Germination and seedling vigour of hydroprimed stored seeds of African eggplant (*Solanum macrocarpon* L.) produced under different nitrogen fertilizer rates

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Abstract

The study was conducted in the laboratory and screen house of School of Agriculture and Agricultural Technology, Federal University of Technology, Minna, Niger state, Nigeria. Effects of two factors- nitrogen fertilizer application to the mother plant at 0, 20, 40, 60, 80, 100 kg ha^{-1} and hydropriming (hydro-primed and non-hydroprimed) on Solanum marcrocarpon (cv. FUTMSm-2) seed quality were tested during a storage period of 16 weeks. The laboratory study used a 6 x 2 factorial experiment which was subjected to a completely randomized design. Data were collected on 100-seed weight, changes in moisture content during storage, germination percentage, seedling length, seedling shoot and root length. Data collected on all parameters were subjected to analysis of variance using statistical analysis system (SAS) and means were separated using Duncan's multiple range test (DMRT) where significant differences occurred among treatments. Seeds produced with 60 kg N ha^{-1} were the heaviest while seeds produced without N application was the lightest. Moisture content increased with storage period. Germination percentages were low (about 1 to 10%) at 0 to 2 weeks after storage (WAS) at all N fertilizer rates. Impressive increase in values from about 57% (at 0 kg N ha^{-1}) to 87% (at 80 kg N ha^{-1}) were recorded between 4 and 10 WAS. The highest germination percentage of about 89 was obtained at 80 kg N ha^{-1} while the poorest was recorded at 0 kg N ha^{-1}. Viability was best maintained in seeds produced with 80 kg N ha^{-1} as germination percentage of 79% was still recorded at 12 WAS as against a range of 31-56% for other N treatments. Hydropriming resulted in enhanced seed germination. Seedlings from seeds produced with application of 80 or 100 kg N ha^{-1} were generally significantly longer than those produced with 0 kg N ha^{-1}. Root length values were significantly greater in seeds produced with 100 kg N ha^{-1} compared with the values recorded with 0 kg N ha^{-1}. No consistent trends were established in respect of shoot length. Hydropriming only resulted in significant increase in seedling length at 8 and 16 WAS and in root length at 0, 8 and 16 WAS. Hydropriming did not significantly influence shoot length. It is concluded that application of nitrogen fertilizer at 80 kg ha^{-1} resulted in the production of best quality seed and that hydropriming enhanced seed germination and seedling growth.

Key words: *Solanum macrocarpon,* seed moisture content, seed quality, hydropriming, seedling vigour, seed dormancy.

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