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Evaluation of Amritapani and Sanjivak liquid organic manures on growth, yield and economics of finger millet (*Eleusine coracana* L.)

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Abstract
The field experiment in Finger millet was conducted during *Kharif* 2019 in red sandy lomy soil of University of Agricultural Sciences, GKVK, Bengaluru with different liquid organic nutrient management practices. The growth parameters were significantly varied with application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} produced significantly taller plants, number of tillers, leaf area and dry matter accumulation at harvest (95.14cm, 3.87, 1066.80cm^2 & 99.93g respectively) as compared to all other treatments in the experiment. Whereas, lower plant height, number of tillers, leaf area and total dry matter accumulation at harvest Sanjivak @ 75% N equivalent ha^{-1}(75.66cm, 2.80, 660cm^2 & 72.57g respectively). Higher net returns and BC ratio (Rs. 95740 ha^{-1} and 3.53, respectively) recorded with application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} and lower net returns and BC ratio (Rs. 55338 ha^{-1} and 2.49, respectively) were obtained with Sanjivak @ 75% N equivalent ha^{-1}.

Keywords: Finger millet, amritapani, sanjivak, yield and economics

Introduction
Finger millet (*Eleusine coracana* L. Gaertin) crop is mainly grown under rainfed as dryland crop and in Southern Karnataka widely cultivated in red soils under constrained resources. It is also known as Kurrakan millet, ragi, nachni (India), African millet, rapoko (South Africa), dagusa (Ethiopia). It is one of the most important millet crops grown for grain and forage purposes under a variety of agro climatic conditions. Finger millet is known for its characteristic drought tolerance with a remarkable rejuvenation capacity once moisture stress is relieved. More importantly, its increased plasticity and adaptability to different ecological conditions, transplantability, better fitness to different cropping systems, and mid-season correction during monsoon vagaries made it a popular crop in contingent plans (Krishna sastry *et al*., 1982, Seetharam, 1986 and Krishne Gowda, 2004) [10, 11, 19]. It is a staple food crop rich in calcium (376 to 515 mg 100 g^{-1}), iron (3.7 to 6.8 mg 100 g^{-1}) and protein (8 to 11%). It is also used in many preparations, such as cakes, sweets, malts, etc. Finger millet products proved to prevent high levels of cholesterol and intestinal cancer. Carbohydrate content in finger millet makes it possible to release energy slowly, resulting in lower blood glucose accumulation, which is beneficial to diabetic patients. It is grown in Karnataka, Tamil Nadu, Andhra Pradesh, Orissa, Jharkhand, Maharashtra and Uttaranchal over an area of 11.38 lakh ha with a production of 18.21 lakh tons and a productivity of 1,601 kg ha^{-1}. Karnataka is the largest producer of finger millet in India and grown in 7.05 lakh ha with an annual output of 11.88 lakh tons and a productivity of 1,685 kg ha^{-1} (Anon., 2018) [2].

Material and Methods
The experiment was conducted in *kharif*-2019 at ZARS Organic Block, University of Agricultural Sciences, Gandhi Krishi Vigyan Kendra, Bengaluru. It is situated at a latitude and longitude of 130 05"N and 770 34"E, respectively and at an altitude of 924 m above sea level. Annual precipitation ranges from 528 mm to 1374.4 mm with a mean of 915.8 mm. It is classified under the Agro-Climatic Zone - V (Eastern Dry Zone) of Karnataka. The physical, chemical and biological properties of the experimental soil were examined using a composite

