International Journal of Bio-resource and Stress Management 2018, 9(6):762-768

Research Article

Doi: HTTPS://DOI.ORG/10.23910/IJBSM/2018.9.6.1933

Natural Resource Management

Effect of Integrated Nutrient Management on Growth and Yield of Baby Corn (*Zea mays* L.)

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Article History

Article ID: AR1933
Received in 01st December, 2018
Received in revised form 29th December, 2018
Accepted in final form 31st December, 2018

Abstract

A field experiment was conducted to study the effect of integrated nutrient management on growth, yield and quality of baby corn (*Zea mays* L.) on sandy loam soil during the *kharif* season of 2014. The experiment was laid down in randomized block design having seven treatments (Control, 100% recommended dose of nitrogen, 5 t of farm yard manure+100 kg inorganic nitrogen ha^{-1}, 10 t of farm yard manure+75 kg inorganic nitrogen ha^{-1}, 15 t of farm yard manure+50 kg inorganic nitrogen ha^{-1}, 20 t of farm yard manure+25 Kg inorganic nitrogen ha^{-1}, 25 t of farm yard manure ha^{-1}) replicated four times. Significant increase in all growth characters, yield contributing characters, yield and fodder yield of baby corn was observed with integrated nutrient management over control. Moreover, among nutrient management treatments, the integration of 5 t of farm yard manure with 100 kg of inorganic nitrogen ha^{-1} came out to be best for all growth characters viz. plant height, leaf area index. The results obtained with application of 5 t of farm yard manure+100 kg inorganic nitrogen were comparable with recommended dose of nitrogen. Similarly, a significant increase in yield contributing characters, yield and fodder yield were observed with application of 5 t of farm yard manure+100 kg inorganic nitrogen ha^{-1}, which is also found to be at par with the recommended dose of nitrogen (125 kg ha^{-1}). Further, the above said treatment also gave maximum profit.

Keywords: Baby corn, integrated nutrient management, FYM, economics

1. Introduction

Baby corn is the ear of maize (*Zea mays* L.) plant harvested young, especially when the silk have either not been emerged or just emerged, and no fertilization has taken place, depending on the cultivar grown (Muthukumar et al., 2007). It is generally harvested early, while the ears are very small and immature. Baby corn is a profitable crop that allows a diversification of production, aggregation of value, and increased income. Nutritive value of baby corn is very high as it contains 89.1% moisture, 0.20 g fat, 8.20 mg carbohydrates, 1.90 g protein, 28.0 mg calcium, 86.0 mg phosphorus, 0.10 mg iron, 0.05 mg thiamine, 0.08 mg riboflavin, 11.0 mg ascorbic acid, 0.03 mg niacin etc, per 100 g of edible portion (Das et al., 2008). Baby corn is a nutrient exhaustive crop (Kotru et al., 2012) and due to high planting density, the integrated nutrient management (INM) practice is important to retain productivity of the soil along with heavy returns. It has been found that no single source of nutrients is capable of supplying the necessary elements in adequate and balanced proportion and the use of inorganic fertilizers being a costly affair also leads to deterioration of soil health and quality of the produce. However, the use of organic sources alone, do not result in spectacular increase in crop yields, due to their low nutrient status and are also not easily available for a large scale use. Therefore, in the present context, a judicious combination of organic manures and chemical fertilizers may help to maintain soil and crop productivity. It also helps in restoring fertility of soil and improves nutrient use efficiency which is essential for improved and sustainable crop production. In order to check the effect of integrated nutrient management on the growth, yield and quality parameters of baby corn, while maintaining nutrient status of soil, the present study was planned.

2. Materials and Methods

A field experiment was conducted to study the Effect of integrated nutrient management on growth, yield and quality of baby corn (*Zea mays* L.) at the Students' research Farm, Khalsa College, Amritsar during the *kharif* season of 2014. Amritsar is located at 31°-38' North latitude and 74°-52' East longitude and at an altitude of 236 meters above mean sea level. Maximum temperature ranged between 35.0^0 and 46.4 °C while minimum temperature ranged between 23.0° and 32.2 °C. Maximum mean temperature 38.4 °C was recorded in the 28th week in July and minimum mean temperature 29.7 °C was recorded in 38th week in September. While, the maximum mean humidity 56.3% was recorded in 33rd week in August and minimum mean humidity 35.7% was recorded in 28th week in July. The soil of the experimental field was categorized as sandy loam. The soil tested low in organic carbon and available nitrogen (N). However, available phosphorus (P) and potassium (K) status were high. The soil pH and electrical conductivity values were within the normal range.

