CHAPTER- V
DISCUSSION
DISCUSSION

India is the second largest producer of vegetables next to China. Vegetables are the vital source of minerals, vitamins and dietary fibers and thus play an important role in human nutrition in supplying adequate quality of free radicals, antioxidants and micro nutrients.

Crop yield depends upon photosynthates and their distribution among various plant parts. The production and translocation of synthesized photosynthates depends upon mineral nutrition supplied either by soil or through foliar application. The nutrient supply is one of the important factors that determines the growth of the crop.

The sustainable production at higher levels is possible only by the proper use of fertilizers which will help to increase the organic matter content of soil. Various fertilizers like farm yard manure, vermicompost, and poultry manure etc. are added to the soil from time to time to enrich the organic matter in the soil (Palaniappan and Annaduria, 1999). The application of fertilizers can help in improving the yield levels in most of the crops under different agro- ecological regions, through correction of the deficiency of secondary nutrients and micro nutrients. Fertilizers also found to be improving the soil physical properties, which provide health and favorable soil conditions to enhance nutrient use efficiency. An adequate supply of plant nutrient is necessary for enhanced metabolic activity which intern could influence the plant growth.

Realizing this, the present investigation was conducted to know the impact of bio fertilizer and chemical fertilizer on Glycine max (Soya bean) and Phaseolus vulgaris (French bean).
Influence of bio fertilizer and chemical fertilizer on Growth and Yield.

**Soya bean (Glycine max).**

The results obtained for Soybean crop reveal that, the growth parameters like, plant height, number of branches, number of leaves, were significantly higher with the treatments T10, T7 and T4 (fig., 4.1, 4.2 and 4.3 respectively). The plant height, number of branches and number of leaves were significantly maximum with treatment T10 in all the stages of plant growth followed by T7 and T4 and lowest with T1 control. This is due to the application of growth promoting substances which increased photosynthetic activity and enhancement in mobilization of photosynthesis and change in the membrane permeability. The results of the investigation under study are in conformity with Jain (1995), Sharma (2002), Patel (1998), Chandrashakar Reddy and Malla Reddy (2005).

The dry matter accumulation varied significantly due to the application of bio fertilizer and chemical fertilizer at all the crop growth stages.

The treatment T10 recorded significantly higher total dry matter production compared to control. This was due to higher dry matter production in leaf, stem and pod (Fig 4.7, 4.8 and 4.9 respectively). The dry matter production was the result of higher translocation of photosynthesis from leaf and stem to the pods at later stages. Similar results were reported by Olivera (2002), Dileep Kumar (2001) and Roses (2002).

The yield parameters viz., number of pods per plant, pod per plot (g) and pod yield per hectare (kg ha⁻¹) were significantly higher with the treatments T10, T7 and T4 (Fig 4.4, 4.5 and 4.6 respectively). The maximum pod yield (Kg ha⁻¹) was significantly
higher with the treatment T10 followed by T7 and T4 and lowest with T1 control. Kazemi (2005), Sharma and Misra (1997), Tyagi (2003), Kumaran (2001) have also made similar observations in their studies.

Bio chemical parameter

Chlorophyll

Chlorophyll has been rightly designated as pigments of life because of their central importance in living systems responsible for harvesting sunlight and transforming its energy into biochemical energy essential for life on earth. In the present study, it was observed that the T10 recorded the maximum total chlorophyll content when compared to T1 control. Similar findings were reported by Wu-xiaoping (2004), Aishwath and Dravid (2004).

The available nitrogen, phosphorus and potassium in soil were significantly higher in treatment T10 and lower in treatment T1 control (fig 4.13 respectively). This is due to addition of combined bio fertilizer into the soil, which becomes more stable and increase biological activity in the soil and maintains the available NPK in the soil.
French bean (\textit{Phaseolus vulgaris})

The results obtained for French bean crop reveal that, the growth parameters like, plant height, number of branches, number of leaves, were significantly higher with the treatments T10 followed by T7 and T4 (Fig. 4.15, 4.16 and 4.17 respectively). The maximum plant height, number of branches and number of leaves were significantly higher with treatment T10 in all the stages of plant growth followed by T7 and T4 and lowest with T1 control. This is due to the application of growth promoting substances which increased photosynthetic activity and enhancement in mobilization of photosynthesis and change in the membrane permeability. The results of the investigation under study are in conformity with Das (2002), Jamwal (1989), Patel (1998), Singer (2000) and Mittal (2008).

The dry matter accumulation varied significantly due to bio fertilizer and chemical fertilizer at all the crop growth stages. The treatment T10 recorded significantly higher total dry matter production compared to control. This was due to higher dry matter production in leaf, stem and pod (Fig. 4.21, 4.22 and 4.23 respectively), there was due to translocation of photosynthates from leaf and stem to the pods at later stages. Similar results were reported by Olivera (2002), Dileep Kumar (2001) and Roses (2002).

The yield parameters viz., number of pods per plant, pod per plots (g) and pod yield per hectare (kg ha\(^{-1}\)) were significantly higher with the treatments T10, T7 and T4 (Fig. 4.18, 4.19 and 4.20 respectively). The maximum pod yield (Kg ha\(^{-1}\)) was significantly higher with the treatment T10 followed by T7 and T4 and lowest with T1.
control. Rajpal (2003), Khemchand and Meena (2004), Singh and Pareek (2003) have also made a similar observations in their studies.

**Bio chemical parameter**

**Chlorophyll**

In the present study, it was observed that the T10 recorded the maximum total chlorophyll content when compared to T1 control. Similar findings were reported by Wu-xiaoping (2004) and Rajendran *et al.* (2008).

The available nitrogen, phosphorus and potassium in soil was significantly higher in treatment T10 and lower in treatment T1 control (Fig 4.27 and fig 4.27 respectively). This is due to addition of combined bio fertilizer into the soil and as a conservance the soil becomes more stable and that enhances biological activity in the soil and maintains the available NPK in the soil.