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Effect of seed hardening and pellenting in sorghum under rainfed condition

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SUMMARY
Seed hardening and pelleting proves to be beneficial pre sowing treatment for sorghum under rainfed conditions. Seed hardening with 2% KH_2PO_4 followed by pelleting with DAP @100g/Kg of seeds recorded positive effect on seed yield and other growth parameters as revealed by increased values of the parameters after priming.

Key words : Seed hardening, Pelleting, Rainfed sorghum.

In rainfed cultivation, sorghum seeds are sown as pre monsoon sowing, wherein seeds are sown in dry soils and seed must wait for the sowing rain to emerge out. Again, the seed must emerge out with the available moisture. Thus to impart drought resistant to the young plains seed hardening is done as a pre sowing management technique. During hardening, the quiescent cells get hydrated and germination initiated. It also results in mitochondria activity leading to the formation of high-energy compounds and vital bio molecules. When the imbibed seeds arc dried again, triggered germination is halted. When such seeds are sown re imbibition begins and germination continues. As a consequence the plants are prepared to resist the adverse weather conditions. In this contest, potassium hydrogen phosphate is recommended for hardening. But storage of hardened seed arises when failure of expected monsoon occurs. Hence, to study the effect of hardening combined with pelleting on productivity and assess the storability of hardened seeds, this experiment was planned in sorghum.

MATERIALS AND METHODS

The experiment was conducted at Regional Research Station, Aruppukottai as rainfed crop. Graded seeds of sorghum var., APK 1 was hardened (soaking) for 1 6h and dried back to original moisture content before pelleting. For pelleting, DAP was powdered and rice gruel was used as a sticker. Hardened seeds were stored for 15 and 30 days as per the treatments in cloth bags. The experiment was organized in Randomized block design with six treatments and four replications. The treatments were:

T_1 - Control
T_2 - Hardening with 2% KH_2PO_4
T_3 - 2% KH_2PO_4 hardening and pelleting with DAP 100gm/kg of seeds
T_4 - Pelleting with DAP 100gm/kg of seeds
T_5 - Hardening with 2% KH_2PO_4 and stored for 15 days
T_6 - Hardening with 2% KH_2PO_4 and stored for 30 days

Germination percentage was assessed in laboratory conditions as per ISTA (1999). The yield parameters plant height, ear head length/weight and seed yield were recorded at the time of harvest. The results were subjected to analysis of variance and tested for significant differences (P=0.05) as described by Panse and Sukhatme (1967). Percentage values were transformed to arcsine values prior to statistical analysis.

RESULTS AND DISCUSSION

Seed hardening recorded positive effect on seed yield and other growth parameters as revealed by increased values of the parameters after priming. Treatment differences due to hardening treatments were significant for all the quantitative traits under study except the plant height recorded at the time of harvest (Table 1.).

Germination:

The germination percentage was neither improved nor affected by the hardening/pelleting treatments except the hardened seeds stored, for some period of time before sowing. Rate of emergence is observed to increase but not the percentage increase. The decline in germination in stored seeds might be due to depletion of food reserves and decline in synthetic activity or due to the phenomenon of ageing associated with irreversible physical, physiological and biochemical changes occurring in them (Abdul Baki and Anderson, 1972). Seeds stored for 30 days after hardening recorded very low germination percentage (47%). The imbibition process that occurred during hardening might have lead to faster biochemical

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