Eco. Env. & Cons. 30 (1) : 2024; pp. (345-347)
Copyright@ EM International
ISSN 0971–765X

DOI No.: http://doi.org/10.53550/EEC.2024.v30i01.062

Impact of Different Organic Manures on the Yield Attributes of Colocasia (*Colocasia esculenta* L.) Cv. Muktakeshi

Sarita Gurjar[1], Virendar Singh[2], Surbhi Prithiani[3] and Deepika Ujjawal[4]

Department of Horticulture, R.C.A., MPUAT, Udaipur, Rajasthan, India

(Received 17 August, 2023; Accepted 1 December, 2023)

ABSTRACT

To investigate the impact of organic nutrient management in colocasia (*Colocasia esculenta* L.), a field experiment was carried out during *kharif*, 2021–2022, at Rajasthan College of Agriculture, MPUAT, Udaipur. In which, eight treatments and three replications were taken and the results depicted that the treatment T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through vermicompost) have significantly maximum values for yield characters such as corm weight (109.33 g), cornel weight (21.86 g), corm yield plant^{-1} (0.109 kg), cormel yield plant^{-1}(0.374 kg), total yield (17.89 t ha^{-1}), however T_7 (½ RDF through NADEP + ½ RDF through vermicompost) have maximum values for number of cormelplant^{-1} (17.34). Among various treatment combinations T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through vermicompost) was found maximum for net return (382073 Rs. ha^{-1}) and B:C ratio (2.47).

Key words: *FYM, NADEP, Vermicompost*

Introduction

Colocasia esculenta L., sometimes known as taro or elephant ear in English, is a significant tuber vegetable grown around the world. Colocasia is a historically significant and useful root crop that belongs to the monocotyledonous family Araceae. The family has around 2500 species spread across about 110 genera. Usually grown for its starchy, sweet-tasting corms, it is a perennial herbaceous plant that is native to the subtropics or the tropics. Many regions in the world grow colocasia roots, sometimes referred to as dasheen and eddoe. Its primary constituents are long-petioled leaves that emerge in a whorl from the apex of the underground corms. Corms have few side tubers, short internodes, and a cylindrical shape. Colocasia is also grown as an ornamental plant. It is mainly cultivated for its fleshy corms and cormels, though all plant parts are consumed i.e., the leaves, petioles, corms and cormels. After being strained, the pressure-cooked taro corms are left to ferment, producing "poi," an acidic byproduct.

Good quality protein, digestible starch, vitamin C, thiamine, riboflavin, niacin, and necessary amino acids are all present in colocasia. The crop is also extremely high in nutritional fiber, making it useful for treating conditions including obesity, diabetes, cancer, and gastrointestinal disorders. (Mukharjee *et al.,* 2016).

Materials and Method

The experiment was conducted during *kharif* season of the year 2022-23 at the Horticulture Farm, Depart-

([1,4]M.Sc.Research Scholar, [2]Associate Professor, [3]Ph.D. Research Scholar)

ment of Horticulture, Rajasthan College of Agriculture, MPUAT, Udaipur, which is situated at 74° 42' E longitude and 24° 35' N latitude with an altitude of 581.13 m above mean sea level. The experiment included eight treatment combinations, *i.e.* T_1(Control), T_2(RDF through FYM), T_3 (RDF through Vermicompost), T_4 (RDF through NADEP compost), T_5 (½ RDF through FYM + ½ RDF through NADEP), T_6 (½ RDF through FYM + ½ RDF through Vermicompost), T_7 (½ RDF through NADEP + ½ RDF through Vermicompost), T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through Vermicompost). They were under taken in randomized block design with three replications. Observations were recorded at 120 days after planting (DAP) for various parameter like corm weight (g), cormel weight (g), corm yield plant^{-1} (kg), cormel yield plant^{-1}(kg), total yield (t ha^{-1}), number of cormel plant^{-1}, cost of cultivation (Rs. ha^{-1}), gross return (Rs. ha^{-1}), net return (Rs. ha^{-1}) and B: C ratio.

For the experiment variety Muktakeshi was used and for organic nutrient management FYM, vermicompost and NADEP were used with nutrient composition of (0.5:0.25:0.50); (1.8:0.28:0.30) and (1.5:0.9:1.4), respectively. Field contains total 24 plots in number with plant spacing of 60 cm X 45 cm for R X P.

Results and Discussion

Effect of various levels of FYM, NADEP and Vermicompost on yield attributes

The effect of FYM, NADEP and vermicompost were observed significant on yield attributes of colocasia. In Table 1. the maximum corm weight (109.33 g), cormel weight (21.86 g), corm yield per plant (0.109 kg), cormel yield per plant (0.374 kg) and total yield (17.89 t ha^{-1}) recorded for treatment T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through vermicompost), while maximum number of cormels (17.34) was recorded for T_7 (½ RDF through NADEP + ½ RDF through vermicompost), whereas minimum corm weight (61.20 g), cormel weight (17.06 g), number of cormels (13.17), corm yield per plant (0.061 kg), cormel yield per plant (0.224 kg) and total yield (10.57 t ha^{-1}) were recorded for T_1 (Control). It was found that increase in yield was due to the combined application of FYM, NADEP and vermicompost which releases nutrients in available form. The reason behind the result must be due to nutrient concentration in the soil was enhanced by the particular combination of various organic manure in comparison with other manure combination. The higher nutrient in soil is linked to the increased tuber yield. Similar findings are also reported by Suja *et al*. (2009) tannia (*Xanthosomasagittifolium* L.), Reddy *et al*, (2017) in chilli, Brar *et al*. (2015), Degwale (2016) and Dhaker *et al*. (2017).