The experiment was laid down in randomized block design having seven treatments i.e. Control, 100% recommended dose of N (125 kg N ha^{-1}), 5 t of FYM+100 kg inorganic N ha^{-1}, 10 t of FYM+75 kg inorganic N ha^{-1}, 15 t of FYM+50 kg inorganic N ha^{-1}, 20 t of FYM+25 Kg inorganic N ha^{-1}, 25 t of FYM ha^{-1} replicated four times. The pretreated seeds of variety PMH-1 were sown by kera method in between the rows by using corn seed at the rate of 16 kg ha^{-1} with a spacing of 20×30 cm^2 on 17th July 2014. Half dose of nitrogen was applied at the time of sowing to all the plots as per treatment. Remaining half dose of nitrogen was applied at 30 DAS. Nitrogen was given in the form of Urea. Total six irrigations were given as per water requirements of the crop. Immature cobs (baby corn) were harvested at 2-3 days after silk emergence stage. Crop was harvested in three pickings manually. The crop was ready to 1st harvest within 61 DAS. Harvested cobs were marketed as fresh after dehusking. The crop was harvested as green fodder after the completion of cob picking and sold to a dairy farmer. Plant height, leaf area index were measured and recorded. Whereas, at maturity period the yield parameter like number of cobs per plants, baby corn length, baby corn girth, green cob weight, Baby cob weight, Baby corn yield, Green fodder yield were measured and recorded. Recorded data was analyzed statistically as per randomized block design (Cochran and Cox, 1963), using CPCS-1 software developed by the department of Mathematics and Statistics, PAU, Ludhiana, India.

3. Results and Discussion

3.1. Growth character

3.1.1. Periodic plant height

Plant height reflects the vegetative growth behavior of crop plants to the applied inputs. The comparison of treatment means presented in the Table 1 reveals that the rate of increase in plant height of baby corn was not uniform throughout the crop growth period. It was observed to be slow at initial growth stages and thereafter increased till harvest of the crop. Among various management treatments, significantly higher plant height was achieved, where 5 t of FYM+100 kg N through inorganic fertilizer was applied and It remained at par with 100% recommended dose of N. On the other hand, plant height of baby corn was recorded to be significantly lower than all the other treatments at all the observational stages with the application of control plot treatment.

From the observations taken at 15 DAS, it was found that significantly higher plant height of baby corn was attained with the application of 5t of FYM+100 kg N through inorganic fertilizer over the application of 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM and control. However, treatment having 5 t of farm yard manure+100 kg inorganic nitrogen ha^{-1} was found to be statistically at par with the application of 100% recommended dose of N and 10 t of FYM+75 kg inorganic nitrogen. Further, in plots where 10 t of FYM+75 kg inorganic N was applied were recorded statistically superior in attaining plant height over the treatments 20 t of FYM+25 kg inorganic N, 25 t of FYM and Control, but it remained at par with the treatment having 15 t of FYM+50 kg inorganic N. Moreover, treatment having 15 t of FYM+50 kg inorganic N was found to be statistically superior over control, but it has shown statistical parity with the treatments having 20 t of FYM+25 kg inorganic N and 25 t of FYM for plant height. On the other hand control plot treatment produced significantly low plant height of baby corn as compared to other treatments.

It was noted that at 30 DAS, treatment having 5 t of FYM+100 kg N through inorganic fertilizer achieved significantly more plant height than all the other treatments applied to baby corn except 100% of recommended dose of NPK, which, was found to be statistically at par with treatment having 5 t of FYM+100 kg N through inorganic fertilizer. Moreover, application of 10 t of FYM+75 kg inorganic N though observed a significant increase in plant height over the treatments having 20 t of

Table 1: Effect of INM on growth parameters at various growing stage of baby corn

