

Effect of seed invigoration treatments on vigour and viability in blackgram [*Vigna mungo* (L.) Hepper]

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SUMMARY

Studies were conducted to identify dry permeation techniques for maintenance of vigour and viability of blackgram seeds using two halogens viz., chlorine and iodine through calcium carbonate as carrier. Seed invigoration using bleaching powder @ 2 g or iodine crystals @ 100 mg through calcium carbonate as carrier @ 2 g kg⁻¹ of seed proved effective. The positive effects observed could be explained based on cellular corrective functions reflected over lower conductivity and quenching of free radical reactions with lower lipid peroxidation values in treated seeds.

Key words : Balckgram, Seed invigoration, Halogenation, Vigour, Viability, Storability.

Blackgram is one of the important pulse crops in India and an essential supplement to cereal-based diet. Increase on the performance of the crop, needs no emphasis, where most grain legume production is for human consumption. The yield enhancement achieved in this crop is far from satisfactory inspite of attempts made through genetic improvement towards higher harvest index, response to management practices and related factors. Of the several factors for poor performance seed quality is important. The changes in relative humidity, in combination with temperature accelerate senescence, during storage ultimately reducing the vigour, viability (TeKrony and Egli, 1977) and the field performance of the resultant crop. Any treatment given to high vigour seeds at the time of packing for maintaining physiological stamina and germination will be beneficial. Simple hydration- dehydration reported to augment seed storability (Suneeta *et al.*, 2003), was effective only in stored seeds and could not be advocated to fresh seeds due to the soaking injury experienced in pulse crop (Saha and Basu, 1984). Considering the case effectiveness and elimination of the problem of seed drying, vapour treatment using halogens has been recommended (Rudrapal and Basu, 1980; Bhattacharya and Basu, 1990; Pal and Basu, 1994). To identify the effect of this treatment in blackgram the present study has been attempted.

MATERIALS AND METHODS

Fifteen days old blackgram seeds with a germination

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of 96 per cent were cleaned and dried to uniform moisture content ($10.5 \pm 0.2\%$). Seeds retained in round perforated sieve of 8/64" diameter were used for dry dressing separately using calcium oxychloride (bleaching powder) @ 2, 4, 6 and 8 g kg⁻¹ and iodine crystals @ 50, 100 and 150 mg kg⁻¹ of seed using calcium carbonate as carrier @ 2 g kg⁻¹ of seed to standardize the dosage. The treated seeds along with control were placed in airtight narrow mouthed glass bottles for varying durations viz., 24, 36 and 48 h and transferred to separate bottles for 7 days for stabilization. Immediately after treatment the seeds were placed in 15 x 10 cm cotton net bags and subjected to accelerated ageing with $95 \pm 2\%$ RH and $38 \pm 1^\circ\text{C}$ temperature for 8 days (Delouche and Baskin, 1973) with daily shuffling. After ageing, the treated seeds along with control were tested for germination in paper medium (ISTA, 1999), using inclined paper plate method (Punjabi and Basu, 1982). Calcium oxychloride 2g kg⁻¹ for 24 h and iodine crystals 100 mg kg⁻¹ for 36 h proved optimum. Comparative efficacy of these two halogens was studied by storing the seeds at ambient conditions for 12 months (mean RH $60.8 \pm 2\%$; temperature $29.4 \pm 0.8^\circ\text{C}$) and tested at an interval of three months.

Electrical conductance of seed leachate was measured using 25 seeds soaked in 50 ml of deionised water for 8 h and expressed in $\text{dSm}^{-1} \times 10^{-3}$ (Presley, 1958). Using five embryonic axes dehydrogenase activity was assessed after Kittock and Law (1968) using methyl cellosolve solvent. Lipid peroxide formation was studied by the thiobarbituric acid (TBA) colour reaction outlined by Berheim *et al.* (1948). The results were subjected to analysis for significance after Gomez and Gomez (1984).

RESULTS AND DISCUSSION

A very easy and practical method of seed treatment