

Seed Coating -An Innovative Technology for Enhancing Seed Quality

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ABSTRACT

The good establishment of crop mainly depends upon high quality seed that demands more germination to produce vigorous seedlings ensuring high yield. Various seed quality enhancement techniques can be employed to augment rapid and uniform germination, vigour, seedling establishment and good field stand. Seed coating is a process of applying precise amount of active ingredients along with a liquid material directly on to the seed surface without obscuring its shape and total seed weight may increase up to 1 to 2 per cent. Seed coating provides a chance to pack required amounts of materials with the goal that they can impact the microenvironment of each seed to improve seed quality and health by protecting against different soil, air and seed borne ailments.

INTRODUCTION

Efficient seed germination and early seedling establishment are important for commercial agriculture because they represent the most susceptible stages of the life cycle of crop plants. A wide range of techniques are now used to help sowing of seeds and to improve or protect seedling establishment and growth under the changing environments. Many scientists have suggested

several techniques for improving seed germination and seedlings performance in the field keeping in view, the responses of seed to temperature and water availability in the soil. Seed treatments of different types viz., priming, pelleting and coating etc. are being practiced to substantially enhance the quality of seed with the ultimate objective to enhance productivity under optimal and stressed

environments (Afzal et al., 2020). Among the seed enhancement techniques, seed coating is a easy and innovative method which improves the quality, plantability and ease of handling of seeds, ultimately leading to more efficient farming and improved yields (Ben-Jabeur et al., 2021). Seed coating serves as carrier of chemical materials along with seeds to support seedling growth. Chemical compounds such as growth regulators, inoculants, micronutrients, fungicides, insecticides and other seed protectants are applied to enhance seed performance. The commercially available plasticizers, polymers and colourants are also applied as film formulations.

Methods of seed coating

Dry seed coating: Seeds are treated with active ingredient or coating materials along with adhesives (liquid form). The seeds are stirred well or rotated in a drum for uniform coating. The coated seeds are shade dried and used for sowing.

Slurry seed coating: The seeds are coated with the active ingredients, simultaneously with the adhesives or polymers diluted in the solvents such as water @ 5 to 20 ml/ kg of seed or fevicol (@30ml/ kg of seed. Then the seeds are stirred uniformly and coated seeds are allowed to shade dry and used for sowing. Care should be taken for the use of optimum concentration of adhesives and diluents for obtaining effective coating. Seed coating with commercial polymers diluted with nutrient instead of water can increase the seed germination (Farooq et al., 2012).

Polimer / Film coating: Film coating involves application of a thin layer (usually up to 5% of seed weight) of beneficial coating agent directly to the surface of seed coat. In film coating, the active ingredient is applied in a quick drying polymer film around the seed. Fluidized-bed treaters or pharmaceutical coating drums can be used for the application of dissolved material to the surface of seed. These seed coatings provide uniform coverage on the seed surface and are reduced loss of active material from the seed during seed transport and handling

Hydrophobic polymer coating- Coating with a hydrophobic polymer can reduce rate of water up take, lower solute leakage and improve emergence of seed. It is suitable for sowing in wet soils.

Hydrophilic polymer coating- It increases germination due to the fact that the fine particle in the coating acts as wick or moisture attracting material or perhaps to improve seed soil contact.

Benefits of seed coating

- Seed coating enables application of accurate and even dose of chemicals and reduce the chemical wastage
- It reduces the risk of exposure to plant protection products for both workers and the environment
- Seed coating improves the appearance of seeds and facilitates for dust free handlings
- It aids application of nutrients, bio inoculants, fungicides and insecticides to the seeds directly
- It allows free flow of seeds in automatic machine sowing
- Coated seeds act as a temperature switch and water intake regulator
- Seed coating enhances the germination and seedling establishment

CONCLUSION

Sustainable crop production requires the adoption of low-cost and environment friendly seed enhancement techniques. Seed coating technology is being used to improve germination, reduce seedling emergence time, improve stand establishment and yield. The beneficial effects of seed coating techniques have been demonstrated for many field crops. So, seed coating is the best solution to overcome the germination related problems especially when crops are grown under unfavorable conditions.

REFERENCES

- Afzal, I. Javed, T., Amirkhani, M. Taylor, A.G. 2020. Modern seed technology: seed coating delivery systems for enhancing seed and crop performance. *Agriculture*, 10 (11) : 526. [10.3390/agriculture10110526](https://doi.org/10.3390/agriculture10110526)
- BenJabeur,M., Adrian,G.R.,Camilo., L.C., Rubén, K. Zayneb, C.K. Shawn, L.C. Marta, D.S. Maria, L.A. Jose, H. Walid. 2021. The promising MultispeQ device for tracing the effect of seed coating with biostimulants on growth promotion, photosynthetic state and water–nutrient stress tolerance in durum wheat. *EuroMediterr. J. Environ. Integr.*, 6 : 1-11, [10.1007/s41207-020-00213-8](https://doi.org/10.1007/s41207-020-00213-8)
- Farooq, M. A. Wahid, K.H. Siddique.2012. Micronutrient application through seed treatments: a review. *J. Plant Nutr. Soil Sci.*, 12 (1): 125-142, [10.4067/S0718-95162012000100011](https://doi.org/10.4067/S0718-95162012000100011)