

Formulated Fishpond biofertilizer pesticidal activities and its effect on growth of *Phaseolus vulgaris L.* (red kidney beans)

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Methods and Materials

This experimental study was carried out in the area of West Karachi Pakistan during May to September 2018. The temperature recorded at the beginning of experiment was 34°C and humidity at that time was 32% in May 2018 and temperature recorded 23°C and humidity was 22% in September 2018 at the end of experiment. On 16-May-2018, waste of fruits, vegetables and waste of ripe fruits and rotten vegetables were collected weight about 3000gram, dump into medium size of plastic container of about 15 inches in height and 8 inches in diameter, add 900gram fishpond sediment with it. All these waste are decomposed by microbes and convert into humus completely after 20 days. This compost were used with dry fishpond sediment weight about 1500gram. Both biofertilizers were dry weight about 4500gram. Prepare 10 pots of about 9 inches in height and 6 inches in diameter. Weight the soil (baalu mitti) for 3 different treatment ratios of biofertilizer and for control which is about 500gram for control, 750gram for 3 replicates of 1:3 ratio, 500gram for 3 replicates of 1:1 treatment ratio and 250gram for 3 replicates of 3:1 treatment ratio of biofertilizer. Weight biofertilizer(compost + fishpond sediment) for all replicates of 3 different treatment ratios of biofertilizer which is about 750gram for 3 replicates of 3:1 treatment ratio, 250gram for 3 replicates of 1:3 treatment ratio and 500gram for 3 replicates of 1:1 treatment ratio. For measuring pH level of soil. Take sample of soil weight about 15gram in 10ml distilled water and examine pH level by using soil pH testing kit.