soil sample from 0-15 cm depth. The findings are presented in Table 3.1. The soil was sandy loam with 33.8 and 36.02 per cent of coarse and fine sand, 8.6 per cent of silt and 21.4 per cent clay. With a bulk density of 1.43 g cc^{-1}, water holding capacity was 39.31 per cent. The soil pH was almost neutral (7.32), the electrical conductivity was (0.14 dSm^{-1}) and organic carbon content was found low (0.31%). Coming to the major nutrients, soil found medium in available nitrogen and potassium (325.46 kg ha^{-1}& 142.3 kg ha^{-1}, respectively) and high in available phosphorus (34.4 kg ha^{-1}). Soil was analyzed for microbial population *viz*., bacteria (20.3 x 10^6 CFU g^{-1} soil), fungi (13.4 x 10^3 CFU g^{-1} soil) and actinomycetes (6.7 x 10^3 CFU g^{-1} soil). The experiment included of thirteen treatments laid out in randomized complete block design with three replications. Treatments involved organic manures application. T_1 Amritapani @ 75% N equivalent ha^{-1}, T_2 Amritapani @ 100% N equivalent ha^{-1}, T_3 Amritapani @ 125% N equivalent ha^{-1}, T_4 Sanjivak @ 75% N equivalent ha^{-1}, T_5 Sanjivak @ 100% N equivalent ha^{-1}, T_6 Sanjivak @ 125% N equivalent ha^{-1}, T_7 Amritapani + Sanjivak @ 75% N equivalent ha^{-1} (1:1), T_8 Amritapani + Sanjivak @ 100% N equivalent ha^{-1}(1:1), T_9 Amritapani + Sanjivak @ 125% N equivalent ha^{-1}(1:1), T_{10} FYM @ 100% N equivalent ha^{-1} and T_{11} FYM 7.5 t ha^{-1} + 50:37.5:40 NPK kg ha^{-1} (PoP as control). The finger millet variety ML - 365 seeds were sown in lines at the rate of 12.5 kg ha^{-1} at a depth of 2-3 cm, maintaining 30 cm row to row and 10 cm plant to plant spacing. The crop was fertilized with 50 kg N, 37.5 kg P_2O_5 and 40 kg K_2O through urea, single super phosphate and muiate of potash respectively, FYM at 7.5 q ha^{-1} and labour input for all the operations. The grain and straw yield observations are taken and calculated the harvest index by using the formula.

$$\text{Harvest Index (HI)} = \frac{\text{Economic yield (kg ha}^{-1})}{\text{Biological yield (kg ha}^{-1})}$$

Gross returns = Total value of the produce (Grain and straw in finger millet).
Net returns = Gross returns - Cost of cultivation.
The benefit cost ratio was worked out by using the following formula.

$$\text{Benefit Cost Ratio} = \frac{\text{Gross returns (Rs. ha}^{-1})}{\text{Cost of cultivation (Rs. ha}^{-1})}$$

Results and Discussion

The experiment results were discussed in the subsequent sub-headings:

Effect on plant height

Plant height at 30 DAS did not differ significantly but increased progressively from 60 DAS to harvest and was significantly. Influenced by different organic nutrient management at all growth stages. Application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) recorded significantly greater plant height at 60, 90 DAS and at harvest (44.62, 95.29 & 96.14 cm, respectively) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (41.67, 87.88 & 89.37 cm, respectively) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (40.59, 85.67 & 88.16 cm, respectively) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower plant. Height (32.85, 75.06 & 75.66 cm, respectively) in table 1.

Table 1: Plant height (cm), leaf area (cm^2), number of tillers $Plant^{-1}$, and dry matter accumulation (g) of finger millet influenced by organic management practices

