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Efficacy of Organic Fertilizer on the Growth and Yield of (Luffa acutangula) Ridge Gourd Based on Cow Products

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Abstract- **Organic farming is gaining importance in the modern agriculture. Organic agriculture is a system that relies on safe ecosystem management rather than external agricultural inputs. It is adopted with a blend of ecologically safe modern technologies which are acceptable to the farmers. Different kinds of cow based liquid organic manure such as Panchagavya, Sanjibani, Kunapajala, Jeevamrutha, Beejamrutha, Amritpani etc., The organic liquid products such as Panchagavya, Jeevamrutha, and Beejamrutha which are eco-friendly organic preparations made from cow products .The use of liquid products such as Panchagavya, Jeevamrutha, and Beejamrutha significantly increases the growth, yield and quality of crops. These liquid organic solutions are prepared from cow dung, urine ,milk, curd, ghee, legume flour and jaggery. Locally available products become more effective fertilizer after fermentation. In this study, Panchagavya, Beejamrutha and Jeevamrutha are used in different concentrations and different combinations. In this, there are six different concentrations is used to treat the ridge gourd plant .Beejamrutha and Jeevamrutha is used in two different concentrations such as T1 T2. Panchagavya, Beejamrutha and Jeevamrutha combinations also used as a fertilizer the treatments are T1,T2,T3,T4. The present study reveals that there is a significant increase in the growth and yield parameters of ridge gourd.**

Keywords: Beejamrutha, Jeevamrutha, cow products

INTRODUCTION

Nowadays , organic farming is gaining importance due to realization of inherent advantages and nutrient dynamics. As it confers in sustainability in agroecosystems involves environmently friendly techniques based on biological and devoid of chemical methods .organic farming is an advance system approach which follows principles and logics of living organisms in which all elements i,e.soil, plants, animals,microorganisms,insects,the farmers etc.,are closely linked with each other. It works in harmony with nature. Organic agriculture is a system that relies on ecosystem management rather than external agricultural inputs.(Subbarao et al.,2007)Organic farming is not a new concept to india and traditionally Indian farmers are organic,but gradually changed to chemical based cultivation due to the rapid plant growth and immediate action against pest attack,weeds etc. In recent years number of organic farming systems emerged as an alternative to modern agriculture with some positive impact.The Panchagavya,Beejamrutha and Jeevamrutha are ecofriendly organic preparation made from cow products. The use of organic liquid products such as Panchagavya, Beejamrutha and Jeevamrutha results in higher growth,yield and quality of crops(Gore,2010).Panchagavya is one such concoction where cow dung and cow urine is allowed to ferment with a host of other ingredients all sourced from locally available materials.Beejamrutha was prepared using the ingredients cow dung,urine,jaggery,lime and turmeric powder. Jeevamrutha was prepared by cow urine,dung,gram flour,jaggery and water. These component are allowed to ferment according to the required period for every fertilizer. Panchagavya is good to be used for minimum six months but Beejamrutha and Jeevamrutha are used within a week Panchagavya is known to increase farm yield and boost immunity. Beejamrutha and Jeevamrutha are used as a enhancer for the plant growth and yield of crops. Ridge gourd belongs to the cucurbitaceae family. To study the efficacy of these liquid organic fertilizer on ridge gourd in different concentration.

MATERIALS AND METHODS

Panchagavya,Beejamrutha and Jeevamrutha were used as a fertilizer in six different concentration. In this , Beejamrutha and Jeevamrutha are used to prepare two different concentrations such as T1,T2 .The combination of these three liquid fertilizer are diluted to prepare four concentration likeT1,T2,T3,T4.Using these fertilizer, field experiment was done to treat the ridge gourd.

METHODS OF PREPARATION

To prepare Panchagavya ,firstly add cow dung and cow ghee is added to the plastic drum and covered with a white mesh placed under a shade. After 3rd day of preparation add the

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remaining component to the drum. Regular stirring is very important after sun dawn and before sun dusk. On the 21st day of preparation panchagavya is ready to use. Beejamrutha was prepared using cow dung,urine,jaggery,lime and turmeric powder. Jeevamrutha was prepared by adding cow dung, cow urine, gram flour,jaggery and required amount of water. Stir the content regularly thrice in a day. The fermentation process improves the fertilizer.

FIELD PREPARATION FOR VEGETABLE CULTIVATION

Luffa acutangula is cultivated throughout the year. It is originated from India and belongs to the cucurbitaceae family. Field experiments were conducted at courtallam near tiger falls. The ridge gourd was cultivated in the field. In this, totally six concentration and one act as control without any fertilizer. In this ,40 seeds were chosen for every concentration. In each concentration, there were 8 pits were prepared .The seeds were soaked for overnight in B+J and P+B+J.The ridge gourd seeds were sown in dibbling method at 1.5m*1.0m*1.5m.The concentration ratio for every concentration are shown in Tab.1. After germination, use this fertilizer as a foliar spray for every 10 days of interval. 5 plants were chosen to known for the growth parameters for every 10 days interval after the germination.

