"Seed Vigour Enhancement of Cowpea (*Vigna unguiculata* L.) Through Application of Cow-excreta"

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Abstract—*The natural products have widespread impact for seed invigoration where use of cow excreta has a potential role in enhancement of seed quantity and quality. Various modes of priming can be used for seed invigoration in which bio-priming is one of them. This idea was applied in the present study for escalation of the seed production highlighting the crop Cowpea where crop growth and seed maturity is very much affected due to poor standard concerning seed and field.*

The observable criteria in experiment considered in two aspects viz. seedling and biochemical parameters liable to enhance seedling vigour in sowing. The extracted solution from cow dung and cow urine was used as treatments (symbolized as T_0 to T_9) in alone or in combination considering its various concentrations with control. T_9 (2 % Cow dung solution, T_5 + 75 % cow urine, T_2) can be considered as best followed by T_5 (2% cow dung solution) where the treatments like T_4 (1% cow dung solution) and T_8 (1 % cow dung solution, T_4 + 100 % cow urine, T_3) specified higher performance in few cases. There was a non-significant variation in year and interaction of treatment-year combinations. The characters speed of germination, there was a significant effect found for every treatment, but in combination with year as well as within year, it showed non-significant differentiation. All or most of the treatments showed significant effect for other seedling parameters like Fresh weight, Dry weight, and Vigour Index under fresh harvested seed. Considering the effect of different treatments, T_9 and T_5 showed topmost effect though T_8, T_4 were good only a few cases. The ultimate quality indicator was bio-molecular activity of seed where alpha amylase action at germination, amount of soluble protein content, production of RNA was observed. The treatment effect showed maximum outcome in T_9 and T_5, sometimes in association with T_8 and T_4. Normally, the enzyme alpha amylase improved the germination process. The treatment effect maintained the nature where T_9 and T_5 were best. The soluble protein content and RNA content was improved with the process of germination where best reaction was authenticated by T_9 and T_5 with a non-significant relation in soluble protein only. Therefore, it was clear that the treatment effect was very much positive with the different characters.

After application of different treatments, the qualitative up gradation of seed amplified the seedling quality and plant produce in ultimate. The beneficial nature of cow dung in specific combinations viz. T_5, T_9 or more specifically T_9 may be considered as technical tool for seed production system of Cowpea.