Effect of various levels of FYM, NADEP and Vermicompost on economics of Colocasia

The economics of colocasia production is very important part of cultivation for higher profits and less cultivation cost are advantageous traits for getting higher returns. In Table 2. economic analysis showed that the highest gross return (536700 Rs. ha-

Table 1. Effect of organic nutrient management on yield attributes of colocasia.

Treatments	Corm weight (g)	Cormel weight (g)	Number of cormel per plant	Corm yield per plant (kg)	Cormel yield per plant (kg)	Total yield (t ha^{-1})
T_1 (Control)	61.20	17.06	13.17	0.061	0.224	10.57
T_2 (RDF through FYM)	72.15	18.50	14.39	0.071	0.266	12.51
T_3 (RDF through Vermicompost)	72.23	20.17	15.03	0.072	0.303	13.88
T_4 (RDF through NADEP compost)	63.37	18.71	13.23	0.063	0.247	11.51
T_5 (½ RDF through FYM + ½ RDF through NADEP)	91.27	19.36	16.42	0.091	0.317	15.13
T_6 (½ RDF through FYM + ½ RDF through Vermicompost)	98.83	20.03	15.91	0.098	0.318	15.45
T_7 (½ RDF through NADEP + ½ RDF through Vermicompost)	102.17	20.33	17.34	0.101	0.352	16.83
T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through Vermicompost)	109.33	21.86	17.13	0.109	0.374	17.89
SE(m)±	1.11	0.28	0.22	0.001	0.01	0.25
CD(P=0.05)	3.65	0.85	0.67	0.003	0.02	0.74

Table 2. Effect of organic nutrient management on net return and B:C of colocasia

Treatments	Total Yield (t ha^{-1})	Cost of cultivation (Rs. ha^{-1})	Gross return (Rs. ha^{-1})	Net return (Rs. ha^{-1})	B:C
T_1 (Control)	10.57	133500	317100	183600	1.38
T_2 (RDF through FYM)	12.51	153500	375300	221800	1.44
T_3 (RDF through Vermicompost)	13.88	166830	416400	249570	1.50
T_4 (RDF through NADEP compost)	11.51	143550	345300	201750	1.41
T_5 (½ RDF through FYM + ½ RDF through NADEP)	15.13	148525	453900	305375	2.06
T_6 (½ RDF through FYM + ½ RDF through Vermicompost)	15.45	160165	463500	303335	1.89
T_7 (½ RDF through NADEP + ½ RDF through Vermicompost)	16.83	155190	504900	349710	2.25
T_8 (1/3rd RDF through FYM + 1/3rd RDF through NADEP + 1/3rd RDF through Vermicompost)	17.89	154627	536700	382073	2.47

*Selling price of colocasia 30 Rs. per kg.

^{1}), net returns (382073 Rs. ha^{-1}) and benefit cost ratio (2.47) were recorded for treatment T_8(1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through vermicompost), whereas lowest gross return (317100 Rs. ha^{-1}), net returns (183600Rs. ha^{-1}) and benefit cost ratio (1.38) were recorded for treatment T_1 (Control). Similar findings are also supported by Premsekhar and Rajshree (2009) who studied on influence of organic manures on growth, yield and quality of okrawith eleven treatments and reported with the BC ratio of 3.56.

Conclusion

The present investigation entitled "Effect of Organic Nutrient Management in Colocasia (*Colocasia esculenta* L.)" was carried out during *kharif* season 2022-23 with the principal purpose. It is concluded from the present investigation that combined application of FYM, NADEP and vermicompost as organic manures improved the performance of colocasia in term of yield and economics as compared to control. Among the all treatment combination application of T_8 treatment (i.e. 1/3rd RDF through FYM + 1/3rd RDF through NADEP +1/3rd RDF through Vermicompost) can be recommended to colocasia growers for obtaining better yield, net return and B:C ratio.

Acknowledgement

The author is thankful to guide, committee members and the Head of department of horticulture, Rajasthan college of Agriculture, MPUAT, Udaipur for providing field and laboratory facilities and to carry out this study. This research would not have been possible without the inspiration and support of all the wonderful individuals.

Conflict of interest statement

The author declares that there is no conflict of interest.

References

Brar, R.K., Sharma, R. and Kaur, J. 2015. Effect of organic sources of nutrients on yield and quality of onion (*Allium cepa* L.). *Indian Journal of Ecology.* 42: 266-267.

Degwale, A. 2016. Effect of vermicompost on growth, yield and quality of garlic (*Allium sativum* L.) in EnebseSarMidir District, North-western Ethiopia. *Journal of Natural Science Research*. 6: 51-63.

Dhaker, B., Sharma, R.K., Chhipa, B.G. and Rathore, R.S. 2017. Effect of different organic manures on yield and quality of onion (*Allium cepa* L.). *International Journal of Current Microbiology and Applied Sciences.* 6: 3412-3417.

Mukherjee, D., Roquib, Md., A., Das, N.D. and Mukherjee, S. 2016. A study on genetic variability, character association and path co-efficient analysis on morphological and yield attributing characters of taro (*Colocasia esculenta* L.). *American Journal of Plant Sciences.* 7: 479-488.

Reddy, G.C., Venkatachalapathi, V., Reddy, G.P.D. and Hebbar, S.S. 2017. Study the effect of different organic manure combination on growth and yield of chilli (*Capsicum annuum* L.). *Plant Archives*. 17: 472-474.

Suja, G., Susan John, K. and Sundaresan, S. 2009. Potential of tannia (*Xanthosomasagittifolium* L.) for organic production. *Journal of Root Crops*. 35: 36-40.