Figure 2. Red kidney beans with formulated fertilizer

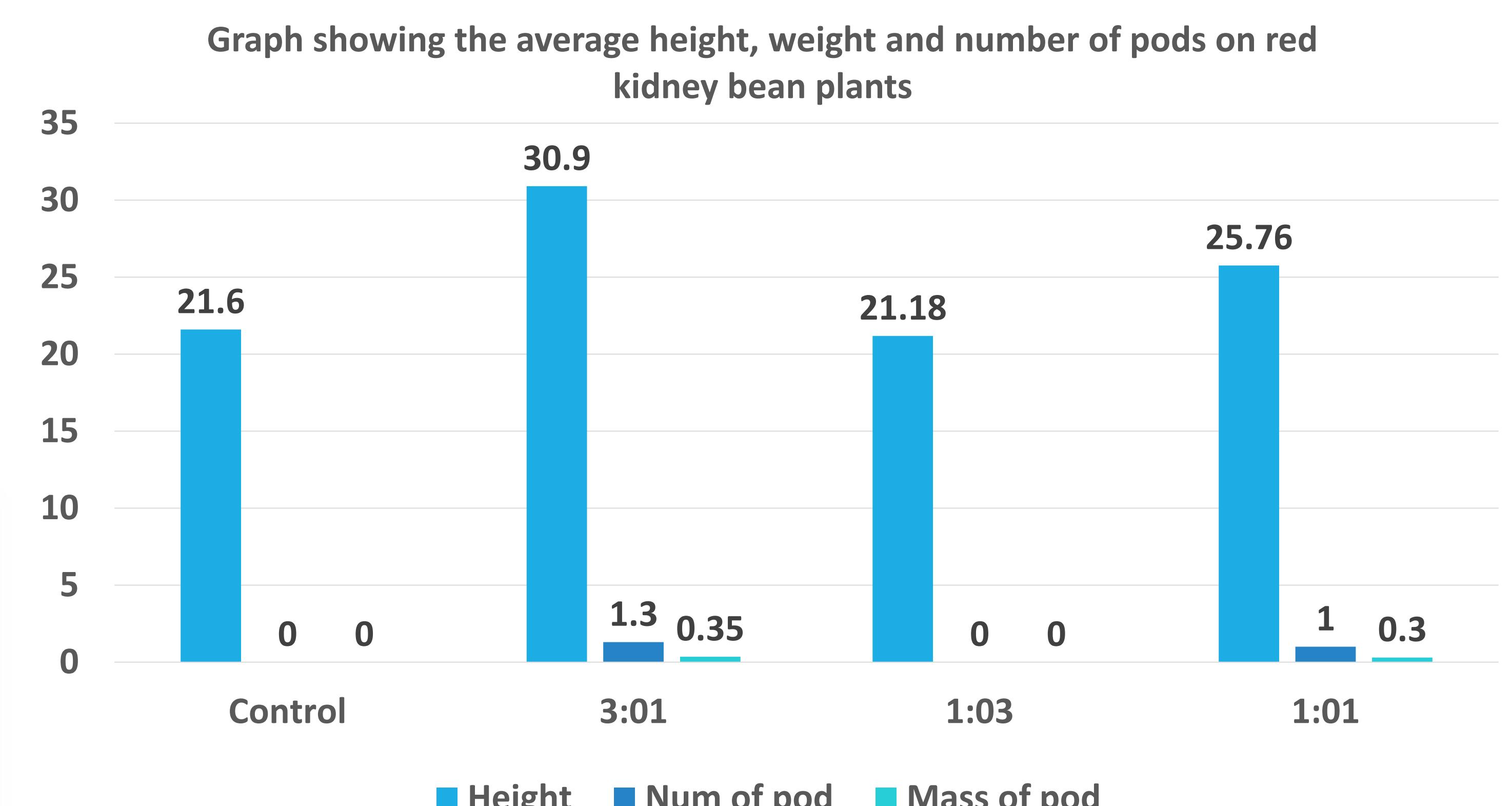


Results

In the present study we observed the growth of red kidney bean plants and their production of beans. The growth starts after 1 week in all replicates of 3:1 ratio of biofertilizer and in control about 7cm, 8cm, 6.3cm and 7cm respectively. In other 2 treatments biofertilizer (1:1, 1:3) growth was initiate within the same week but it slacken than 3:1 ratio of biofertilizer. The maximum growth of red kidney bean plants after completion of the experiment in all replicates of 3:1 treatment ratio of biofertilizer was about 42cm-53cm as compare to other treatment of biofertilizer and control. After 11th week we observed flowering on 3:1 and 1:1 treatment ratio, but flowering was not observed in control and 1:3 biofertilizer.

Infestation occurs in control and all replicates of 1:3 treatment ratio of biofertilizer. The growth was stopped in control after 2 months, all plants was damaged due pest. Pest infestation didn't occur in any replicates of 3:1 and 1:1 treatment ratio of biofertilizer and they also produced large number of red kidney beans pods on two replica of 3:1 treatment ratio.

Figure 1. Growth of red kidney beans



Discussion

The effect of biofertilizer or organic compost on different field crops has been recorded by various workers and got different result. In the previous study Igienon, et al. (2017: 4871-4881) used organic compost with 50% synthetic fertilizer for tomato production and recognized that the combine used of organic compost and chemical fertilizer was more effective on tomato production as compare to chemical fertilizer alone, whereas in the present study used biofertilizer which is a combination of organic compost and bottom soil of fish pond on the growth parameter of red kidney beans and got highest result as compare to control. Singh et al. (2017:113-134) recognized the combine effect of vermicompost and organic fertilizer on growth parameter of French bean and got highest weight, length of pods as compare to chemical fertilizer. In current experiment used biofertilizer which is a combination of organic compost and bottom soil of fishpond for growth of red kidney beans plant, showed highest shoot length, weight of pods and highest number of pods as compare to control. In 2018 Wang et al.(882-890) used organic fertilizer for squash production and got highest production of fruits and seed yield of squash.

Conclusions

The current study was conduct to evaluate the nutritional value of organic compost with fishpond sediment. The result obtained from the biofertilizer revealed that it has a positive effect on growth of plants and on pest infestation. It can be used as a substitute of chemical or synthetic fertilizer and cow dung. In-fact it has a beneficial and good effect on soil, crops as well as on environment amelioration. According to this study, kitchen and garden waste dump openly without carefully which creates polluted air especially in Karachi city. This waste also possesses large amount of nutrients which essential for plants growth. The sediments of fishpond contain rich amount of N and P which cause eutrophication under water body. The industries which made chemical fertilizers are also use large amounts of fuels, these burning fuels produce large amount of CO (carbon monoxide) which cause pollution in the environment. Biofertilizer is the best alternative source of chemical fertilizer due to their positive effects on soil condition, human health and environment for long period of time.

References

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