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Management of seed mycoflora of rice by different seed dressing fungicides

SHALINI D. SAGAR* AND YASHODA R. HEGDE
Department of Plant Pathology, University of Agricultural Sciences, Dharwad-580 005 (Karnataka), India

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SUMMARY

Rice seeds may be infected by various fungi causing discoloration. Results indicated that all fungicides were effective in reducing per cent infection compared to the untreated control. Carbendazim @ 0.2% was most effective in reducing the per cent infection (5.33%) and recorded maximum seed germination (91.33%) and vigour index (2746.00). It reduced the infection by 15 per cent, increased seed germination by 80 per cent and seedling vigour by 10 per cent compared to the untreated control. Other fungicides like tricyclazole @ 0.2%, carboxin @ 0.2% and mancozeb @ 0.4% were also found effective in managing the seed mycoflora of rice .

Key words: Seed mycoflora, Fungicides, Percent infection, Germination, Vigour index.

Rice is one of the most important cereal crop. Discoloration results in poor quality of grain and is an important degrading factor.. The most important fungal diseases of seed are blast (*Pyricularia grisea* Cavara), brown spot (*Exserohilum oryzae* (Breda de Hann.), udabatta disease (*Ephelis oryzae* Syd.), grain discoloration by *Fuasrium moniliforme* (J. Sheld) L., *Curvularia lunata* (Wakker) Boedign, *Alternaria* spp., *Aspergillus* spp. and *Rhizospus* spp. (Ou, 1985). Discoloration of paddy grains cause reduction in starch contents to an extent of 2.26 to 20.37 per cent in different categories of discoloration (Misra, 1987). In most cultivars 10.00 per cent loss in thousand grain weight was observed in categories carrying higher degree of infection (Misra and Dharam Vir 1991). Hence an attempt was made to study the effect of seed treatment with different systemic and non-systemic fungicides on seed mycoflora and seedling vigour.

MATERIALS AND METHODS

The seeds of variety Amruth, which was susceptible to grain discoloration were treated with different concentrations (based on commercial formulation) of systemic and non-systemic fungicides (Systemic *viz*., Carbendazim, Carboxin, Triademefon and Tricyclazole, @ 0.05, 0.1, 0.2, Non-systemic *viz.,* Captaf, Copperoxychloride, Iprodione, Mancozeb, Thiram @ 0.2, 0.3, 0.4) by dry seed treatment method. The seeds were shaken with the fungicides in a flask for about 30 minutes and stored for 24 hours. Germination studies were performed by employing rolled towel method of the ISTA (Anon., 1996). Hundred seeds of each treatment were placed equidistant on two wet blotter sheet of 30 cm^2. This was covered with a third blotter sheet. All the three blotter sheets were rolled together and these rolls were incubated under darkness for 14 days at 25±2°C. Each treatment was replicated four times. Seeds without treatment served as control. At the end of incubation, the number of germinated seeds and infection percentage were recorded. Root length and shoot length were measured and vigour index was calculated. Seedling vigour was measured by calculating vigour index. The vigour index was calculated by using the following formula given by Abdul-Baki and Anderson (1973).

$$\text{Vigour index} = \text{Germination percentage} \times \text{Seedling length (Shoot + Root length)}$$

RESULTS AND DISCUSSION

Percent infection:

There was significant reduction in per cent infection in different treatments compared to control. Fungicide treated seeds yielded less per cent infection when compared to untreated control seeds (20%). Among all the fungicides evaluated, carbendazim @ 0.2 per cent was found to be most effective (5.33%) which was on par with carbendazim @ 0.1 per cent (5.66%). Other effective fungicides were tricyclazole @ 0.2 per cent, (6.33%), carboxin @ 0.2 per cent (6.33%), iprodione @ 0.4 per cent (7.33%), thiram and mancozeb @ 0.4 per cent (7.66%). However captaf and copper oxychloride were found to be least effective in reducing per cent infection.(Table 1)

Seed germination:

Among all the fungicides tested, carbendazim @ 0.2 per cent recorded maximum germination (91.33%) which was on par with carbendazim @ 0.1 per cent (90.66), and least germination was observed in captaf (80.66%)(Table 1).

Vigour index:

Among the different fungicides, carbendazim @ 0.2 per cent recorded maximum vigour index (2746.0) which was on par with carbendazim @ 0.1 per cent (Table 2).

Similar results were obtained by Dharam Vir *et al.* (1970) who reported that mancozeb gave complete control of seed mycoflora as against 21 per cent infection in untreated seed. They also reported that seeds showed higher germination counts than untreated seeds. Yashawantha Kumar and Prasanna (2001) reported that

*Author for correspondence