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Viability studies of hardened and pelleted seeds of pearl millet

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SUMMARY

An experiment was conducted to assess the storage potential of hardened and pelleted seeds of pearl millet (CoHCu 8). The seeds were treated with different hardening and pelleting treatment using chemicals, growth regulators and botanicals and pelleted with Di-ammonium Phosohate (DAP) and gypsum powder. The treated seeds were packed in cloth bag and 700 gauge polythene bag and stored under ambient conditions. The results indicated that the hardened seeds of pearl millet could be stored for 60 days in cloth bag and 75 days in 700 gauge polythene bag whereas hardened cum pelleted seed could maintain its viability upto 45 days in cloth bag and 60 days in 700 gauge polythene bag.

Key words : Pearl millet, Hardening, Pelleting, Storage, Viability.

Pearl millet [*Pennisetum glaucum* (L.)] is the most widely grown type of millet and grown in an area of about 2,60,000 km² worldwide. It accounts for approximately 50 per cent of the total world production of millets. Though, pearl millet is well adapted to production systems characterized by low rainfall, low soil fertility, and high temperature where other cereals will not survive, moisture stress during germination and seedling establishment affect the crop stand and productivity. Seed hardening treatment in addition to promoting rapid germination before depletion of available soil moisture also enhances the seedling establishment even under drought conditions. Seed hardening along with pelleting of seeds with nutrients will give an initial boost for germinating seeds and growing seedlings. Sometimes, farmers are unable to sow the hardened and pelleted seeds immediately due to erratic rainfall and non availability of labour. Under such circumstances, the sowing is to be postponed for some period resulting in the storage of hardened and pelleted seeds. So, study on the storage potential of hardened and pelleted seeds has paramount importance in farmers' point of view. With this background, an experiment was undertaken at the Department of Seed Science and Technology, Tamil Nadu Agricultural University, Coimbatore to evaluate the vigour and viability potential of hardened and pelleted seeds.

MATERIALS AND METHODS

The seeds of pearl millet (COHCu 8) with 8 per cent initial seed moisture content were thoroughly cleaned and graded using 4/64" (1.6mm) round perforated sieve followed by soaking the seeds in solutions of KCl (2%), KH_2PO_4 (2%), Brassinolide (0.1 ppm), Salicylic acid (200 ppm) and prosopis leaf extract (1%) at seed to solution ratio (600ml kg^{-1} of seeds) of 1:0.6 (w/v basis) for 6 h. After soaking, the seeds were shade dried for 24h and then sun dried for 3 h to bring back to its original moisture content (8%). Then the hardened seeds were pelleted with Di-ammonium Phosphate (DAP) powder (100g kg^{-1}), gypsum (300 g kg^{-1}) and $ZnSO_4$ (100 mg kg^{-1}). For pelleting, 10 per cent maida gruel @ 150 ml kg^{-1} of seed was used as an adhesive. The maida gruel was prepared by dissolving 10g of maida flour in 100 ml of water and then boiling for 5 minutes. The seeds were pelleted thoroughly without forming any aggregates using hand operated seed pelletizer. The experimental details of hardening and pelleting are given below : T_1–Control (unhardened seeds), T_2–Seed hardening with 2% KCl, T_3–Seed hardening with 0.1 ppm brassinolide, T_4–Seed hardening with 200 ppm salicylic acid, T_5–Seed hardening with 2% KH_2PO_4 + pelleting with DAP 100 g kg^{-1} and gypsum 300 g kg^{-1}, T_6–Seed hardening with 1% prosopis leaf extract + pelleting with DAP 100 g kg^{-1}, gypsum 300 g kg^{-1} and $ZnSO_4$ 100 mg kg^{-1}, T_7–Seed hardening with 0.1 ppm brassinolide and 2% KH_2PO_4 + pelleting with DAP 100 g kg^{-1}, gypsum 300 g kg^{-1} and $ZnSO_4$ 100 mg kg^{-1}, T_8–Seed hardening with 0.1 ppm brassinolide and 1% prosopis leaf extract + pelleting with DAP 100 g kg^{-1}, gypsum 300 g kg^{-1} and $ZnSO_4$ 100 mg kg^{-1}, T_9–Seed hardening with 0.1 ppm brassinolide, 2% KH_2PO_4 and 1% prosopis leaf extract + pelleting with DAP 100 g kg^{-1}, gypsum 300 g kg^{-1} and $ZnSO_4$ 100 mg kg^{-1}.

Hardened and hardened cum pelleted seeds were packed in gada cloth bag (C_1) and 700 gauge polythene bag (C_2) and stored in ambient condition ($33^0 + 2^0$C and

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