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Effect of Seed Coating for Seed Quality Enhancement in Soybean (Glycine max (L.) Merr.)

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SUMMARY

Soybean [*Glycine max* (L.) Merr.] is an important oilseed crop belonging to family Leguminosae, sub family Papilionaceae and the genus *Glycine max* (L.). In recent decades area under soybean in our country is increasing year after year but productivity is not considerably increased and has remained almost stagnant for the past several years. There are several reasons for low productivity such as low seed germination, lack of seed vigour, poor plant stand, low seed quality and deterioration of seed quality during seed storage. Polymer seed coating along with bio-agents improves seed quality and yield of crop.

INTRODUCTION

Soybean seed has to be stored without loss of viability and vigour from the day of harvest to next planting season and also for carryover purpose. Adverse climatic condition during kharif season resulted in failure of seed production programme coupled with lower seed quality. Storage is the main problem in seed production of soybean. (ISTA, 1985) Seed viability is a major factor in crop stand establishment and subsequent productivity in many parts of the India. Losses in seed quality occur during storage if they are exposed to high temperature and humidity. Soybean seed is stored in ambient storage condition in India (Bortey *et al*., 2016). Seed germination capacity has been reported to drop sharply after two months of storage at ambient conditions (Bullerkar, 2018). Thin seed coat and exposure of embryo outside is the main cause of seed deterioration. Therefore, increase storability period of soybean seeds without decrease in seed quality parameters and biochemical activities viz., α-amylase and dehydrogenase enzymes is important (Bialecka *et al*., 2010). Coating with hydrophilic polymer regulates the water uptake, reduce imbibitional damage and improve the emergence of soybean seeds.

Seed Coating for Seed Quality Enhancement in Soybean

Seed coat of soybean is glossy due to which fungicide and bio-inoculants do not adhere to seed coat. Aqueous seed dressing resulted in increased in seed size due to imbibitions and also chocks seed drill. Polymer film coating is a new concept in which polymer forms a thin layer that adheres bio inoculants to seed and also protect seed. Polymer is a synthetic product having shelf lf life of two years. Chemically it is similar to plant secondary metabolites i.e. Gum. It is chemically inert material. Soybean has ability to fix atmospheric nitrogen by establishing a symbiotic relationship with the bacterium Bradyrhizobium japonicum and capable of transforming nearly 60-100 kg atmospheric nitrogen into 30-40 kg nitrogen in the soil and add organic matter in the soil.

Recently *Rahizobium japonicum* and Phosphorus solubilizing bacteria are available in liquid state, which can be easily applied as compare to carrier based bio-fertilizer and having shelf life of one year. Biomix is a liquid consortium of seven fungal and seven bacterial strains (Biswas et al., 2009). Biomix found to be antifungal and antibacterial in action. It contains *Trichoderma viride, Trichoderma fluorescens, Pseudomonas fluorescens, Aspergillus niger, Varticillium lecanii, Tricoderma harzianum, Trichoderma crococum, Beauveria bassiana, Acetobacter* spp. and *Gluconobacter*. Biomix is a bio-fungicide, can fix atmospheric nitrogen and contain Phosphorus solubilizing bacteria.

The polymer coat provides protection from the stress imposed by accelerated ageing, fungal infection and pest infestation. It improves emergence of seedlings and plant stand in the field. The polymer film coat may act as a physical barrier, reduce the leaching of inhibitors from the seed coverings and restrict oxygen diffusion to the embryo (Vanangamudi et al., 2003). Polymer seed coating along with biomix is carried out before sowing. Initially @ 6 ml. of polymer and @ 6 ml. of biomix per kilogram of seed to be applied uniformly on seed with hand and allow it to dry for some time after drying seed become ready for sowing.

CONCLUSION

Polymer Seed coating along with biomix @ 6 ml per kilogram of seed provides an economical approach for enhancement of seed germination, seed vigour, α-amylase enzyme content and seed yield.

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