Effect of fungicide treatments and containers on pearl millet seed storability

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Key words: Pearl millet, fungicides, containers, seed storability

Pearl millet [*Pennisetum glaucum* (L.) R. Br.], popularly known as bajra, is an important food and fodder crop of semi-arid and arid regions of the Indian sub-continent. Several fungal species have been reported to be associated with bajra seed. Among them seed borne diseases like downy mildew, ergot and smut are serious problems in bajra growing areas resulting in enormous quantitative and qualitative losses (3). In this study longevity of fungicide treated seed of bajra hybrid during storage has been presented.

The processed seed of bajra hybrid HHB-67, produced during *kharif* 1998 was procured from the National Seed Corporation. The seed was dried below 8 per cent moisture content and subjected to treatment with apron @ 6 g/kg, captan @ 2 g/kg and thiram @ 2.5 g/kg seed. About one kg seed in each of the treatments was separately packed in three containers viz. gunny bag (GB), 400 gauge polythene bag (PB) and polylined gunny bag (PLGB). For the control, untreated seed was packed separately in the above three types of containers and stored under ambient conditions in December 1998. Before storage and at bi-trimonthly intervals, the germination percentages were recorded for 30 months as per the ISTA (4).

The germination percentages recorded periodically during storage period are depicted in Figures 1 and 2. The initial germination was more than 90% irrespective of containers and seed treatments. Significant differences were observed among seed treatments and containers over storage periods, prominently during later stage. Higher percentages of seed germination were observed with all the fungicidal treatments than control (Fig. 2) and captan was found the best. All the seed treatments were found effective in maintaining the germination above the certification standards upto 17 months of the storage. However, the treatment with captan and thiram worked well upto 22 months when seed was stored in polythene bag. The seed germination, irrespective
of treatments declined at a faster rate in gunny bag but remained above or around the minimum seed certification standards (75%) up to next sowing season. The treated seed in other containers could safely be stored for two sowing seasons. Similarly it has been reported that the seed treatment with fungicides did not adversely affect the viability and prolong shelf life of various cereal crops viz., wheat, barley, maize, sorghum and bajra (1, 5, 6).

The germination of untreated seed remained above the prescribed certification standard up to eight months when stored in gunny bag as against 14 months when stored in polythene and polylined gunny bag. The seed treated with captan/thiram and stored in gunny bag maintained the minimum seed certification standards up to 12 months as compared to 17 months when stored in polythene and polylined gunny bag containers. The effect of polylined gunny bag was at par with polythene bag in control as well as treated seed (Fig. 2). Among the storage containers, the moisture proof containers namely polythene bag and polylined gunny bag were found superior to gunny bag for storing the bajra seeds with or without seed treatment for 14 months and more (two sowing seasons). Superiority and suitability of moisture proof containers due to its imperviousness for the purpose of successful seed storage were amply demonstrated by Raghvani et al. (6).

Both the seed treatments and containers had pronounced effects on storability of bajra seed. At any given seed treatment, the germination was significantly higher for the seeds stored in polythene bag compared to the corresponding values recorded in the gunny bag. The longevity of seeds further enhanced with the use of non-systemic fungicides like captan and thiram. Application of these fungicides would help in improving seed health and germination (6).

The fact that the seeds treated with fungicides were able to record higher germination in this study bears testimony to the deleterious effect of fungi on viability of seeds during storage. The fungicides also had no adverse or phytotoxic effect on germination. The non-systemic fungicides (captan and thiram) were found to be more effective than systemic fungicide (apron) in contrast to the finding of Ashokan et al. (2) in finger millet. Among the containers used, polythene bag and polylined bag had maintained higher germination and found superior over gunny bag. This may be due to the fact that seeds did not get the shock of seasonal changes.

Seed deterioration is a continuous process and seeds often lose viability during storage. Besides many other environmental and genetic factors, seed borne fungi contribute a lot in this process. Storing the seed with fungicide dressing in moisture impervious containers can minimize this loss to viability. It would be inferred that under Haryana conditions dried pearl millet seed can be carried over for next year's planting in gunny bag and for next two/three sowing seasons in polythene bag or polylined gunny bag, if treated with the captan or thiram. The pre-storage seed treatment helps to improve the health and shelf life of seeds.

REFERENCES

Received for publication February 10, 2003