventional nurseryper 100sq.m (Rs/-)			Tray nursery (200 trays)	
	Check	carbendazim 50% WP @ 0.1% at 25, 35 & 45 DAS	propiconazole 25% EC @ 0.05% at 25, 35 & 45 DAS	Check	carbendazim 50% WP @ 3 drenches @ 0.1%
Cost of raising nursery	2500/-	3000/-	3000/-	6500/-	7000/-
Additional cost over check (Rs/-)	-	500/-	500/-	-	500/-
Number of healthy transplants	49250	75250	79200	15325	19200
No. excess transplants over check	-	26000	29950	-	3875
Additional revenue over check (Rs/-)	-	3250/-	3590/-	-	3875/-
ICBR of the schedule	-	1:6.5	1:7.2	-	1:7.8

(@ Rs. 125/- per 1000 transplants from conventional nursery and @ Rs.1/-per tray seedling)

and frog eye diseases, the other two important foliar diseases of nurseries in Karnataka. The next best schedule identified was foliar application of carbendazim @ 0.1% at 25, 35 &45 DAS which showed 85.5% control and yielded 740 healthy seedlings per sq.m. The above schedules were evaluated in a bulk nursery to work out cost economics of the schedule and to develop an effective schedule for both tray and conventional nurseries to manage soreshin disease in KLS. The schedules involving propiconazole gave 1:7.2 and carbendazim gave 1:6.5 ICBR in controlling the disease in conventional nurseries. In tray nursery carbendazim as spray drenches thrice @ 0.1% gave an ICBR of 1:7.8.

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