Treatment	Periodic Plant height				Leaf area index			
	15 DAS	30 DAS	45 DAS	60 DAS	15 DAS	30 DAS	45 DAS	60 DAS
Control	26.4	46.9	78.8	132.4	0.16	0.32	3.25	4.13
100% RDN	37.8	65.5	120.3	184.1	0.31	1.38	6.00	6.55
5 t of FYM+100 kg inorganic N ha^{-1}	38.6	68.4	124.4	189.1	0.35	1.55	6.45	6.98
10 t of FYM+75 Kg inorganic N ha^{-1}	36.3	64.7	113.7	178.0	0.28	1.27	5.70	6.21
15 t of FYM+50 kg inorganic N ha^{-1}	34.4	60.8	104.5	165.9	0.27	1.00	5.03	5.73
20 t of FYM+25 kg inorganic N ha^{-1}	32.3	56.9	96.2	154.7	0.22	0.79	4.49	5.25
25 t of FYM ha^{-1}	31.9	53.0	88.1	143.2	0.21	0.56	3.95	4.75
SEm±	0.93	1.27	2.68	3.69	0.02	0.07	0.16	0.49
CD (p=0.05)	2.8	3.7	7.2	8.4	0.04	0.20	0.48	0.460

FYM+25 kg inorganic N, 25 t of FYM and control. Similar results were found by Patil et al. (2008); Kannan et al. (2013).

3.1.2. Leaf area index

Leaf area expresses the capacity of plants to trap solar energy for photosynthesis and it has marked influence on growth and yield of crop. Data in the Table 1 indicated that, in general, for the baby corn crop the rate of increase in leaf area index was very slow up to15 DAS and thereafter increased up to crop harvest. At all the periodic intervals, the plots where integrated nutrient management treatments were applied resulted in significantly higher leaf area index of the baby corn.

However, at 60 DAS, plots where 5 t of FYM+100 kg N was applied through inorganic fertilizer recorded significantly higher leaf area index of baby corn than all the other treatments except treatment having 100% dose of nitrogen through inorganic fertilizer. Moreover, treatment having 100% dose of nitrogen through inorganic fertilizer was found statistically better in having leaf area index than control plot treatment, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N and 25 t of FYM but was found to be at par with the treatment having 10 t of FYM+75 kg inorganic N. Moreover, application of 10 t of FYM+75 kg inorganic N was found to be significantly higher than the control plot treatment, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N and 25 t of FYM in leaf area index. Further, application of 15 t of FYM+50 kg inorganic N helps in attaining significantly more leaf area index than the treatments having 20 t of FYM+25 kg inorganic N and 25 t of FYM and control plot. Similarly, 20 t of FYM+25 kg inorganic N found to be superior over the 25 t of FYM. While, the leaf area index in the control plots was found to be statistically lower than all other treatments.

Moreover, the similar results of leaf area index of baby corn as observed at 60 DAS was observed at 45 DAS and 30 DAS with the application of all treatments applied to the baby corn.

However, it was observed at 15 DAS, that application of treatment 5 t of FYM+100 kg of inorganic N resulted in significantly higher leaf area index over the all other treatments applied to the baby corn except the treatment having 100% recommended dose of N. Moreover, 100% recommended dose of N resulted in significantly higher leaf area index over the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments, but it exhibited statistical parity with the treatments having 10 t of FYM+75 kg inorganic N and 15 t of FYM+50 kg inorganic N. Moreover, 15 t of FYM+50 kg inorganic N was found to be significantly better in producing leaf area index over the 20 t of FYM+25 kg inorganic N and 25 t of FYM and control plot treatments. Almost similar results were obtained by Luikham et al. (2003) and Pathak et al. (2002)

3.2. Yield contributing characters

3.2.1. No. of cobs plant^{-1}

No. of cobs plant^{-1} is one of the most important character, which has direct relationship with the ultimate yield of baby corn. It is the total number of cobs which initiate on an individual plant. As the data in the Table 2 reveals, maximum number of cobs per plant were obtained with treatment having 5 t of FYM+100 kg N, equally followed by treatment 100% recommended dose of N and 10 t of FYM+75 kg N, which were at par with it statistically.

However, 100% recommended dose of N was observed to be superior over the 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments although remained at par with the 10 t of FYM+75 kg N and 5 t of FYM+100 kg N treatments. Besides, the application of 100% recommended dose of N, 5 t of FYM+100 kg inorganic N and 10 t of FYM+75 kg inorganic N resulted in

