EFFECTS OF FOLIAR APPLICATION OF SEAWEED (*Sargassum crassifolium*) LIQUID EXTRACT ON THE PERFORMANCE OF *Lycopersicon esculentum* Mill. IN SANDY REGOSOL OF BATTICALOA DISTRICT

NISHANTHI SIVASUBRAMANIAM

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

SRI LANKA

2014

ABSTRACT

The challenges faced by the agriculture sector are immense, today. The growing agricultural practices need more fertilizers for higher yield. At present, wide spread requirement for environment friendly agriculture for the production of quality and healthy food to nourish the increasing population is in high demand. Efforts are underway for the sustainable way of crop production with organic fertilizers and botanicals from natural resources to enhance the production of commercially important crops. In this regard, a preliminary study was conducted to find out the availability of seaweeds in Batticaloa coastal area from Pasikudah to kallady and further to down to Periyaneelavanai by direct observation followed by, the seaweed liquid extract was prepared from collected seaweeds which were in plenty in quantity and physio-chemical properties of seaweed liquid extract was analyzed. In addition, a field experiment was conducted at the Crop Farm, Eastern University, Sri Lanka, Vantharumoolai to find out the effects of seaweed (*Sargassum crassifolium*) liquid extract foliar application on growth, yield and quality performances of *Lycopersicon esculentum* Mill. (*cv.*Thilina). The experiment was arranged in a Randomized Complete Block Design (RCBD) with five treatments and four replications. Once a week the seaweed extract at different concentration (10%, 20%, 50% and 100% (v/v)) were applied to tomato plants at five times from three weeks after transplanting and their performance was recorded once at biweekly interval. Preliminary study revealed that, brown seaweeds were the major seaweed in Batticaloa coastal area, among which *Sargassum crassifolium* available in plenty. Further, seaweed extract prepared from the brown seaweed, *Sargasssum crassifolium* had macro nutrients like Nitrogen, Potassium, Phosphorous and micronutrients like

Iron, Zinc, Manganese and copper. Foliar application of *Sargasssum crassifolium* extract had significant ($p<0.05$) effects on tested parameters of Tomato over the control. Seaweed extract with 20% of foliar application increased plant height (16%), leaf number (84.98%), leaf area (64.71%) , shoot dry weight (80.92%) , root dry weight (81.57%) , flower number per plant (50.37%) , fruit number per plant (57.87%) , fruit yield per hectare (58.70%) along with Total Soluble Solids (25.71%) and Total acidity (76.95%) content of fruit significantly over the control while seaweed extract with 100% of foliar application reduced above mentioned parameters significantly over the control in Tomato plants. Therefore, it could be concluded that the seaweed extract at 20% concentration level can be used to enhance the growth, yield and quality of fruits of *Lycopersicon esculentum* Mill. plants.

TABLE OF CONTENTS