STATISTICAL ANALYSIS

The experimental results were performed in five and the data are presented as Mean ±SE. The results were compared by one-way ANOVA using 21.0

Table.1: Dilution ratio for different concentration

TREATMENT	PANCHAGAVYA	BEEJAMRUTHA	JEEVAMRUTHA	WATER
CONTROL	----------	----------	----------	----------
T1	----------	2%	20%	780ML
T2	----------	4%	25%	710ML
T3	1.5%	1%	10%	875ML
T4	2.0%	1.5%	15%	815ML
T5	2.5%	2%	20%	755ML
T6	3.0%	2.5%	25%	695ML

Table.2Germination percentage of ridge gourd

S.NO	TREATMENT	GERMINATION(%)
1.	C0NTROL	82.5
2.	(T1)	87.5
3.	T2	95
4.	T3	92.5
5.	T4	92.5
6.	T5	97.5
7.	T6	95

Table.3 Growth parameters of *Luffa acutangula* in 10 days

TREATMENT	PLANT HEIGHT	ROOT LENGHT	SHOOT LENGHT	No.of LEAVES
C	8.7±0.14	3.4±0.14	5.3±0.17	4.4±0.51
(T1)	11.6±0.10	3.6±0.15	7.9±0.13	4.4±0.44

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T2	20.4±0.13	8.3±0.15	12.2±0.11	7.2±0.37
T3	18.4±0.16	7.5±0.11	10.8±0.10	5.6±0.24
T4	17.8±0.14	7.7±0.15	10.1±0.13	5.8±0.37
T5	19.6±0.14	8.2±0.15	11.4±0.10	7.6±0.37
T6	19.3±0.13	8.1±0.12	11.2±0.11	7.4±0.24

Table.4 Growth parameters of *Luffa acutangula* in 20 days

TREATMENT	PLANT HEIGHT	ROOT LENGHT	SHOOT LENGHT	No.of LEAVES
C	18.7±0.18	7.8±0.19	10.9±0.15	10.6±0.40
(T1)	33.6±0.13	16.7±0.11	17.0±0.11	10.6±0.40
T2	61.5±0.15	24.7±0.13	36.8±0.13	16.2±0.37
T3	45.0±0.09	23.6±0.09	21.4±0.11	13.6±0.24
T4	58.4±0.15	23.1±0.13	35.2±0.13	14.0±0.44
T5	61.4±0.14	24.1±0.12	37.2±0.14	16.8±0.37
T6	61.6±0.13	24.9±0.10	36.8±0.11	16.2±0.37

Table.5 Growth parameters of *Luffa acutangula* in 30 days

TREATMENT	PLANT HEIGHT	ROOT LENGTH	SHOOT LENGHT	No. of LEAVES	No. Of branches
C	70.5±0.13	21.8±0.12	48.7±0.16	12.6±0.86	1.0±0.31
(T1)	75.9±0.13	25.7±0.13	50.2±0.13	15.2±0.58	1.4±0.24
T2	141.8±0.11	38.7±0.11	103.2±0.14	24.6±0.40	7.0±0.31
T3	111.1±0.10	29.1±0.12	82.1±0.14	20.2±0.37	2.2±0.37
T4	114.9±0.12	31.2±0.13	83.7±0.11	21.2±0.37	3.0±0.31
T5	142.3±0.10	37.7±0.13	105.6±0.11	24.4±0.51	4.4±0.24
T6	125.2±0.13	35.2±0.10	100.1±0.12	23.2±0.37	3.4±0.24

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Table.6 Growth parameters of *Luffa acutangula* in 40 days

TREATMENT	PLANT HEIGHT	ROOT LENGHT	SHOOT LENGHT	No. of LEAVES	No. of branches	No. of male flowers	No. of female flowers
C	89.7±0.13	32.8±0.13	56.7±0.14	18.4±0.24	1.2±0.24	8.2±0.58	2.2±0.37
(T1)	106.6±0.13	34.0±0.12	72.5±0.15	24.8±0.37	1.8±0.37	8.4±0.51	3.0±0.31
T2	165.6±0.11	47.2±0.12	118.5±0.12	30.4±0.81	11.0±0.54	47.0±1.22	8.6±0.51
T3	124.7±0.10	36.1±0.11	88.6±0.11	26.2±0.37	5.4±0.24	27.6±0.67	5.4±0.24
T4	134.0±0.12	39.7±0.12	94.3±0.11	26.8±0.66	6.2±0.37	36.2±0.37	7.2±0.37
T5	158.5±0.10	45.3±0.15	113.2±0.14	30.1±0.66	7.6±0.51	39.4±0.87	8.0±0.31
T6	153 .2±0.13	44.2±0.14	108.9±0.15	27.8±0.24	4.8±0.37	36.0±0.44	6.8±0.37