Table 2: Effect of INM on yield contributing characters and yield of baby corn

Treatment	No. of cobs plant^{-1}	Baby corn length (cm)	Baby corn girth (cm)	Green cob weight (g)	Baby cob weight (g)	Baby corn yield (q ha^{-1})	Green fodder yield (q ha^{-1})
Control	1.43	7.15	3.79	32.7	6.70	9.15	177.8
100% RDN	3.00	8.94	5.11	51.2	10.4	18.49	299.4
5 t of FYM+100 kg inorganic N ha^{-1}	3.00	9.13	5.27	54.3	10.6	19.31	312.3
10 t of FYM+75 Kg inorganic N ha^{-1}	3.00	8.75	5.01	48.1	10.1	18.38	289.1
15 t of FYM+50 Kg inorganic N ha^{-1}	2.80	7.96	4.73	44.4	8.75	16.35	269.2
20 t of FYM+25 kg inorganic N ha^{-1}	2.37	7.73	4.53	40.9	8.24	14.63	242.3
25 t of FYM ha^{-1}	1.89	7.47	4.06	37.1	7.80	12.39	210.4
SEm±	0.06	0.07	0.07	1.08	0.12	0.29	4.41
C D (p=0.05)	0.19	0.21	0.19	3.19	0.35	0.85	13.09

same number of cobs per plant however, were significantly better than the application of 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. On the other hand, the control plot treatment resulted in significantly lower number of cobs in baby corn as compared to all other treatments applied to the baby corn. However, 15 t of FYM+50 kg inorganic N was significantly lower than the treatments 100% recommended dose of N, 5 t of FYM+100 kg N and 10 t of FYM+75 kg N but was observed to produce statistically higher number of cobs than the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. Similarly, results of 20 t of FYM+25 kg inorganic N were statistically higher than the 25 t of FYM and control plot treatments. Moreover, 25 t of FYM was observed to be statistically superior in producing number of cobs per plant over the control plot treatment. Similar trend of results was observed by Lone et al. (2013).

The probable reason behind this increase in number of cobs per plant might be owing to the favourable soil conditions and balanced release of plant nutrients throughout the crop growth period in plots treated with both inorganic and organic sources. Same results were also presented by Joshi et al. (2013). Moreover, Dhaliwal et al. (2007) reported similar results of integrated nutrient management on long term experiment on wheat and maize.

3.2.2. Baby corn length

Baby corn length is an important parameter from the economic point of view as the sale of the baby corn depends upon the length of the baby corn and its tenderness. It further depends upon the time of harvesting and management conditions of the crop. From the data shown in the table 2, it is revealed that the application of 5 t of FYM+100 kg inorganic N was significantly superior to all the other treatments in producing baby corn length except the treatment where recommended dose of nitrogen was applied.

Further, recommended dose of N though, was significantly greater in producing baby corn length but it remains statistically at par with the application of 10 t of FYM+ 75 kg inorganic N. Moreover, application of 10 t of FYM+ 75 kg N through inorganic source was significantly higher in attaining baby corn length over the application of 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. Similarly, application of 15 t of FYM+50 kg inorganic N was statistically significant over the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. In the same fashion 20 t of FYM+25 kg inorganic N produced significantly higher baby corn length than 25 t of FYM. On contrary to it, statistically lowest baby corn length was observed in control plot treatment. The percent increase with application of treatments having 5 t of FYM+100 kg inorganic N, recommended dose of N, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM over control plot treatment was found to be 128%, 125%, 122%, 111%, 108% and 104% respectively in baby corn length.

It might be due to the improvement in soil physical and chemical conditions and balanced release of plant nutrients with the application of FYM and chemical fertilizers in a particular combination that leads to an increase in baby corn length with treatments having integrated nutrient management strategy. Rakib et al. (2011) also recorded increased baby corn length due to application of 75% RD +25% N (FYM) among all the treatment combinations.

3.2.3. Baby corn girth

Baby corn girth is an important parameter from the marketing point of view as it determines quality of baby corn. It depends upon plant vigour and environmental conditions. Data in The Table 2 shows that application of 5 t of FYM+100 kg inorganic N produced significantly greater baby corn girth than all the other treatments except treatment having 100% recommended dose of nitrogen which was found to be at par with it. Moreover, treatment having 10 t of FYM+75 kg inorganic N recorded significantly higher baby corn girth than all the other treatments, but remained statistically at par with treatment having 100% recommended dose of nitrogen.

Among the other treatments a significant increase in baby corn girth was recorded with the application of 15 t of FYM+50 kg inorganic N over the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. In the same way a significant increase in baby corn girth was achieved with 20 t of FYM+25 kg inorganic N over 25 t of FYM. However, statistically lower baby corn girth was recorded with the control plot treatment. The percentage increase in baby corn girth with 5 t of FYM+100 kg N through inorganic source, recommended dose of N, 10 t of FYM+75 kg inorganic N, 15 t of FYM+50 kg inorganic N ha, 20 t of FYM+25 kg inorganic N, 25 t of FYM over control plot treatment was 139%, 134%, 131%, 124%, 119% and 107% higher respectively.

