Range Mgmt. & Agroforestry 26 (2) : 157-159 ISSN 0971-2070

EFFECT OF STORAGE PERIOD AND CONTAINERS ON SEED QUALITY OF RANGE GRASSES

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Storage conditions and period may affect the quality of seeds. The seeds longevity can be enhanced if the seeds are stored for varying period as per need at low temperature, relative humidity and seed moisture content (Roberts, 1972). Moore and Ross (1982) found that loss of germination was higher in pearl millet seeds stored at high temperature and high relative humidity. The physiological quality of seeds after storage must be evaluated otherwise the desired yield will not be attained. *Cenchrus ciliaris, Panicum maximum, Chrysopogon fulvus, Penisetum pedicellatum* are the dominant range grasses grown widely in different regions due to their wide adaptability and biomass productivity. Since not much information is available on seed germination rate and after ripening period of these grasses under different period of storage and containers, the present study was conducted.

The seeds of *C. ciliaris, C. fulvus, and P. maximum* were harvested and collected in the month of October 2000 whereas the seeds of *P. pedicellatum* were harvested in November 2000. After harvesting the seeds were cleaned and stored in polythene bags (700 gauge), plastic jars, steel boxes, gunny bags and earthen pots at the initial moisture content of 8-10%. The initial germination was also recorded in the freshly harvested seeds before storing. The seeds were tested for their germination at three months intervals during 2000-01 and at six months interval during 2001-02 up to September 2002. The germination studies were conducted in the seed germinator at controlled temperature (30°C). The moisture content of seeds was obtained by drying the seeds in electric oven at 130°C for six hours. The percent moisture content was calculated by using the formula:

$$\frac{\text{fresh weight} - \text{dry weight}}{\text{fresh weight}} \times 100$$

No major difference was observed in the moisture content of seeds of various grass species stored in different containers under ambient conditions. Although slight higher moisture percentage was observed in the seeds stored in earthen pots and gunny bags over the long period of storage *i.e.* after 24 months. (Fig.1). Basu *et al.*, (2004) has pointed out that the seeds of maize parental line could be safely stored for 8 months under ambient condition without significant decline in the seed quality.

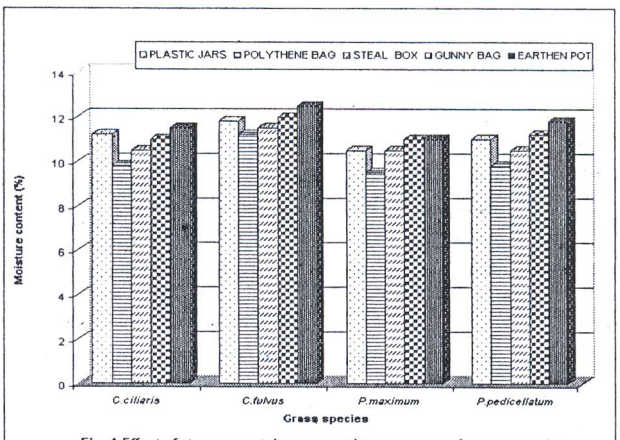

Fig. 1 Effect of storage containers on moisture content of grasses seeds stored for 24 months.

