RESPONSE OF SELECTED ORGANIC, INORGANIC AND BIOFERTILIZERS ON PIGMENT CONTENT (CHLOROPHYLL AND CAROTENOID) IN *LYCOPERSICON ESCULENTUM* VAR. S-22

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ABSTRACT

The experiment was carried out the response of organic, inorganic and biofertilizers on chlorophyll carotenoid content in tomato. The present study revealed that the organic manure (cowdung and vermicompost) treated plants showed significant effect than other inorganic and biofertilizers. A progressive decline in chlorophyll and carotenoid content from vegetative stage to reproductive stage was observed in all the treated plants.

Keywords: Organic fertilizers, Inorganic fertilizers, biofertilizers, Tomato, Vermicompost.

INTRODUCTION

Fertilizer is one of the major factors of crop production. Among the factors nitrogen is very much essential for good plant establishment and expected growth (Uddin and Khalequzzaman, 2003).Organic agricultural practices aim to enhance biodiversity biological cycles and soil biological activity so as to achieve optimal natural systems that are socially ecologically and economically sustainable (Samman *et al*. 2008). Biofertilizers are low cost, renewable sources of plant nutrients. These are selected strain of beneficial soil microorganisms cultured in the laboratory and packed in suitable carrier. Biofertilizers are gaining momentum recently due to the increasing emphasis on maintenance of soil health,

minimize environmental pollution and cut down on the use of the chemicals in agriculture.By controlling soil borne diseases, improving the soil health and soil properties, these organisms help not only in saving, but also in effectively utilizing chemical fertilizers and result in higher yield rates (Anonymous, 2008). Chemical pollutants are extremely dispersed in the environment and cause severe problems to human health, soil as well as the environment. In agro ecosystems, the use of synthetic toxic chemical pesticides affects the soil fertility and growth of cultivated crops (Ignacimuthu and Vendan, 2007).

They cause chlorophyll organs of plant to grow by absorbing required carbon, giving nutriments to plant and increasing efficiency of photosynthesis, showed that mycorrhiza-inoculated maize plants have more dry matter than non-inoculated plants due to salinity. Also inoculation of salt stressed tomatoes with mycorrhiza meaningfully increased their dry weight of root and shoots compared to non-mycorrhiza inoculated plants (Al-Karaki, 2000).The chlorophyll content in mulberry was increased due to AMF and *Azotobacter* inoculation (Reddy *et al*. 2003).

MATERIALS AND METHODS

Lycopersicon esculentum var. S-22 seeds were taken for the present study.The tomato seeds (*Lycopersicon esculentum* var. S-22) and the fertilizers choosen for the study were (cow dung, vermicompost, urea, VAM and Tricholine-LF) collected from Tamilnadu Government Agriculture Extension Centre, Nagercoil. The treated seeds were sown in six experimental pots. One of the pot was used for sowing control seeds of *Lycopersicon esculentum* without supplying any fertilizers. The remaining five pots were treated as experimental pots in which 2.5gm of seeds inoculation with fertilizer were sown. Irrigation was done at regular intervals without causing any physical damages. The seedlings were grown until ripening of seeds.

All the experiments were conducted with three replications. The experimental data were statistically analyzed. The different inoculations were as follows: Control, Cow dung, Vermicompost, Urea, VAM, and Trichoine-LF

RESULTS AND DISCUSSION

The chlorophyll (a) content in leaves of *Lycopersicon esculentum* var. S22 is presented in Figure 1.Chlorophyll(a) content gradually increases from 0-30th day and then gradually decreases upto 50th day in all the treatment on the 50th day the control showed the minimum value of 0.46±0.02mg. It is followed by urea, VAM, Tricholine-LF and vermicompost showed the value of 0.48±0.01mg/g, 0.53±0.02mg, 0.58±0.01mg and 0.63±0.01mg respectively. The maximum was recorded in cowdung treated plants (0.67±0.009mg)

The chlorophyll (b) content in *Lycopersicon esculentum* var. S22 is presented in Table 2 and Figure 2. Chlorophyll(b) content gradually increases from 0-30th day and then gradually decreases upto 50th day in all the treatment on the 50th day the control showed the minimum value of 0.26±0.01mg/. It is followed by urea, VAM, Tricholine-LF and vermicompost showed the value of 0.33±0.02mg, 0.42±0.01mg, 0.49±0.02mg and 0.58±0.01mg respectively. The maximum was recorded in cowdung treated plants (0.64±0.02mg).

