The Pharma Innovation Journal 2022; 11(3): 1809-1810

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 1809-1810

www.thepharmajournal.com
Received: 11-01-2022
Accepted: 16-02-2022

Rajni Banjare
Department of Fruit Science, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Dr. GD Sahu
Department of Fruit Science, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Gulshan Khatterjee
Department of Fruit Science, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Corresponding Author:
Rajni Banjare
Department of Fruit Science, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

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

Rajni Banjare, Dr. GD Sahu and Gulshan Khatterjee

Abstract
A field experiment was conducted to "Effect of organic nutrition practices on yield parameters of papaya (*Carica papaya* L.) Under Precision farming techniques." during the year 2019-2020 at Horticulture Research Farm, Precision Farming Development Centre (PFDC) IGKV, Raipur (Chhattisgarh). The experiment was laid out in a randomized block design with twelve treatments combinations and three replications. The plant height, petiole length, stem girth, initiation of flowering, number of fruits, fruit weight, yield plant^{-1} and yield ha^{-1} increased with application of organic manures like vermicompost, neem cake, cow urine, neem seed extract, vermiwash, PSB and pseudomonas etc. Highest fruit yield plant^{-1} (63.72kg plant^{-1}) was recorded in combination of manures like vermiwash, cow urine and neem seed extract. Under experiment highest fruit yield ha^{-1} was recorded in 80% RDF using vermiwash, cow urine and neem seed extract (194.41 t ha^{-1}) and lowest fruit yield ha^{-1} was found in conventional system.

Keywords: Organic manure, papaya, vermiwash, neem seed extract, cow urine

Introduction
Papaya (*Carica papaya* L.) is one of the most important tropical fruit crops of India ranks after mango, banana, and citrus. It belongs to the family Caricaceae, which comprises of 20 species in six genera. Badillo (2000) [3] placed papaya as a monotypic genus transferring its 22 closest relatives to an older taxon, Vasconcellea. Papaya is originated in Mexico as a cross between two species of the genus *Carica*. It was introduced to India during 16th century from Malacca (Kumar and Abraham, 1943) [3]. Papaya is a polygamous species, which have three basic sex, staminate (male), pistillate (female), and hermaphrodite (bisexual). Out of these only female is stable and flowers of male and hermaphrodite vary in sex expression under different climatic situations (Litz, 2005) [7]. The mature fruits of papaya are green to dark green in colour and changed to yellow orange on ripening or red depending on cultivars. Immature fruits of papaya are the rich source of papain and proteolytic enzymes, which are helpful in digestion of protein and used as meat tenderizer (Ram, 1996) [8]. Papaya fruit crops mainly grown as a filler plant in different orchards and it is also grown in kitchen garden, backyard of home, around the cities and big towns (Chadha, 1992) [2]. Therefore, use of balanced nutrition like organic, bulky organic manures and biofertilizers increase the plant growth, yield and fruit quality. Application of balanced nutrient at nursery level and planting in the main field plays a major role during production and productivity of papaya. Papaya fruit crop has tremendous yield potential due to heavy bearing and indeterminate growth habit with simultaneous vegetative growth, flowering and fruiting. It is known for medicinal and high nutritive value. Papaya is a very remunerative crop and heavy feeder, due to this adequate application of manure in young and mature plants is essential to maintain the growth, quality of fruits and vigour of the plants to obtain regular high yields. (K Singh Kirad). Papaya is a shallow rooted fruit crops, in papaya soil microflora and organic amendments plays a major role in soil health, plant growth and productivity. Phosphate solublizer, PSB and nitrogen fixing bacteria are major biofertilizer for horticultural fruit crops. The contribution of biofertilizers like PSB, Azotobacter in increasing the plant growth quality, yield of fruit crops and in reducing the fertilizer requirement in fruit crops. Phosphate solublising microorganism solublize the unavailable forms of inorganic phosphorous into soluble forms by releasing of organic acid like fumaric, succinic, gluconic, citric, glyoxalate, and malic acids (Mamta).

Materials and Methods

A Field experiment was carried out at Research field of Precision Farming Development Centre (PFDC), Department of Fruit Science (Horticulture), IGKV, Raipur (C.G.) during the year 2019-2020. The experiment was conducted in Randomized Block Design with three replications and twelve treatments combinations. The experimental plots were treated with 80% RDF and different organic manures consisting of vermicompost, neem seed extract, neem cake, madhuka cake, cow urine, vermiwash and biofertilizers like PSB, Pseudomonas. Fourty five days old seedlings of papaya were transplanted in 60 x 60 x 60 cm pit with keeping row to row and plant to plant spacing 1.8x 1.8 m.