Combined application of FYM and chemical fertilizers in a particular combination might have resulted in improved soil physical and chemical properties that increased the baby corn girth significantly with treatments having integrated nutrient management. Rakib et al. (2011) also revealed similar results in their research.

3.2.4. Green cob weight

Green cob weight is the economic part of the plant which persist the yield of the crop. According to the data given in the Table 2, all the treatments where N was applied whether through organic or inorganic sources have significantly affected the green cob weight of baby corn than control plot treatment. Maximum green cob weight (54.34 g) was attained with the application of 5 t of FYM+100 kg inorganic N which was significantly higher in green cob weight production of baby corn over all other treatments except, treatment 100% recommended dose of nitrogen.

Further, where 100% recommended dose of nitrogen was applied, significantly improved the green cob weight over all other treatments except treatment having 10 t of FYM+75 kg inorganic N. Moreover, with the application of 10 t of FYM+75 kg N through inorganic source there was a significant increase in green cob weight of baby corn over the15 t of FYM+50 kg inorganic N over the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments but, it exhibited statistical parity with recommended dose of fertilizer.

Among rest of the treatments, 15 t of FYM+50 kg inorganic N produced significantly higher green cob weight than the 20 t of FYM+25 kg inorganic N, 25 t of FYM and control plot treatments. Moreover, application of 20 t of FYM+25 kg inorganic N was significantly better over the 25 t of FYM and control plot treatments. However, it was observed that green cob weight recorded under control plot treatment was significantly lower as compared to all other treatments. The increase in green cob weight with the application of 5 t of FYM+100 kg N through inorganic source, recommended dose of N, 10 t of FYM+75 kg inorganic N, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM over control plot treatment was 166%, 156%, 147%, 136%, 125%, 113% higher respectively.

Increase in green cob weight with integrated nutrient management may be attributed to the improvement in soil physical and chemical properties, bulk density, aeration, porosity in addition to quick availability of nitrogen through combined application of farmyard manure and urea. Saha and Mondal (2006) also reported that there was a significant increase in green cob weight with the application of 75% RDF+farmyard manure over application of 100% RDF.

3.2.5. Baby cob weight

Baby cob weight is the weight of the baby corn without husk. It is the most important parameter for the yield of baby corn crop and contributes towards the final baby corn yield. Data related to average baby cob weight is presented in the Table 2. After statistical analysis it is concluded that treatments having 5 t of FYM+100 kg inorganic N and 100% recommended dose of N were found to be superior to all the other treatments and produced statistically similar baby cob weight.

Moreover, treatment 10 t of FYM+75 kg N recorded significantly better baby cob weight than all the other treatments having 15 t of FYM+50 kg inorganic N ha^{-1}, 20 t of FYM+25 kg inorganic N ha^{-1}, 25 t of FYM and control plot treatment but was at par with the recommended dose of N. Further, 15 t of FYM+50 kg inorganic N ha^{-1} was observed to be higher in attaining more baby cob weight than 20 t of FYM+25 kg inorganic N ha^{-1}, 25 t of FYM and control plot treatment Further, significantly more baby corn weight was produced by the 20 t of FYM+25 kg inorganic N over 25 t of FYM and control plot treatment. 25 t of FYM is statistically superior in attaining baby corn weight than control plot treatment. Significantly lower baby cob weight than all the other treatments was recorded with control plot treatment. A percent increase of 158%, 156%, 143%, 130%, 123% and 116% was observed in baby cob weight with the application of 5 t of FYM+100 kg inorganic N, recommended dose of N, 10 t of FYM+75 kg inorganic N, 15 t of FYM+50 kg inorganic N ha^{-1}, 20 t of FYM+25 kg inorganic N ha^{-1}, 25 t of FYM respectively over the control plot treatment.

Increase in baby cob weight with integrated nutrient management may be attributed to the improvement in soil physical and chemical properties, bulk density, aeration, porosity in addition to quick availability of nitrogen through combined application of farmyard manure and urea. Saha and Mondal (2006) also reported that there was a significant increase in green cob weight with the application of 75% RDF +farmyard manure over application of 100% RDF.