Treatments	Plant height (At harvest)	Leaf area (At harvest)	Number of tillers $plant^{-1}$ (At harvest)	Dry matter accumulation
T_1 = Amritapani @ 75% N equivalent ha^{-1}	77.69	689	2.80	75.64
T_2 = Amritapani @ 100% N equivalent ha^{-1}	85.14	867	2.93	87.05
T_3 = Amritapani @ 125% N equivalent ha^{-1}	89.37	1050	3.67	95.54
T_4 = Sanjivak @ 75% N equivalent ha^{-1}	75.66	660	2.80	72.57
T_5 = Sanjivak @ 100% N equivalent ha^{-1}	84.93	847	3.07	83.93
T_6 = Sanjivak @ 125% N equivalent ha^{-1}	88.16	1041	3.53	91.03
T_7 = Amritapani + Sanjivak @ 75% N equivalent ha^{-1} (1:1)	78.21	692	3.20	80.18
T_8 = Amritapani + Sanjivak @ 100% N equivalent ha^{-1} (1:1)	88.14	874	3.13	88.14
T_9 = Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (1:1)	96.14	1067	3.87	99.93
T_{10} = FYM @ 100% N equivalent ha^{-1}	79.86	835	3.27	84.08
T_{11} = FYM 7.5 t ha^{-1} + 50:37.5:40 NPK kg ha^{-1}(PoP as control)	79.84	741	3.40	82.62
S. Em. ±	3.92	49.25	0.16	3.87
C.D. (P = 0.05)	11.55	145.27	0.48	11.42

The increased availability of nutrients in the soil through mineralization of organic sources could have triggered cell elongation and multiplication resulting in high growth rate of shoots in turn plant height of finger millet. Over control. Combination of organics and inorganics which ensured ready availability of nutrients at initial stages of crop is due to improved soil properties and long term nutrient availability. through organics. Similar results were noticed with Sunitha *et al.* (2004) [20], Narolia *et al.* (2009) [13] and Giribabu *et al.* (2010) [7, 8].

Effect on plant leaf area

Leaf area recorded initially at 30 DAS found non-significant. With Application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) recorded. Significantly higher leaf area at 60, 90 DAS and harvest (603, 691 & 1067 cm^2, respectively) followed by Amritapani @ 125% Nequivalent ha^{-1} (T_3) (557, 616 & 1050 cm^2, respectively) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (554, 605 & 1041 cm^2, respectively) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower leaf area (311, 446 & 660 cm^2, respectively) in table 1.

Effect on number of tillers

Number of tillers $plant^{-1}$ initially at 30 DAS found no significant difference but at 60, 90 DAS and at harvest, number of tillers $plant^{-1}$ differed significantly with different organic nutrient management. Significantly higher number of tillers (2.00, 3.13 & 3.87, respectively) at all growth stages was observed in treatment receiving Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (1.93, 2.93 & 3.67, respectively) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (1.87, 2.80 & 3.53, respectively) which were on par. with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly. Lower number of tillers (1.30, 2.07 & 2.80, respectively) in table 1.

Effect on dry matter accumulation

Total dry matter accumulation recorded initially at 30 DAS found no significant difference but at 60, 90 DAS and at harvest, Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) noticed significantly higher. Total dry matter (12.50, 52.13 & 99.93 g plant^{-1}, respectively). Among different organic nutrient management followed, Amritapani @ 125% N equivalent ha^{-1} (T_3) (12.06, 51.40 & 95.54g plant^{-1}, respectively) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (11.69, 49.97 & 91.03 g plant^{-1}, respectively) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower total dry matter (8.76, 37.81 & 72.57 g plant^{-1}, respectively) in table 1.

Improved physico-chemical characteristics and the long-term availability of the nutrients with organic substances could lead to an accumulation of significantly higher dry matter by a higher number of tillers, maximum leaf area, and an increasing photosynthesis. The findings were consistent with Giribabu *et al.* (2010) [7, 8] findings.

Application of different organic nutrient sources in conjunction increased the plant height and number of tillers plant^{-1} which could be attributed to the balanced supply of nutrients (Sable *et al*., 2007) [18].

Effect on yield components

Number of productive tillers plant^{-1}

Number of productive tillers plant^{-1} differed significantly due to treatment effects. Among different treatments, significantly higher number of productive tillers plant^{-1} (3.33) (T_9) was noticed in treatment receiving Amritapani + Sanjivak @ 125% N equivalent ha^{-1} followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (3.13) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (3.07) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower number of productive tillers plant^{-1} (2.33) in table 2.

