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Formulation of low cost liquid organic fertilizers using aquatic and terrestrial weeds enriched with poultry manure

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Organic fertilizers have currently become a popular alternative due to the high cost of chemical fertilizers and their adverse impacts on the environment. Weeds could be effectively used to develop organic fertilizers to add essential nutrients for plant growth. This study was aimed at developing low cost liquid fertilizers from widely available weeds.

In this study, *Gliricidia sepium*, *Croton laccifer*, *Tithonia diversifolia*, *Mikania scandens*, *Chromolaena odorata*, *Wedelia trilobata*, *Clerodendrum paniculatum*, *Thespesia populnea*, *Pistia stratiotes*, *Salvinia molesta*, *Eichhornia crassipes*, and thesea weeds, *Ulva lactuca* and *Sargassum wightii* were used. A sample of 100 g from terrestrial weed shoots was mixed separately with 1 L of water in closed plastic buckets and allowed to decompose for 06 weeks. Based on the highest levels of nitrogen (N), phosphorus (P) and potassium (K) in decomposed extracts, *G. sepium*, *C. laccifer*, *M. scandens* and *C. odorata* were selected for further study. Samples of these leaf materials were mixed with 20% and 40% poultry manure separately, using 2 L of water and allowed to decompose for a period of 08 weeks. As the best level, 40% poultry manure combinations were selected based on the highest levels of N, P and K. In an another attempt, aquatic weeds in different combinations (50% *Ulva* + 50% *Eichhornia*, 50% *Sargassum* + 50% *Eichhornia*, 50% *Ulva* + 50% *Salvinia*, 50% *Sargassum* + 50% *Salvinia*, 75% *Salvinia* + 25% *Sargassum*, 75% *Eichhornia* + 25% *Sargassum*, 75% *Eichhornia* + 25% *Ulva*, 75% *Salvinia* + 25% *Ulva* and 25% each with *Ulva*, *Sargassum*, *Eichhornia* and *Salvinia*) were used. Fresh weeds (1 kg) were mixed separately with 1 L of water and decomposed as above. As the best combinations, 50% *Ulva* + 50% *Salvinia*, 50% *Sargassum* + 50% *Salvinia*, 75% *Salvinia* + 25% *Ulva* and 25% each with *Ulva*, *Sargassum*, *Eichhornia* and *Salvinia* were selected. These liquids were diluted 1:1 with tap water and 4 mL of each liquid was sprayed on *Basella alba* and *Alternanthera sessilis* grown on pots in the plant house on a weekly basis for two months, comparing with an imported, commercial liquid fertilizer as the standard.

In terms of the growth parameters measured *i.e.* shoot height, leaf length, number of leaves, leaf area, fresh weight and dry weight, the 60% *G. sepium* + 40% poultry manure and 50% *Ulva* + 50% *Salvinia* mixtures were the most effective combinations for the growth of both crops. The liquid fertilizers developed with these combinations were as effective as the standard commercial liquid fertilizer used in terms of the growth performance of the two crops studied.