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Effect of organic nutrition practices on quality parameters of papaya (*Carica papaya* L.) under Precision farming technique

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Abstract
The present investigation has been revealed that "Effect of organic nutrition practices on quality of Papaya (*Carica papaya* L.) cv. Red Lady under Precision farming techniques". To determine the impact of different organic manures on quality parameters of papaya cv. Red Lady in a randomized block design with twelve treatments and three replications during the year of 2019-2020 at the site of horticultural field of Precision Farming Development Centre, IGKV, Raipur. Fruit quality parameter such as maximum total soluble solid (TSS) was observed with the application of 80% RDF, Vermiwash (1 L), Cow urine (1L), Neem seed extract (1L) per plant. The minimum acidity of papaya fruits observed with application of vermiwash, cow urine, neem seed extract. The maximum seed: flesh ratio and shelf-life was reported highest in application of combined organic manures 80% RDF, Vermiwash (1 L), Cow urine (1L), Neem seed extract (1L) per plant.

Keywords: Neem seed extract, cow urine, vermiwash, Mahua cake, organic manures, papaya

Introduction
Papaya (*Carica papaya* L.) is basically a tropical fruit and commercially developed in tropical and subtropical zones. It is one of the important natural product crops which discover an vital put in homestead cultivate beneath different eco-climatic condition (Singh *et al*., 2012). It is wealthy in carotene, vitamin A, thiamin, riboflavin, minerals and a number of Proteolytic chemicals. It can be expended as mature natural fruit as well as vegetable. Its range of cultivation under development is expanding with time due to its high nutritious value and high yield potential. (Nayak *et al*. 2015) [1]. Papaya is a backyard fruit crop which has become an important commercial fruit crop beside these years for these pharmaceutical, medicinal and nutritional values. Although its quick and continuous growing habit increasing the early yearly income of papaya growers. High yielding varieties of papaya requires critical nutrient management practices due to its continuous growth flowering and fruiting habits. (Shivkumar 2012) [2]. Organic cultivating is getting to be progressively popular, with a quickly developing worldwide request for natural organic products. It offers significant benefits over conventional farming systems especially with regard to feasible yield, better quality and wellbeing danger free deliver of produce. Fruits, eaten as raw, are more helpful to contamination with chemicals due to the latter's leftover poisonous quality as compared to cereals and pulses. In this way, the organic cultivation of papaya fruits is gaining popularity over that of other fruit crop groups. (Reddy *et al*. 2010) [6]. For sustainable agriculture use of organic manure provide the nutritional requirement of papaya fruit crop since, organic manures improves the biological, physical and chemical properties and also improves the moisture holding capacity and thus maintaining the quality of crop produce along with increasing the crop productivity. For maintaining the agricultural production capacity remain productive then maintain the soil fertility and increases the use of biologically active compound prepared from human and animal, increasing biodiversity generally used by farmers for sustainable higher production. (Premsekhar and rajshree, 2009).

Materials and Method
The field trial was conducted during 2019-2020 at horticultural research farm Precision Farming Development Centre. In a randomized block design with twelve treatment and three replications. The seedlings of papaya cv. Red Lady procured from college of agriculture and research station Bemetara. The experimental seedlings of papaya planted at a distance of 1.8x

1.8 m and cultivated using package of practices. The treatment consisted twelve different combination of organic nutrients along with biofertilizer and recommended dose of fertilizers *viz.* T_1: RDF + Control, T_2: RDF(80%) + 3 kg Vermi-compost /plant, T_3: RDF(80%) + 1 kg Neem Cake /plant, T_4: RDF(80%) + 1 kg Madhuka cake /plant, T_5: RDF(80%) + 1 L Vermiwash /plant, T_6: RDF(80%) + 1 L Cow urine/Plant, T_7: RDF (80%)+ 1 L Neem seed extract /plant, T_8: RDF(80%) + 50 g PSB/plant, T_9: RDF(80%) + 20 ml Pseudomonas straita /Plant, T_{10}: RDF (80%) + Vermiwash + Cow urine, T_{11}: RDF(80%) + Vermiwash + Neem seed extract, T_{12}: RDF(80%) + Vermiwash (1 L) +Cow urine (1L) + Neem seed extract (1L).

Result and Discussion

Results of the experiment revealed that the quality attributing characters of papaya like total soluble solid (16.82%) was recorded highest in T_{12} (80% RDF+ Vermiwash+ Neem seed extract+ cow urine) significantly superior over the other treatments. In T_1 (RDF + Control) a minimum total solid percentage was noted which is (10.34%) followed by T_9 (11.52%). The treatment is T_{12} (80% RDF + vermiwash (1L)+ cow urine (1L)+ neem seed extract (1L)/Plant), recorded minimum percent of acidity (0.132%).. The maximum acidity percent (0.181%) was noticed under control (T_1). During the ripening of the fruits, the carbohydrate reserves of the root and stem are densely withdrawn and hydrolyzed into sugars thus resulting in a better quality of the fruit, the results are in agreement with Rekha eda *et al*. (2018) in papaya. Among the all treatment maximum seed to flesh ratio (40.05) was observed under treatment T_{12} (RDF (80%)+Vermiwash(1L) + cow urine(1L)+ neem seed extract(1L)), which was followed by T_{11} which had (34.74) seed to flesh ratio. Data show that different organic nutrients have had a significant effect on Shelf life of papaya fruit under different treatments. Considerably higher Shelf life was observed under treatment T_{12} (8.08 days) which was statistically at par with treatment T_{11} (7.00 days), while, the minimum shelf life (5.15 days) was found under treatment T_1 (RDF+ control).

Table 1: Effect of organic manures on quality parameters of papaya (*Carica papaya* L.)

Treatments	Total Soluble Solid (%)	Acidity (%)	Seed: flesh ratio	Shelf- life (days)
T_1: RDF + Control	10.34	0.181	13.89	5.15
T_2: RDF(80%)+ vermicompost(3kg/plant)	13.71	0.165	17.15	6.12
T_3: RDF(80)+ neem seed extract(1kg)	12.77	0.170	17.61	5.88
T_4: RDF(80%)+ madhuka cake(1kg)	12.32	0.172	17.83	5.82
T_5: RDF(80%) + vermiwash(1lt)	14.87	0.153	21.81	6.29
T_6: RDF(80%) + cow urine(1lt)	15.37	0.149	25.94	6.32
T_7: RDF(80%) + neem seed extract(1lt)	14.67	0.154	21.16	6.28
T_8: RDF(80%) + PSB(50g)	14.35	0.164	18.55	6.14
T_9: RDF(80%)+Pseudomonas straita @20g culture /plant	11.52	0.178	14.72	5.67
T_{10}: RDF(80%) +vermiwash +cow urine	15.84	0.145	32.63	6.42
T_{11}: RDF(80%)+ Vermiwash+ Neem seed extract	16.23	0.133	34.74	7.00
T_{12}: RDF(80%)+Vermiwash(1L) + cow urine(1L)+ neem seed extract(1L)	16.82	0.132	40.05	8.08
SE(m)	0.61	0.004	0.44	0.60
CD (p=0.05)	1.81	0.012	1.30	1.75

Conclusion

The following conclusions can be drawn from this experiment. Treatment T_{12} (RDF (80%) + Vermiwash (1 L) +Cow urine (1L) + Neem seed extract (1L), performed better than the other treatments followed by treatment T_{11} (80% RDF+ Vermiwash + neem seed extract).

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