Table 2: Influence of different organic nutrient management practices on yield and yield components of finger millet

Treatments	Ear head length (cm)	Finger length (cm)	No. of productive tillers plant^{-1}	No. of fingers ear head^{-1}	Grain yield plant^{-1} (g)	1000 grain weight (g)
T_1 = Amritapani @ 75% N equivalent ha^{-1}	9.90	8.39	2.40	5.73	8.55	2.95
T_2 = Amritapani @ 100% N equivalent ha^{-1}	9.81	9.71	2.60	6.93	9.58	3.05
T_3 = Amritapani @ 125% N equivalent ha^{-1}	11.04	10.74	3.13	7.47	10.47	3.22
T_4 = Sanjivak @ 75% N equivalent ha^{-1}	9.20	7.68	2.33	5.50	8.42	2.92
T_5 = Sanjivak @ 100% N equivalent ha^{-1}	10.15	9.67	2.60	6.77	9.49	3.05
T_6 = Sanjivak @ 125% N equivalent ha^{-1}	10.60	10.30	3.07	7.40	10.31	3.20
T_7 = Amritapani + Sanjivak @ 75% N equivalent ha^{-1} (1:1)	10.03	9.08	2.47	6.87	8.99	2.97
T_8 = Amritapani + Sanjivak @ 100% N equivalent ha^{-1} (1:1)	10.04	10.10	2.73	7.00	8.94	3.19
T_9 = Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (1:1)	11.61	11.29	3.33	7.67	10.89	3.38
T_{10} = FYM @ 100% N equivalent ha^{-1}	10.11	9.23	2.53	6.87	9.49	3.04
T_{11}= FYM 7.5 t ha^{-1} + 50:37.5:40 NPK kg ha^{-1} (PoP as control)	10.03	9.21	2.50	6.73	9.33	2.99
S.Em±	0.42	0.51	0.15	0.36	0.46	0.08
C.D (p = 0.05)	1.24	1.50	0.45	1.05	1.37	0.25

Number of fingers ear head^{-1}

Significant difference was found in the number of fingers ear head^{-1} due to different organic nutrient management. Among different treatments, numerically higher number of fingers ear head^{-1}(7.67) was recorded with the application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) which is followed Amritapani @ 125% N equivalent ha^{-1} (T_3) (7.47) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (7.40) and were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1}(T_4) recorded significantly lower number of fingers ear head^{-1}(5.50) in table 2.

Ear head length

Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) noticed Significantly higher number of ear head length (11.61) among different organic nutrient management followed by, Amritapani @ 125% N equivalent ha^{-1} (T_3) (11.04) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (10.60) were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower number of ear heads length (9.20) in table 2.

Finger length

Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) noticed Significantly higher finger length (11.29 cm) among different organic nutrient management followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (10.74 cm) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (10.30 cm) which were. on par. with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower finger length (7.68 cm) in table 2.

Grain yield plant^{-1}

Among different treatments, significantly higher grain yield plant^{-1}(10.89 g) was recorded with the application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) which is followed Amritapani @ 125% N equivalent ha^{-1} (T_3) (10.47 g) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (10.31 g) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower grain yield plant^{-1} (8.42 g) in table 2.

1000 grain weight

Among different organic nutrient management Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) noticed significantly higher 1000 grain weight (g) (3.38 g) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (3.22 g) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (3.20 g) and were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower 1000 grain weight (g) (2.92 g) in table 2.

NPK are major essential nutrients needed to promote meristematic and physiological activities. These activities promote higher photosynthetic activities leading to the production of sufficient assimilates for the subsequent translocation to different sinks, leading to the production of higher sink components such as productive tillers m^{-2}, number of fingers of the ear^{-1}, length of the finger, weight of the ear^{-1} and test weight. The results are also confirmed by the findings of Pratap *et al.* (2008) [16], Jagathjothi *et al.* (2010) [9] and Giribabu *et al.* (2010) [7, 8].

