

Enhancing Germination and Seedling Vigor in Black gram through Organic Seed Priming

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Seed priming is an approach for enhancing seed germination and seedling vigor that involves controlled hydration and drying of seeds. This process initiates the early stages of germination without allowing radical emergence, which leads to uniform crop stand and improved yield. The present study was conducted to find out the possibility of utilizing organic seed priming treatment for the improvement of seed germination and seedling vigour in black gram using various bio-formulations. Medium vigour seeds of black gram cv. VBN 11 was primed with various concentrations of bio-formulations such as seaweed (*Turbinaria conoides*) extract, fermented fish extract, “Panchagavya”, “Beejamrutha”, vermiwash along with hydropriming, and ZnSO₄ at 100 ppm was used as chemical priming agent to compare the efficiency of organic seed priming with conventional priming. The control was prepared without the treatment. Primed seeds were analyzed for physiological and biochemical seed quality parameters. The results of the present study revealed that the black gram seeds primed with 5% fermented fish extract showed significant ($p<0.05$) improvement in physiological parameters such as germination percentage (96%), speed of germination (21.67), vigour index (3574), dry matter production (292 mg/10 seedlings), and biochemical seed quality parameters such as protein content (22.7%), dehydrogenase activity (2.95), peroxidase activity (0.74 m moles of tetra guaiacol formed/min/g of seeds), catalase activity (1.5 $\mu\text{g H}_2\text{O}_2 \text{ mg}^{-1} \text{ min}^{-1}$) and α -amylase activity (13.14 mg maltose/min) among organic seed priming treatments and on par with conventional chemical seed priming treatment. Thus, 5% fermented fish extract can be used as a potential organic seed priming treatment for the improvement of seed germination and seedling vigour in black gram.

Keywords: Black gram, Fermented fish extract, Physiological parameters, Seed priming, Seedling vigour