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Effect of organic and inorganic sources of fertilizer on seed germination of *Solanum melongena* var “Lena iri”

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Considering the problems associated with the use of synthetic agrochemicals, people prefer organic food. Hence there are trends toward organic farming in the world. Organic fertilizers contain the essential nutrients for plant growth, are environmentally friendly, and increase soil microbial activity. In the current study, the germination of brinjal (*Solanum melongena*) seeds was examined in relation to the effects of seven different types of organic fertilizers (chicken manure, cow dung, goat manure, rice husks, compost, vermicompost, and a mixture of all above), a commercial inorganic fertilizer (positive control), and a soil and coir dust mixture without the addition of any organic or inorganic fertilizer (negative control). Sieved organic fertilizers given above were mixed as follows: 50% of each type of organic fertilizer was mixed with 40% soil and 10% coir dust. The inorganic fertilizer mixture was prepared with 90% soil, 10% coir dust and 2 g (recommended by the producer) of commercial inorganic fertilizer. Negative control was prepared by mixing 90% of soil and 10% of coir dust without adding any type of organic or inorganic fertilizer. Equal amounts of soil mixtures were filled into plastic trays (30 cm x 20 cm). Each treatment and controls were tested in triplicate and arranged in a complete randomized design. Seeds (32) were sown in each tray and equal amount of water was added to each tray as required. The number of total seedlings in each replicate was counted daily for 42 days until seedlings reached to transplanting stage. Seed germination percentage and germination index were calculated, and data were statistically analyzed by using one way ANOVA test. According to the results of One-Way ANOVA test, there was a significant difference in average seed germination percentage ($p = 0.001$) and in average germination index ($p = 0.000$) among the treatments. Significantly high germination percentage and germination index were observed in negative control containing 90% of soil and 10% coir dust. This finding indicates a low impact of all types of organic fertilizers applied in germination of *S. melongena* seeds. A similar impact to that of negative control was also observed with commercially available inorganic fertilizer used. Compost, vermicompost and the mixture of organic fertilizers exhibited a medium germination percentage while Cow dung, Goat manure, Chicken manure, and Rice husks showed a much lower impact on seed germination percentage. When comparing seed germination rates, chicken manure showed the lowest germination rate while the other organic fertilizers exhibited medium germination rates. Only 50 % of each of the organic fertilizer was used in mixture as the seeds have some amount of stored food to be used during germination and recommended that large amounts of fertilizers are not necessary for germinating seeds. But it was evident that still the use of 50% of organic fertilizer by weight had a negative effect on seed germination of *S. melongena* and could be due to the phenomena called nutrient toxicity and hence application of 50% organic fertilizer is not recommended for the seed germination of *S. melongena*.

Keywords: Inorganic fertilizer, Organic fertilizer, Seed germination index, Seed germination percentage, *Solanum melongena*