Effect on yield

Grain yield

Grain yield of finger millet differed significantly due to different organic nutrient management. Significantly higher. grain yield (3985 kg ha^{-1}) was obtained in treatment receiving Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (3683 kg ha^{-1}) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (3629 kg ha^{-1}) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower grain yield (2738 kg ha^{-1}) in table 3. The conjunctive use of organic and inorganic sources has a beneficial effect on the physiological process of plant metabolism and growth, resulting in higher yields of grain. The easy availability of nitrogen due to the mineralization of organic matter there by the influence of the shoot and root growth favoring the absorption of other nutrients. Similar results were obtained from Yakadri and Reddy (2009) [23]. Nutrients also enhance the supply of carbohydrates to seeds, increasing yield components such as productive tillers m^{-2}, number of ear-head $fingers^{-1}$, finger length, weight of ear^{-1} grains and test weights which have a direct effect on grain yield. Duryodhana *et al.* (2004) [6], Varalakshmi *et al.* (2005) [22], Umesh *et al.* (2006) [21], Basavaraju and Purushotham (2009) [4] reported similar results. Reduced yield in finger millet compared to sole crop can be attributed to competition for light, moisture and nutrients with suppressive effect on crops, reduced solar radiation on crop canopy. Similar results have been reported by Deswal and Nandal (2008) [5], Prasad *et al*. (2011) [15] and Kumar *et al*. (2013) [10, 12, 21].

Table 3: Influence of organic nutrient management practices on grain, yield, straw yield and harvest index of finger millet

Treatments	Grain yield (kg ha^{-1})	Straw yield (kg ha^{-1})	Harvest index
T_1 = Amritapani @ 75% N equivalent ha^{-1}	2845	4420	0.39
T_2 = Amritapani @ 100% N equivalent ha^{-1}	3347	5024	0.40
T_3 = Amritapani @ 125% N equivalent ha^{-1}	3683	5188	0.42
T_4 = Sanjivak @ 75% N equivalent ha^{-1}	2738	4220	0.39
T_5 = Sanjivak @ 100% N equivalent ha^{-1}	3301	4921	0.40
T_6 = Sanjivak @ 125% N equivalent ha^{-1}	3629	5142	0.41
T_7 = Amritapani + Sanjivak @ 75% N equivalent ha^{-1} (1:1)	3160	4873	0.39
T_8 = Amritapani + Sanjivak @ 100% N equivalent ha^{-1} (1:1)	3345	5064	0.40
T_9 = Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (1:1)	3985	5367	0.43
T_{10} = FYM @ 100% N equivalent ha^{-1}	3389	4910	0.41
T_{11}= FYM 7.5 t ha^{-1} + 50:37.5:40 NPK kg ha^{-1} (PoP as control)	3292	4890	0.40
S.Em±	165.37	214.03	0.02
C.D (p = 0.05)	487.85	631.38	NS

Straw yield

Straw yield of finger millet was significantly influenced different organic nutrient management. Significantly higher straw yield (5367 kg ha^{-1}) was obtained in Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (5188 kg ha^{-1}) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (5142 kg ha^{-1}) which were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower grain yield (4220 kg ha^{-1}) in table 3. Higher yields of straw under joint organic and inorganic sources was due to higher plant height, LAI, accumulation of dry matter, increased availability of nutrients and uptake. These results are consistent with the results of Basavaraju and Purushotham (2009) [4], Giribabu *et al.* (2010) [7, 8] and Jagathjothi *et al.* (2010) [9].

