Pre-storage seed invigoration treatments for the maintenance of vigour, viability and field performance of high-vigour onion seed (Allium cepa L.)

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Dry seed invigoration treatments (pre-storage) of freshly harvested (high-vigour) onion seed (Allium cepa L., cv. Sukhsagar) with finely powdered pharmaceutical formulations (aspro, active ingredient ortho acetylsalicylic acid 57%, at 100 mg / kg of seed; ibucon, active ingredient ibuprofen 28.57% and paracetamol 71.42%, at 100 mg / kg of seed; celin, active ingredient ascorbic acid, at 500 mg / kg of seed), chemicals (common bleaching powder, active ingredient calcium hypochlorite, at 2 g / kg of seed) and crude plant materials (finely powdered dry red hot chilli fruit and Trigonella seed powder at 1 g / kg of seed; Catharanthus leaf powder at 2 g / kg of seed) significantly slowed down seed deterioration in comparison to untreated control under subsequent storage conditions (after accelerated and natural ageing). In general, pre-storage wet treatments did not show any beneficial effect on storability. Only a marginal improvement on germinability were noted by dipping-drying treatment over untreated control. The crop raised from the treated and untreated seeds showed that all the dry physiological treatments, especially, common bleaching powder, red chilli powder and aspro significantly improved field performance and productivity of the crop over untreated control. The membrane functions as determined by leakage of electrolytes and sugars were significantly lower in the dry treated seeds than the control. The dehydrogenase enzyme activity was also significantly higher in the treated seeds than the untreated control. The results indicate that pre-storage dry seed invigoration treatments of high-vigour onion with common bleaching powder, red chilli powder and aspro are suggested for the improvement of storability and field performance because they are inexpensive, readily available and can be easily applied.