Evaluation of botanicals and fungicides on threshed grain mold rating (TGMR) and grain hardness in sorghum

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❖About **50 diseases** are noticed in sorghum, but only 30 of them are found in India.

❖**Grain mold** is the major disease of kharif sorghum affecting grain yield as well as the quality of the produce.

❖Grain mold is caused by a **complex of fungi** and it affects the grain **yield**, **quality** and market **value**

❖One of the most important factors for development of the grain mold in kharif sorghum is the **late rains** of October- November at physiological maturity stage.

❖Grain mold can be broadly defined as pre–physiological **grain deterioration** caused by fungal species interacting pathologically and or saprophytically with developing grains.

❖Discoloration observed at physiological maturity includes **blackish** discoloration by *Curvularia s*p., **pinkish** discoloration by *Fusarium s*p. , snow **whitish** discoloration by *Olpitrichum s*p. and **grayish** discoloration by *Alternaria o*r *Drechslera* sp.

❖The study was undertaken to test the **efficacy of botanicals and fungicides against grain mold fungi** of sorghum.

Material and Methods

❖Study consisted of **eleven different treatments** including control on grain mold susceptible genotype, **AKMS 14 B** of sorghum

❖Study was carried out at Sorghum Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during **kharif 2013.**

❖These **eleven treatments** were

T1 – Neem seed extract 10%,
T2– Neem leaves extract 10% ,
T3 – Eucalyptus leaves extract 10% ,
T4 – Ginger (rhizome) extract 10%,
T5 – Garlic (cloves) extract 10%,
T6 –Pyraclostrobin 0.1% (1 g/lit),
T7– Propiconazole 0.1% + Mancozeb 0.3% (Propiconazole 1 ml/lit + Mencozeb 3 g/lit.),
T8 – Thiram 0.2% + Carbendazim 0.1% (Thiram 2 g/lit + Carbendazim 1 g/lit.),
T9 – Pr-opiconazole 0.1% + Thiram 0.3% (Pr-opiconazole 1 ml/lit + Thiram 3 g/lit),
T10 – Water spray,
T11 – Control (No any spray).

❖**Two sprayings** of the **botanicals** and **fungicides** were taken on sorghum genotype AKMS 14 B of which first spray was taken at complete anthesis stage and second at 15 days after first spray.

❖To invite sufficient fungal load, **regular water sprays** were done.

❖The observations were recorded on Threshed grain mold rating (**TGMR**) % and **grain hardness** (kg/cm^2)

Results and Discussion

Table 1. Effect of botanicals and fungicides on Threshed grain mold rating (TGMR) in sorghum genotype AKMS 14B

Sr. No.	Treatments	Conc. %	TGMR (%)
T_1	Neem Seed Extract	10%	28.80 (32.36)
T_2	Neem Leaves Extract	10%	49.60 (44.77)
T_3	Eucalyptus Leaves Extract	10%	42.30 (40.54)
T_4	Ginger (rhizome) Extract	10%	**28.20 (32.00)**
T_5	Garlic (cloves) Extract	10%	**26.90 (31.22)**
T_6	Pyraclostrobin 20% WG	0.1%	**8.10 (16.47)**
T_7	Propiconazole 25% EC + Mancozeb 75% WP (1:3)	0.1%+0.3%	**9.30 (17.67)**
T_8	Thiram 75% WP+ Carbendazim 50% WP (2:1)	0.2%+ 0.1%	12.67 (20.81)
T_9	Propiconazole 25% EC + Thiram 75% WP (1:3)	0.1%+ 0.3%	11.85 (20.13)
T_{10}	Water spray.	-	**54.90 (47.82)**
T_{11}	Control.	-	50.40 (45.23)
	F test	-	Sig.
	SE(m) ±	-	1.63
	CD(p=0.05)	-	4.81

Figures in parenthesis are arc sine values

Table 2. Effect of botanicals and fungicides on Grain Hardness in sorghum genotype AKMS 14B

Sr. No.	Treatments	Conc. %	Grain hardness (kg/cm^2)
T_1	Neem Seed Extract	10%	6.50
T_2	Neem Leaves Extract	10%	6.05
T_3	Eucalyptus Leaves Extract	10%	6.17
T_4	Ginger (rhizome) Extract	10%	6.65
T_5	Garlic (cloves) Extract	10%	6.67
T_6	Pyraclostrobin 20% WG	0.1%	8.12
T_7	Propiconazole 25% EC+ Mancozeb 75% WP (1:3)	0.1%+0.3%	8.27
T_8	Thiram 75% WP+ Carbendazim 50% WP (2:1)	0.2%+ 0.1%	7.38
T_9	Propiconazole 25% EC + Thiram 75% WP (1:3)	0.1%+ 0.3%	7.61
T_{10}	Water spray	-	5.97
T_{11}	Control.	-	5.40
	F test	-	Sig.
	S.E.(m)±	-	0.24
	C.D.at 5%	-	0.72

Conclusions

❖ Among the **fungicides**, the Threshed grain mold rating **(TGMR)** was minimum in the treatment **of Pyraclostrobin @ 0.1% (8.10%),** followed by **Propiconazole @ 0.1% + Mancozeb @ 0.3% (9.30%).**

❖ Among the **botanicals** lowest Threshed grain mold rating **(TGMR)** was found in the treatment **Garlic extract @ 10% (26.90%)** followed by **Ginger extract @ 10% (28.20%)** while maximum found in water spray treatment (54.90%) and in control (50.40%).

❖ **Maximum grain hardness** (8.27 Kg/cm^2) was recorded in the **treatment Propiconazole @ 0.1% + Mancozeb @ 0.3%** followed by **Pyraclostrobin @ 0.1%** (8.12 Kg/cm^2).

❖ Among the **botanicals**, **Garlic extract @ 10% (**6.67 Kg/cm^2) was the best treatment. Minimum grain hardness was recorded in control treatment (5.40 Kg/cm^2) and (5.97 Kg/cm^2) in water spray treatment.

❖ Thus it was concluded from the study that the treatment **Pyraclostrobin @ 0.1%** and **Propiconazole @ 0.1% + Mancozeb @ 0.3%** were the best in controlling the **TGMR** and improving the **grain hardness** in sorghum. While in case of **botanicals**, **Garlic extract @ 10%** was best in reducing the TGMR and improving the grain hardness.

Thank You