Harvest index

There was no significant difference in Harvest index of finger millet. Numerically higher harvest index (0.43) was obtained with the application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) followed by Amritapani @ 125% N equivalent ha^{-1} (T_3) (0.42) and Sanjivak @ 125% N equivalent ha^{-1} (T_6) (0.41) and were on par with each other. Whereas, treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) recorded significantly lower harvest index (0.39) in table 3. Proportionate increase in both grain and straw yields with nitrogen sources, resulting in a non-significant effect. Basavarajappa *et al.* (2003) [3] and Rajesh (2012) [17] have obtained similar results in foxtail millet and pearl millet.

Economics

The data pertaining to economics of finger millet cultivation influenced by organic manures presented in Table 4. The higher gross returns, net return and B: C ratio (Rs. 133577 ha^{-1}, 95740 ha^{-1} and 3.53, respectively) in finger millet were obtained with application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (T_9) and lowest gross returns, net return and B: C ratio (Rs. 92576 ha^{-1}, 55338 ha^{-1} and 2.49, respectively) with treatment Sanjivak @ 75% N equivalent ha^{-1} (T_4) in table 2. Anand (2017) at Chintamani obtained higher B: C ratio of 3.85 in finger millet with the application of EBDLM @ 50 kg N equivalent ha^{-1} + 3 sprays of panchagavya @ 3%. Prakasha *et al.* (2015) [14] in Bangalore obtained a higher B:C ratio of 2.20 in guni method of cultivation of finger millet with a spacing of 60 x 60 cm + 100 per cent RDF.

Table 4: Economics of finger millet as influenced by different organic nutrient management

Treatments	Cost of cultivation (Rs. ha^{-1})	Gross returns (Rs. ha^{-1})	Net returns (Rs. ha^{-1})	B:C ratio
T_1 = Amritapani @ 75% N equivalent ha^{-1}	37237	96238	59000	2.58
T_2 = Amritapani @ 100% N equivalent ha^{-1}	37537	112957	75419	3.01
T_3 = Amritapani @ 125% N equivalent ha^{-1}	37837	123795	85958	3.27
T_4 = Sanjivak @ 75% N equivalent ha^{-1}	37237	92576	55338	2.49
T_5 = Sanjivak @ 100% N equivalent ha^{-1}	37537	111354	73816	2.97
T_6 = Sanjivak @ 125% N equivalent ha^{-1}	37837	122016	84178	3.22
T_7= Amritapani + Sanjivak @ 75% N equivalent ha^{-1} (1:1)	37237	106846	69609	2.87
T_8 = Amritapani + Sanjivak @ 100% N equivalent ha^{-1} (1:1)	37537	112962	75425	3.01
T_9 = Amritapani + Sanjivak @ 125% N equivalent ha^{-1} (1:1)	37837	133577	95740	3.53
T_{10} = FYM @ 100% N equivalent ha^{-1}	41137	114115	72978	2.77
T_{11}= FYM 7.5 t ha^{-1} + 50:37.5:40 NPK kg ha^{-1} (PoP as control)	38931	111024	72093	2.85

Conclusion

Application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} produced significantly taller plants, maximum number of tillers $plant^{-1}$, leaf area and total dry matter accumulation at 60, 90 DAS and harvest (95.14 cm, 3.87, 1066.80 cm^2 & 99.93 g respectively) as compared to all other treatments in the experiment.

Significantly higher number of productive tillers $plant^{-1}$, number of fingers ear $head^{-1}$, longer ear heads and 1000 grain weight (3.33, 7.67, 11.61 cm & 3.38 g, respectively) were recorded with the application of Amritapani + Sanjivak @ 125% N equivalent ha^{-1} over other treatments. However, they were on par with Amritapani @ 125% N equivalent ha^{-1} (3.13, 7.47, 11.04 cm & 3.22 g, respectively).

Application of Amritapani + Sanjivak @ 125 per cent N equivalent ha^{-1} produced significantly higher grain yield, straw yield and harvest index of finger millet (3,985.00, 5,366.67 kg ha^{-1} & 0.43, respectively

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