

RESEARCH ARTICLE

# Association of seed mycoflora infection in assessment of new source of resistance against grain mould of sorghum

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## ABSTRACT

The frequency of association of different seed borne infections of sorghum hybrids and their parents was assessed during *Kharif* 2011 at MARS, UAS, Dharwad. The study examined the frequency of the two most common grain mould fungi, *Fusarium* and *Curvularia*. The germination percentage varied from 13.45 per cent (296 B) to 80.21 per cent (B 58586). The newly developed hybrid DNB 4 x GMRP 950-285 had higher germination percentage of 78.59 and lower *Fusarium* infection per cent of 11.45 which was on par with highly grain mold resistant check B 58586 (80.21 per cent germination and 9.78 per cent seed infection with *Fusarium*). The association of *Fusarium* infection in crosses was higher when compared to *Curvularia* infection. There were highly significant negative correlations between germination and *Fusarium* species ( $r = -0.84$ ). Germination was reduced upto 25-30 per cent in sorghum genotypes due to infection of grain mould species. Thus, the study identified a new hybrid with lesser frequency of *Fusarium* and *Curvularia* causing grain mould in Karnataka.

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## INTRODUCTION

Grain mould, caused by a complex of pathogenic and saprophytic fungi species like *Curvularia*, *Fusarium*, *Alternaria*, *Phoma soghina* and *Helminthosporium* and is a highly destructive disease of *Kharif* sorghum around the globe which take heavy toll every year. Most of these fungi are unspecialized or facultative parasites, and the predominant species vary depending on location, year and the environment. Among the fungi involved in the mould complex, species of *Fusarium*, *Curvularia* and *Alternaria* are more abundant than others (Girish *et al.*, 2004). The annual economic loss in Asia and Africa as a result of grain mould is more than US\$130 million (Chandrashekar *et al.*, 2000).

Grain mould reduces grain quality through deterioration of endosperm and reduced embryo viability. Grain infected with mould is also more likely to be contaminated with mycotoxins, and these metabolites can present hazards to consumers (Williams and Rao, 1981). All of these factors result

in reduced grain quality and yield and hence a reduced market value of the crop. Planting photosensitive cultivars that mature during periods of dry weather or resistant cultivars can minimize these yield losses. Though there is significant research finding on genotypic reaction to grain mould in general, there is a little information available on the frequency of mould fungi on seed and their effect on germination in sorghum cultivars under climate change regimes. Kotgire (2009) found that the fungi *viz.*, *F. moniliforme* (38.75%), *Fusarium* sp. (21.50%), *Penicillium* sp. (4.00%), *Aspergillus niger* (3.00%) and *Macrophomina phaseolina* (2.50%) associated in pinkish discolored grains of sorghum. Increased grain mould severity and reduced seed germination in sorghum seed inoculation with *Fusarium thapsinum*, *C. lunata* and a mixture of the two fungi in all sorghum cultivars tested were reported by Prom *et al.* (2003). Narnaware *et al.* (2006) reported that *Fusarium* and *Curvularia* are the two most important fungal genera causing grain discoloration and reduction in viability of seed. Castor (1981) and Garud *et al.* (2000) also