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Comparative Effect of Vermicast of Species *Eisenia fetida* on Plant *Prunus dulcis* over Inorganic Diet

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Abstract: Years back conventional farming methods got ruled out and newer inorganic chemical farming techniques came in existence with advent of science. With the drastic yield of inorganic diet and reduced efforts, techniques fetched the attention of commonest farmers and were brought in practice. Present study deals with feeding of plant *Prunus dulcis* with both organic and inorganic fertilizers. Effect of both fertilizers was checked with plant growth and number of leaves for a period of six months. The significant effect of it was found as organically fed plant showed both better growth and increased number of leaves proving significance of organic diet over inorganic diet of single super phosphate and urea.Organic diet of vermicast over produced by earth worm species *Eisenia fetida* over inorganic diet is beneficial for the plant species *Prunis dulcis* and enhances plant growth drastically and helps farmers to keep soil health equally in cost effective manner.

Keywords: *Conventional farming, inorganic fertilizers, organic fertilizers vermicast Eisenia fetida, , Prunus dulcis.*

1 Introduction

Generous nature of earth makes us affectionate towards it and its varieties. Plants are major components in biodiversity structure (Patel, 2014). Every day improving medical techniques have been increasing population in number day by day. The human population as a consequence have attained J-shaped population curve and is not any mode to get stabilized. With thirst to feed this ever increasing population farmers have developed various techniques one of the pioneer steps in the same was introduced by Norman Borlaug who is called as father of Green Revolution. Food production was increased during the times with development of modern varieties for many crops (*Evenson and Gollin 2003*). The different methods of green revolution are still being followed by farmers like: use of chemical fertilizers, chemical pesticides and newly introduced hybrid varieties and some genetically modified plants. Increasing demand on fertilized is related with rising demand of crop (*Quaik and Ibrahim 2013*). Though they yielded higher in least cultivation

areas but had many errors. Errors of such changed farming techniques have been highlighted in the present work. Since 1990 the market for organic food and products has grown rapidly and reached as high as $63 billion world over in 2012 (*Willeret al., 2013*).

The new agricultural techniques (inorganic farming) were though beneficial for short term had serious effects such as soil compaction, erosion, and declines in overall soil fertility (*Stinner, 2007*).Composting was one of the most known techniques of organic farming and involved different thermophiles(*Ndegwa and Thompson, 2001*). Vermicluture is a technique producing safe food through organic fertilizer both in quality and quantity (*Rekha G.S. et. al. 2013*) and has tremendous scope in recycling of residues of biological industries like agriculture (*Hemlatha, 2012*), animal drug (Singh et al. 2012), kitchen waste (*Bharadwaj A. 2010*) municipal solid waste (*Ananthakrishnasamy and Gunasekaran, 2014*; *Amaravathi and Reddy 2015*), sericulture (*Venugopal et al., 2010*), water hyacinth (*Patil et al. 2012, Zirbes et al. 2011*), paper mill solid waste (*Ponmani et al. 2014*).

Effects of vermicomposting on different plants have already been studied Ex: Vignaradiata (*Rajeshkumar and Ravichandran 2015*). Vermicomposting is a phenomenon of compost formation by the use of earthworms (*Gurav and Pathade 2011*). Vermicomposting is superior to composting as it is excellent and uniform process and takes place in faster duration of 75 days and also alters viability of nutrients significantly (*Thomas Hilari 2013*). Of these organic diets vermiwash obtained from earthworms is rich in bacteria, fungi and actinomycetes population (*Esakkiammal et. al. 2015*).

2 Materials and Methods

The present study on plant *Prunusdulcis* was done at Kanjara Tq. Aundha Dist. Hingoli. The co-ordinates of the place were 19035'N and 77013'E and has been placed at the elevation of 433m from M.S.L. (Mean sea level).Both plants inspected in the present study were *Prunusdulcis* also called as almond in local language. Of those one of the plant fed with inorganic and other with organic diet respectively for a time period of six months. The organic diet included vermiwash and vermicompost obtained from red earthworm species *Eisenia fetida* with the concentration of 10 gm vermicompost and 10ml of vermiwash every week.