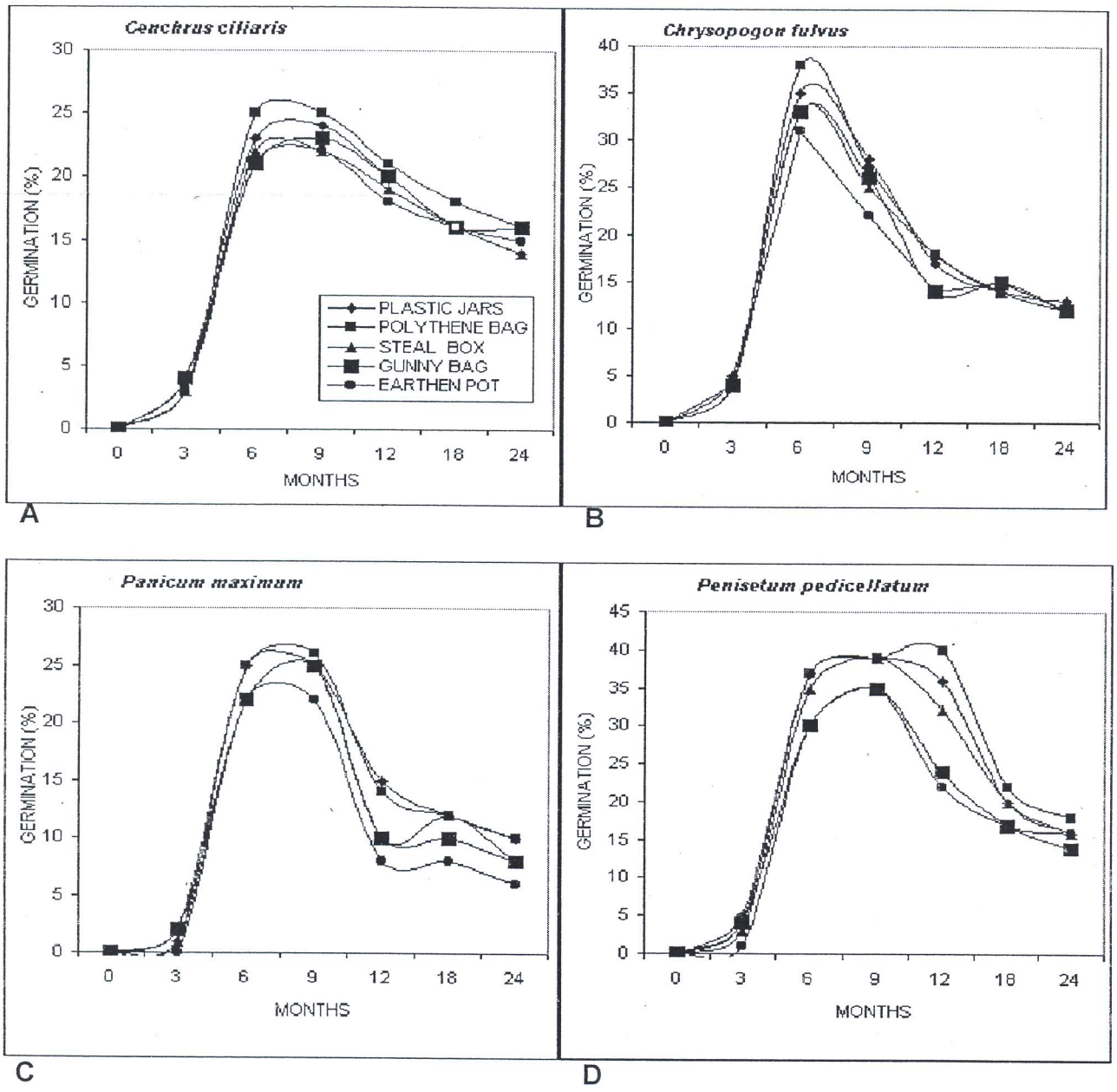

Fig. 2 : (A, B, C, D) Germination *as affected by storage period and storage containes in different grass species*

The freshly harvested mature seeds stored in different containers were tested for germination at the time of storing and no germination was recorded indicating that these seeds require after ripening period. The germination rate increased with increasing storage period and reached maximum at 6 to 9 months of storage in all the containers and then decreased slowly after 12 months but sharply after 18 months of storage. These results revealed that these grasses required minimum 6 months of storage after ripening period for achieving the full potential of germination. Bassi *et al.*, (2003) also reported that germination in six months old seeds was higher than in nine months old seeds. With regards to the effect of containers on seed germination, the maximum seed germination was recorded in the seeds stored in polythene bags (700 gauge) and plastic jar followed by steel boxes, gunny bags and earthen pots (Figure 2 A, B, C & D).

There was 8 to 10% decrease in seed germination after 18 months and 25 to 50% after two years of storing. The results revealed that the seeds of these grass species stored in polythene bags/and poly jars maintained the germination better. Vincent and Thandapani (2003) reported that seed stored in moisture proof containers treated with GA showed lowest seed viability reduction. Azevedo *et al.*, (2003) and Appa Rao *et al.*, (1991) also found that highest vigour was obtained for the seeds conditioned in impermeable packing. Maximum germination percentage was recorded in seeds stored in polythene bags in comparison to clothes and paper bags. (Rampal *et al.*, 2003; Singh and Dadlani, 2003).

Acknowledgement

The authors are thankful to the Director, Indian Grassland & Fodder Research Institute, Jhansi, India and AP Cess fund ICAR, New Delhi, for providing facilities and financial support.

References

Appa Rao, S., N. Kameswara Rao and Melak H. Mengesha. 1991. Germination of pearl millet (*Pennisetum glaucum*) seeds stored under different conditions for six years. *Seed Sci. Technol.* 19 : 605 – 610.

Azevedo, M. R., De. Q. A., J. P. G. De., Gouvela, D. M. De M., Trovao and V. De P. Queiroga, 2003. Influence of packing and storage condition on the vigour of sesame seeds. *Revista Brasileira de Engenharia Agricola e Ambiental.* 7 : 519 – 524.

Basu, S, S. P. Sharma and M. Dadlani. 2004. Storability studies on maize (*Zea mays* L.) parental line seeds under natural and accelerated conditions. *Seed Sci. Techno.* 32 : 239-245.

Bassi Geeta, Sukhchain, J. S. Samra and Malkit Singh. 2003. Determination of optimum period of maturity and period of storage in guinea grass. *Forage Res.* 29 : 82-83.

Moore, F. D. and E. E. Ross, 1982. Determining differences in viability loss rates during seed storage. *Seed Sci. Techno.* 10 : 283 – 300.

Rampal, C. B. Singh, A.A. Khan and A. L. Jatav. 2003. Effect of abiotic and biotic factors on the germination, seedling length and seed vigour index during storage of green gram (*Vigna radiata* L. Wilczek) seeds. *Progressive Agriculture.* 3 : 89 – 91.

Roberts, E. H. 1972. Storage environment and control of viability. In: *Viability of Seeds* (ed. E. H. Roberts), Chapman and Hall Ltd., London, pp14-58.

Singh, K. K. and M. Dadlani. 2003. Effect of packing on vigour and viability of soybean [*Glycine max* (L.) Merrill] seed during ambient storage. *Seed Research.* 31 : 27-32.

Vincent, S. and V. Thandapani. 2003. Effect of storage containers and growth regulators on seed quality and germination of papaya seeds (*Carica papaya* L.) *South Indian Horticulture.* 51 : 116 – 121.