The total chlorophyll content in leaves of *Lycopersicon esculentum* var. S22 is presented in Table 3 and Figure 3.Total Chlorophyll content gradually increases from 0-30th day and then gradually decreases upto50th day in all the treatment on the 50th day the control found the minimum value of 0.72±0.01mg. It is followed by urea, VAM, Tricholine-LF and vermicompost showed the value of 0.81±0.02mg, 0.95±0.01mg, 0.07±0.01mg and 1.21±0.02mg respectively. The maximum was recorded in cowdung treated plants (1.31±0.02mg)

The carotenoid content in leaves of *Lycopersicon esculentum* var. S22 is presented in Table 4 and Figure 4.Carotenoid content gradually increases from 0-30th day and then gradually decreases upto 50th day in all the treatment on the 50th day the control recorded the minimum value of 0.34±0.01mg. It is followed by urea, VAM, Tricholine-LF and vermicompost showed the value of 0.39±0.01mg, 0.46±0.01mg, 0.49±0.02mg and 0.58±0.01mg respectively. The maximum was recorded in cowdung treated plants (1.31±0.02mg).

Figure1: Response of fertilizers on the chlorophyll (a)content in leaves of *Lycopersicon esculentum* var. S22 (values in mg)

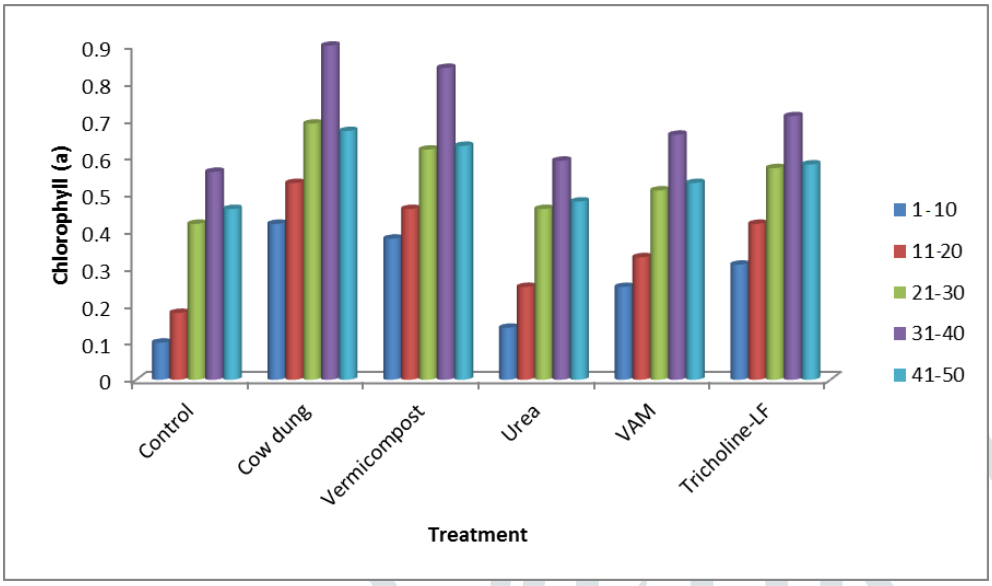


Figure 2: Response of fertilizers on the chlorophyll (b) content in leaves of *Lycopersicon esculentum* var. S22 (values in mg)

