

**COMPARISON OF NATURAL (*Sargassum crassifolium*)
AND COMMERCIALY AVAILABLE (Maxicrop)
SEAWEED LIQUID EXTRACTS ON GROWTH AND
YIELD OF *Vigna unguiculata* L.**

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SRI LANKA

2018

PROCESSED

ABSTRACT

Indiscriminate use of agrochemicals leads to environmental degradation and hence challenging safe and healthy food for increasing population in the world. Efforts are underway for the sustainable way of crop production with organic fertilizers and botanicals from natural resources to enhance the production of crops. In this scenario, use of seaweed in Agriculture has become popular. Although Sri Lanka has seaweeds in plenty, commercial use of those natural resources reached less attention. Recent studies have proved that 20% seaweed liquid extract gave best performances in tomatoes and maize. In this regard, a pot experiment was conducted in the Crop Farm of Eastern University, Sri Lanka to compare the performance of natural seaweed liquid extract of *Sargassum crassifolium* with Maxicrop (commercially available seaweed liquid extract) on the growth and yield of *Vigna unguiculata* L.. The experiment was arranged with five treatments in Completely Randomized Design with eight replications (T1: 20% seaweed liquid extract + compost, T2: Maxicrop + compost, T3: 20% seaweed liquid extract + Department of Agriculture, Sri Lanka (DoA) recommended inorganic fertilizer, T4: Maxicrop + DoA recommended inorganic fertilizer, T5: Distilled water + no fertilizer (control)) and their performances on the growth and yield of *Vigna unguiculata* L. were investigated. The liquid extract of *Sargassum crassifolium* was applied five times at one week interval from the second week after planting and Maxicrop was applied at the onset of flowering as per the product recommendation and thereafter continued up to 7th week after planting, at weekly interval.

Foliar application of natural seaweed liquid extract of *Sargassum crassifolium* and Maxicrop showed significant ($p < 0.05$) effect on growth and yield of *Vigna unguiculata* L. when compared to control plants. The maximum growth and yield

performance was observed in plants applied with both natural seaweed liquid extract of *Sargassum crassifolium* (T3) and Maxicrop (T4) with the DoA recommended inorganic fertilizer treatments. Further foliar application of 20% seaweed liquid extract of *Sargassum crassifolium* with DoA recommended inorganic fertilizer showed significant ($p < 0.05$) effect on growth and yield parameters of *Vigna unguiculata* L. over the plants applied with Maxicrop with DoA recommended inorganic fertilizer.

The 20% seaweed liquid extract of *Sargassum crassifolium* increased plant height (9.54%), number of leaves per plant (12.5%), chlorophyll content of leaves (5.23%), leaf area (27.27%), fresh weight of leaves (35.16%), dry weight of leaves (32.54%), fresh weight of stem (40.16%), dry weight of stem (39.58%), root length (28.53%), number of first order lateral roots (27.27%), fresh weight of root (30.48%), dry weight of root (32.89%), total number of root nodules (61.33%), number of effective nodules (94.19%), weight of nodules (90.75%), mean number of flowers per plant (52.94%), average length of pods (27.27%), number of seeds per pod (30%), weight of seeds per pod (27.33%), 100 seeds weight (13.9%) in comparison to plants applied with Maxicrop with DoA recommended inorganic fertilizer.

This might be due to the presence of macro and micronutrients as well as growth promoting substances like auxins and cytokinins in seaweed liquid extracts which regulate number of plant functions including cell division and plant growth, activate nodulation-related proteins during early nodulation process (cytokinins), promote root development (Phosphorus - P), root growth (Magnesium - Mg), stimulate flowering (Potassium - K) and ultimately enhance growth and yield of plant by initiating robust plant growth.

From this study, it was found that the foliar application of natural seaweed liquid extract of *Sargassum crassifolium* and Maxicrop significantly increased the growth

and yield of *Vigna unguiculata* L. when compared to control plants and the highest growth and yield performance was observed in plants applied with both natural seaweed liquid extract of *Sargassum crassifolium* (T3) and Maxicrop (T4) with the DoA recommended inorganic fertilizer treatments. Further, it was observed that 20% seaweed liquid extract of *Sargassum crassifolium* with the DoA recommended inorganic fertilizer (T3) gave the best performance when compared to Maxicrop applied with DoA recommended inorganic fertilizer (T4). Therefore, it could be concluded that 20% seaweed liquid extract of *Sargassum crassifolium* with the DoA recommended inorganic fertilizer can be recommended to enhance the growth and yield of *Vigna unguiculata* L. which is environment friendly.

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