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AN IMPROVED METHOD FOR BREAKING DORMANCY IN SEEDS OF *SESBANIA SESBAN*

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SUMMARY

Dormancy in seeds of *Sesbania sesban* is caused by a water-impermeable seed coat (hard seeds or hardseededness). A two-phase pretreatment technique was developed for breaking seed dormancy and was validated using different accessions and seed lots. Seeds were first soaked in water at 80 °C for 8 min and prepared for the germination test. Ungerminated hard seeds at the first count (after four days incubation) during the germination test were then subjected to a second treatment by mechanically scarifying the seed coat. The effects of water temperature and variation in initial hardseededness and viability among and within accessions were also investigated. The optimum water temperature, allowing maximum seed germination without increasing the percentage of abnormal seedling/dead seeds was 80 °C. The mean percentage of hard seeds across 30 seed lots of six accessions was reduced to 26% after phase 1 and to 0% after phase 2. In addition, full germination occurred within only 10 days for treated seeds while germination in untreated seeds had reached only 48% after 14 days. Significant differences existed among the seed lots within the accessions ($p > 0.05$) for the percentage of initial hard seed and for the effects of treatments on breaking seed dormancy. The two-phase technique developed was validated using over 1000 seed lots of *S. sesban*, and it was found to be a rapid and cost-effective method for breaking hard seed dormancy with potential for wider use for hard-seeded legumes.

INTRODUCTION

Sesbania sesban is an important legume fodder tree with a wide distribution throughout tropical Africa and Asia. It has also been introduced into tropical America (Heering *et al.*, 1996). The tree grows vigorously and provides a lot of high quality biomass in a relatively short period (ILCA, 1988). It can be used for fodder, fuelwood, shade, living fences, improving soil fertility through nitrogen fixation and as a mulch (Chintu *et al.*, 2004; Kusekwa *et al.*, 1993). *Sesbania sesban* is the most widely known species in the genus; a large germplasm collection has been assembled from sub-Saharan Africa, which is currently maintained in the International Livestock Research Institute (ILRI) genebank (Hanson, 1993; Heering *et al.*, 1996).

Research on dormancy and storability of *S. sesban* seeds is limited (Poulsen *et al.*, 1998). It has been reported that the seeds of *S. sesban* are dormant and germination is low without treatment (Kusekwa *et al.*, 1993; Wanyondu, 1990). The hot wire pretreatment, which has been recommended for seed testing (Poulsen *et al.*, 1998),

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