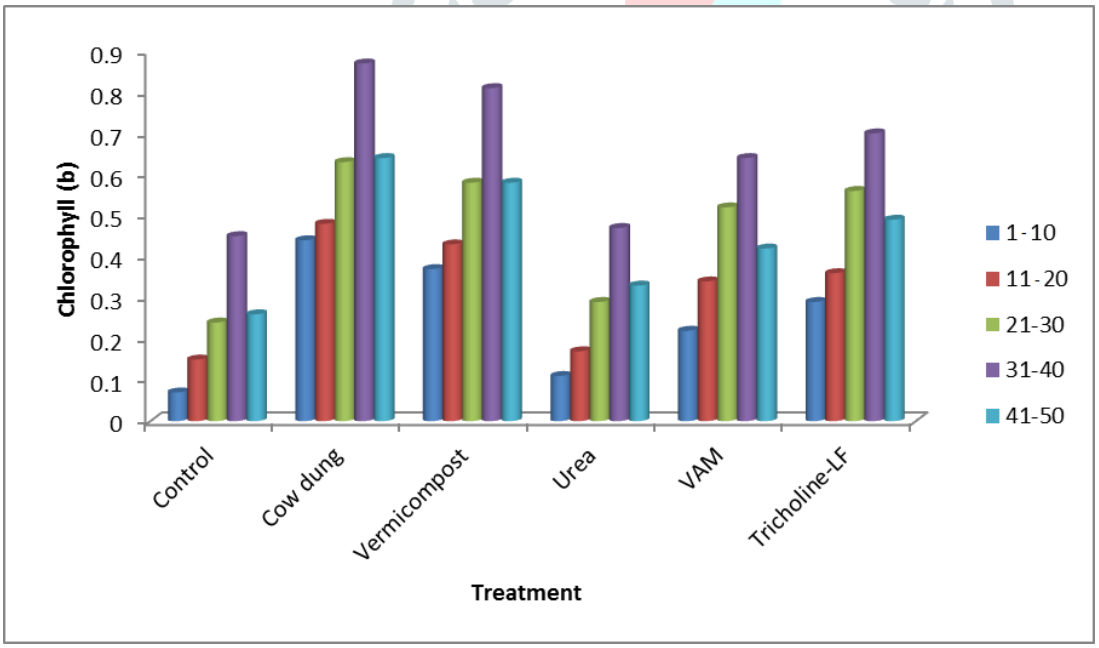


Figure 3: Response of fertilizers on the total chlorophyll content in leaves of *Lycopersicon esculentum*var. S22 (values in mg)

