

EFFECT OF THE APPLICATION OF SEAWEED WASTE AS FERTILIZERS ON GROWTH AND YIELD PERFORMANCE OF BRINJAL (*Solanum melongena* L.)

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Abstract:

Seaweed is a macroalgal community that is commonly found in the coastal belt of Sri Lanka and is underutilized. The use of seaweed as a fertilizer for crops is limited in the country. Therefore, this study was aimed to analyse the nutrient composition of seaweed and to assess the effect of seaweeds fertilizer application on the growth and yield of brinjal. Seaweeds such as *Sargassum* spp. and *Turbinaria* spp. were collected from the coastal regions of the Jaffna peninsula. The collected samples were dried and ground to a fine powder. Potting mixture for the crops was prepared using different ratios of dried soil, cow dung, and seaweed. Seven treatments were designed with three replicates such as soil as control (T1), soil + 100g *Sargassum* spp. (T2), soil + 50g *Sargassum* spp. + 50g cow dung (T3), soil + 100g *Turbinaria* spp. (T4), soil + 50g *Turbinaria* spp. + 50g cow dung (T5), soil + cow dung at 2:1 ratio (T6) and soil + 100g cow dung (T7). Nutrients were analysed for both dried seaweed powder and potting mixture using standard methods. Growth and yield of brinjal were observed and recorded. In *Turbinaria* spp. the estimated K, Na, N, Ca and P concentrations (ppt) were 3650 ± 5.17 , 837 ± 1.76 , 276 ± 3.06 , 163 ± 4.18 and 19 ± 1.53 , respectively whereas in *Sargassum* spp. these were 2350 ± 7.64 , 794 ± 2.19 , 187 ± 1.53 , 221 ± 1.33 , and 17 ± 1.53 , respectively. Similarly, the pH of the seaweed powder was slightly alkaline (pH=8±0.1). The amount of K in the potting mixture decreased dramatically at the end of the experiment while amounts of N, P and Ca were constant. Plant height ($p < 0.05$) differed significantly at 2 weeks interval and at 14th week, it was high (54.6 ± 3.17 cm, $p < 0.05$) in T6 followed by T7 (51.97 ± 0.83 cm). The total number of flowers was significantly ($p = 0.0001$) high (40 ± 0.34), in T6 next to T3 (36 ± 0.33). The treatment T6 had a significant average fruit weight per plant ($2,389 \pm 0.56$ g), next to T3 (2142 ± 0.33 g). The average yield of brinjal was high (>39 tons/ha) in medium added with *Sargassum* spp. which was higher than (30 tons/ha) the recommended yield. A high amount of cow dung was added (2 kg) for T6 and only 50 g was added for T3. However, both treatments T6 and T3 showed a better performance of growth and yield. Therefore, considering the cost of cow dung, it is recommended to use 50 g *Sargassum* spp. + 50 cow dung mixed with soil (T3) as a seaweed fertilizer for the brinjal cultivation.

Keywords: Seaweeds, Nutrients, Analysis, Crops, Growth, Yield