Table.7 Growth parameters of *Luffa acutangula* in 50 days

TREATMENT	PLANT HEIGHT	ROOT LENGHT	SHOOT LENGHT	No.of LEAVES	No.of branches	No.of male flowers	No.of female flowers
C	105.9±0.12	36.8±0.14	69.1±0.13	21.0±0.44	3.0±0.31	21.0±0.44	4.4±0.24
(T1)	125.5±0.13	42.1±0.1 0	83.5±0.31	26.4±0.67	3.6±0.24	21.4±0.75	4.4.0±0.24
T2	177.8±0.09	50.1±0.11	127.8±0.09	40.6±0.75	13.2±0.58	66.0±0.70	16.8±0.37
T3	143.7±0.10	44.3±0.11	98.7±0.03	28.8±0.67	5.4±0.37	42.0±0.54	7.6±0.24
T4	143.0±0.10	46.1±0.11	111.3±0.11	30.2±0.37	8.4±0.24	48.2±0.54	10.6±0.40
T5	170.6±0.09	47.7±0.17	122.9±0.70	40.0±0.44	10.4±0.24	64.2±0.37	16.6±0.24
T6	166 .1±0.13	44.2±0.14	119.3±0.11	37.0±0.31	7.0±0.31	53.8±0.37	10.2±0.20

Table.8 Yield parameters of Luffa acutangula

TREATMENT	FRUIT LENGHT (cm)	FRUIT WIDTH (cm)	FRUIT WEIGHT(gm)
C	8.7±0.14	11.2±0.11	160.3±0.77
(T1)	22.5±0.15	12.4±0.15	195.0±1.00
T2	29.8±0.10	13.8±0.10	383.3±0.99

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T3	25.5±0.13	13.1±0.14	261.4±1.32
T4	26.5±0.12	13.6±0.13	300.6±0.74
T5	29.4±0.10	14.6±0.11	465.5±0.82
T6	28.4±0.11	13.4±0.11	395.0±0.77

Level of significance @ 1%

RESULTS AND DISCUSSION

The present study was intended to provide some assessment on the different liquid organic fertilizer. Using the Panchagavya, Beejamrutha and Jeevamrutha are used as six concentration such as (B+J) T1,T2,(P+B+J)T3,T4,T5,T6. During our experiment, it was observed that as (B+J) T2 concentration shows increased plant growth rate when compared to the other concentrations. Normally the treated plants gave much better results as compared to those of control plants. In the present study, the maximum height of 177.8cm was observed in 50 days when treated with (B+J)T2 as a fertilizer whereas the untreated plants shows 105.9cm only. The shoot length was found to be better in (B+J)T2 (127.8cm) as well as (P+B+J)T5 122.9cm. the climbing wil be start after 17 th day itself. Among the treated plants (B+J) T1 shows very less growth rate when compared to the other concentration. In the (B+J)T2 concentration, the number of leaves was higher in 40.6 in 50 days. The root length also better growth when compared to the control. In treated plants, the number of female and male flowers was increased. After flowering stage, the female flowers are developed into fruit. The maturation stage also very fast when compared to the other. The plants sprayed with panchagavya produce bigger leaves and develop denser canopy (Somasundaram et al 2007, Tharmaraj et al 2011). The lowest concentration of N.P and K were observed in the plants applied with jeevamrutha or beejamrutha alone as compared to beejamrutha+jeevamrutha+beejamrutha or panchagavya alone(Gore et al 2011). Panchagavya also significantly increased the yield attributes and decreased the disease when compared to check is well documented by Yadav et al.,2006. Esakkiammal et al .,2015,Somasundaram et al., 2004observed that the enhanced growth may be due to the presence of growth regulatory substances such as IAA,GA,cytokinin, essential plant nutrients, effective microorganisms and biofertilizers like acetobacter,azospirillum and phosphobacterium present in panchagavya and vermiwash.panchagavya is also being sought to improve crop establishment and health(sornalatha et al 2018). There is statistically significant between the control and the treatment. Devakumar et al.,(2011) who have reported that both jeevamrutha and panchagavya have enhanced the growth of nitrogen fixers in locally available substrates such as FYM,pressmud,compost and digested biogas slurry. Sornalatha et al 2018 reported that the use of liquid products such as Panchagavya, Beejamrutha and Jeevamrutha results in higher growth , yield and quality of crops. sreenivasa et al.,(2009) studied that the presence of such beneficial microbial biomass and nutrient status might have resulted in improved seed germination, seedling length and seed vigour in soybean indicating beejamrutha as an efficient plant growth stimulant. There is significantly higher nitrogen fixers were observed due to the application of jeevamrutha. Higher bacteria,fungi,actinomycetes,N-fixers and P-solubilizers were found in organic liquid formulation such as jeevamrutha and panchagavya.(Boraiah et al.,(2017))

CONCLUSION

Use of organic liquid fertilizers is better for the plant growth and yield of the crops. We recommended the (B+J) T2 and (P+B+J)T5 are used as a fertilizer for plant growth.

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