The classification of earthworm was done based on Gates keys 1972. Whereas inorganic diet constituted single super phosphate and urea with 10gm each fed at every week. The plants were inspected for height and number of leaves at every fortnight from Aug 2015 to January 2016 and following results were obtained. Both the plants were placed at the distance of 10 meters away from each other insuring that there is no run off of nutrients from one plant base to other. Run off of nutrients was checked by the small grasses developed around the crop. The nutrients were applied at the base of plant near roots.

Inorganically fed crop

Organically fed crop

3 Results and Discussion

It was found that the plant fed with organic diet showed better growth and increased number of leaves compared to that fed with inorganic diet proving significant effect of usage of organic diet over inorganic diet to the plant *Prunusdulcis*. Taste, size and number of fruit will be the further part of the research in the same context.

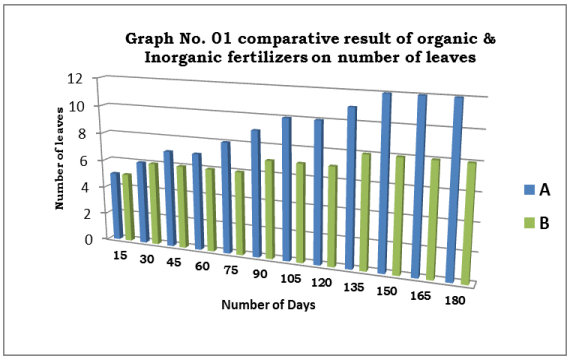
Discussion:

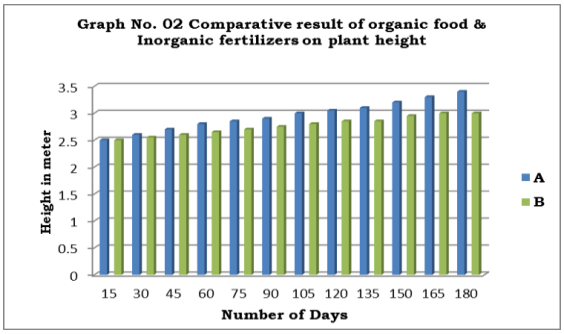
The growing concern for an ecologically sound agricultural system without pesticides has added new dimensions to the economics of bio dynamics. Reliance on organic matter sources is a central feature of organic agriculture. It involves the harnessing of soil organisms like bacteria, earthworms and other micro fauna in recycling organic wastes like straw, grass, leaves twigs, weeds etc. and their transformation to produce slow release nutrients as needed by the crop (*Cacco, G. and G. Dell'Agnola, 1984*).

Table1: Plant height and number of leaves against time in days.

Time in days	Plant height (meter)		Number of leaves	
	A*	B**	A	B
15	2.5	2.5	5	5
30	2.6	2.55	6	6
45	2.7	2.6	7	6
60	2.8	2.65	7	6
75	2.85	2.7	8	6
90	2.9	2.75	9	7
105	3.00	2.8	10	7
120	3.05	2.85	10	7
135	3.1	2.85	11	8
150	3.2	2.95	12	8
165	3.3	3.0	12	8
180	3.4	3.0	12	8

*plant A is fed with organic food which included vermiwash and vermicompost. ** plant B fed with inorganic nutrients urea and single super phosphate.





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The use of foliar fertilizer in agriculture has been a popular practice with farmers since

1950s. Growth and development events in plants are controlled by growth regulators. (Canellas, L.P. et al., 2000)

Bio-fertilizers (Vermiwash and vermicompost) contribute macronutrients and micronutrients in amount that is required by plants. According to (*Lalitha, R., K et al., 2000*), applications of organic fertilizers have an emphatic effect on plant growth and production. The soil enriched with vermicompost provides additional substances that are not found in chemical fertilizers (Kale, R.D. 1998 & Ansari, A.A. 2008).

The effects of vermicompost on plants are not solely attributed to the quality of mineral nutrition is provided but also to its other growth regulating components such as plant growth hormones and humic acids. Furthermore, the application of vermicompost in the field enhances the quality of soils by increasing microbial activity and microbial biomass which are key components in nutrient cycling, production of plant growth regulators and protecting plants soil-borne diseases and arthropod pest attacks.

4 Conclusions

Organic diet is much more effective over inorganic diet for both yield and cost effectiveness in production. The organic farming method is easier to follow and is easily conveyed to scientific community through the research paper and greenness does not extremely affected. More research should be investigated in more foods in order to better guide food preparation methods that preserve food of their rich bioactive components and antioxidant capacity

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