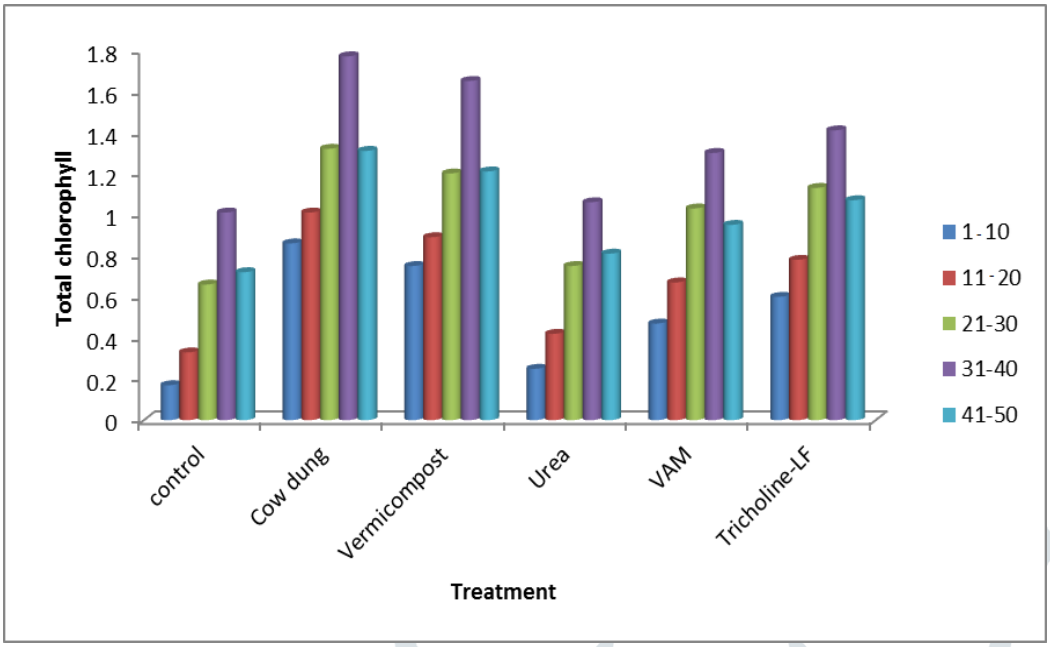
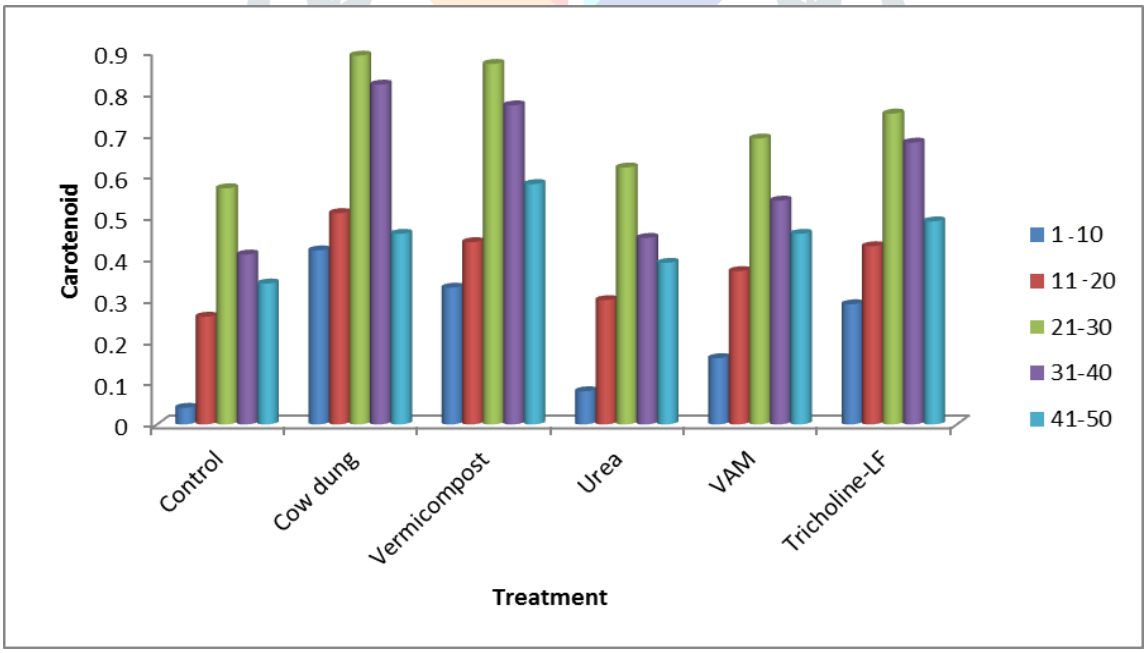


Figure 4: Response of fertilizers on the carotenoid content in leaves of *Lycopersicon esculentum* var. S22 (values in mg)



DISCUSSION

In the present study the maximum value of chlorophyll content were showed in the plant treated with organic manures such us cowdung and vermicompost the minimum was observed in control. Similar findings of increased chlorophyll content may be due to fertilizer application was recorded in various plants such as soybean (Thiyageswari and Selvi, 2006). Maize (Tejeda *et al.* 2008). The carotenoid content of the present study the maximum amount were showed in the plant treated with organic manures such us cowdung and vermicompost the minimum was observed in control. Similar findings were reported in *Acanthus illicifolius* (Ravikumar *et al.* 2004) and paddy (Rajasekaran *et al.* 2015). The increase in carotenoid content might be due to enhanced influence of nitrogen and other organic elements present in the effluent (Subramani et al. 1999).

The pigments (chlorophyll and carotenoid) were noticed high in organic fertilizer treated plants. A progressive decline in chlorophyll and carotenoid content from vegetative stage to reproductive stage was observed.From the present study it is concluded and that the organic fertilizers treated plants of *Lycopersicon esculentum* var. S-22 was more effective than control and other fertilizers treatments.

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