Results and Discussion

Data on yield parameters revealed that the maximum number of fruits per plant (71.82) registered the maximum values when fertigated with 80% RDF + Vermiwash + Neemseed extract +cow urine, compared to conventional methods of fertilizer application. Though the number of fruits per plant more in T_{12} (71.82) followed by T_{11} (69.49), T_{10} (68.43). T_6 (66.12) and T_5 (65.72) respectively. They were statistically at par to each other. The control T_1 had recorded the lowest fruits per plant (49.73) which was at par to number of treatments *viz*. T_9 (51.64). Maximum fruit weight (1285.43 g) was observed high in appliances with 80% RDF+ Vermiwash + Neemseed extract+ cow urine (Table.1). Followed by T_{11} and T_{10} with an average fruit weights of 1271.94 and 1264.11 g, respectively. Treatment T_5 & T_7 and T_2 & T_3 with fruit weights of 1042.73 & 1024.75 and 961.29 & 952.64 g recorded statistically similarity to each other. Whereas minimum weight of fruit was recorded in T_1 (899.37 g). The increase in higher fruit weight and number of fruits per plant (71.82) resultant total fruit yield per plant (63.72 kg plant^{-1}). The highest fruit yield ha^{-1} (194.41t ha^{-1}) was recorded under treatment T_{12}.

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

Treatments	No. of fruits	Fruit weight (g)	Fruit yield per plant (kg)	Fruit yield (tones/ha)
T_1: RDF + Control	49.73	899.37	38.38	118.44
T_2: RDF(80%) + Vermicompost (3kg/plant)	55.34	961.29	46.75	144.27
T_3: RDF(80) + neem seed extract (1kg)	54.83	952.64	45.41	140.13
T_4: RDF(80%) + madhuka cake (1kg)	53.3	935.47	43.65	134.70
T_5: RDF(80%) + vermiwash (1lt)	65.72	1042.73	53.72	165.77
T_6: RDF(80%) + cow urine(1lt)	66.12	1160.75	56.34	173.86
T_7: RDF(80%) + neem seed extract(1lt)	58.35	1024.75	51.49	158.89
T_8: RDF(80%) + PSB(50g)	56.57	991.04	49.73	153.46
T_9: RDF(80%)+Pseudomonas straita @20g culture/plant	51.64	910.17	40.36	124.55
T_{10}: RDF(80%) + vermiwash + cow urine	68.43	1264.11	58.72	181.20
T_{11}: RDF(80%) + Vermiwash + Neem seed extract	69.41	1271.94	60.16	185.65
T_{12}: RDF(80%) + Vermiwash (1L) + cow urine(1L) + neem seed extract (1L)	71.82	1285.43	63.72	194.41
SE(m)	1.44	18.86	0.51	0.52
CD (p=0.05)	4.27	55.67	1.48	1.53

References

1. Badillo VM. Carica VS. Vasconcellea St. Hill. (Caricaceae) con la rehabilitacion de este ultimo. Ernstia. 2000;10:74-79.
2. Chadha KL. Scenario of papaya production and utilization in India. Indian J of Hort. 1992;49(2):97-119.
3. Kumar LSS, Abraham A. The papaya its botany, culture and uses. J. Bombay Nat. His. Soc. 1943, 5.
4. Singh Kirad K, Barche S, Singh DB. Integrated Nutrient Management in Papaya (*Carica papaya* L.) cv. Surya. Proc. IInd IS on Papaya Eds.: N. Kumar *et al*. Acta Hort. 851, ISHS, 2010.
5. Lakshmi Devi B, Siva Rama Krishna VNP, Madhumathi C, Yuvaraj KM, Sireesha Y, Rama Krishna M. Organics and bio- fertilizers effect on germination process of papaya at nursery lavel (*Carica papaya* L.) Journal of Pharmacognosy and Phytochemistry. 2019;8(1):2425-2427.
6. Litz RE. Biotechnology of fruits and nut crops. CABI Publishing, CAB International, Wallingford, Oxfordshire OX108DE, UK, 2005.
7. Mamta. Effect of inoculation of azotobacter and phosphate solubilizing bacteria on growth performance of papaya seedlings. M.Sc. (Ag.) Thesis, Indira Gandhi Krishi Vishawavidyalaya, Raipur, 2017.
8. Ram M, Sharma SD. Uniformity trial on papaya. International Conference on Tropical Fruits, Malaysia, 1996, 50-51.