3.2.6. Baby corn yield

Yield is a major criterion for judging and comparing the efficiency of different treatments in any particular experiment. It is the result of all the growth and yield parameters as affected by various treatments. According to the data presented in the Table 2, all the treatments, where nitrogen was applied through organic or inorganic sources, have significantly affected the baby corn yield than control treatment. Further, highest baby corn yield was obtained with 5 t of FYM+100 kg inorganic N (19.31 q ha^{-1}), which was significantly better than all other treatments except, treatments where recommended dose of nitrogen (i.e. 125 kg ha^{-1}) was applied was statistically at par with the treatment 5 t of FYM+100 kg inorganic N. Moreover, recommended dose of nitrogen significantly improved the baby corn yield over all other treatments except, the application of 10 t of FYM+75 kg inorganic N where it failed to attain statistical significance.

Among rest of the treatments, 15 t of FYM+50 kg inorganic N produced significantly higher baby corn yield than 20 t of FYM+25 kg inorganic N over the 25 t of FYM and control plot treatments. Further, application of 20 t of FYM+25 kg inorganic N was significantly better over 25 t of FYM and control plot treatments. The increase in yield of baby corn with application of 5 t of FYM+100 kg N through inorganic source, recommended dose of N, 10 t of FYM+75 kg inorganic N, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM respectively over control plot treatment was 211%, 202%, 200%, 178%, 160%, 135% higher, respectively.

The higher baby corn yield with integrated nutrient management practices may be due to the favourable soil physicochemical properties like soil structure, water-holding capacity and synchronized release of plant nutrients throughout the crop growth period, which increased the yield contributing characters like cob length, cob girth, baby corn weight etc. hence, ultimately increased the baby corn yield. Similar trend of result of baby corn yield was also given by Kumar et al*.* (2009).

3.2.7. Fodder yield

Fodder yield is the integrated result of almost all the growth factors like plant height, dry matter accumulation, leaf area index and number of leaves per plant. It is an important parameter for judging the ultimate performance of a crop. According to data presented in table 2, all the treatments where nitrogen was applied whether through organic or inorganic sources, have significantly affected the fodder yield than control treatment. Further, highest yield (312.33 q ha^{-1}) was obtained with treatment in which nitrogen was applied through 5 t of FYM and remaining 100 kg through inorganic fertilizer to meet the nitrogen requirement of the crop which was found to be at par with the recommended dose of fertilizer.

Moreover, the treatment where recommended dose of N fertilizer (i.e.125 N kg ha^{-1}) was applied, significantly improved the fodder yield over 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N over the 25 t of FYM and control plot treatments except, the treatment having 10 t of FYM+75 kg inorganic N where it failed to attain statistical significance and similar results were obtained.

Among rest of the treatments, 15 t of FYM+50 kg inorganic N ha^{-1} produced significantly higher fodder yield than 20 t of FYM+25 kg inorganic N ha^{-1} over the 25 t of FYM and control plot treatments. Further, treatment having 20 t of FYM+25 kg inorganic N was significantly better over the treatment having 25 t of FYM and control plot treatment. The increase in fodder yield with 5 t of FYM+100 kg inorganic N, recommended dose of N, 10 t of FYM+75 kg inorganic N, 15 t of FYM+50 kg inorganic N, 20 t of FYM+25 kg inorganic N, 25 t of FYM over control plot treatment was 176%, 168%, 163%, 151%, 136%, 118% higher respectively.

Increased fodder yield with integrated nutrient management might be due to the better soil conditions created with the incorporation of farmyard manure which resulted in regular supply of plant nutrients to the plants and increased buffering capacity of soil and hence result in increased fodder yield. Similar trend of results was also recorded by Kumar et al. (2008).

3.3. Benefit:cost ratio

Benefit:Cost ratio expresses the extent of benefit or profit earned by applying a particular treatment over its cost of cultivation. According to the data given in the Table 3, it is revealed that maximum benefit:cost ratio of 3.24 was obtained where 5 t of FYM+100 kg of inorganic N was applied, next followed by the application of 10 t of FYM+75 kg of inorganic N with B:C ratio of 3.10. However, value of B:C ratio observed with treatment where 100% of recommended dose of N was applied, remained lower than the treatment having 5 t of FYM+100 kg of inorganic N and was almost similar to application of 5 t of FYM+100 kg of inorganic N, but higher than all the other treatments.

Moreover, B:C ratio of treatment having 15 t of FYM+50 kg N was noted to be higher than the treatment having 20 t of FYM+25 kg inorganic N. In the similar way, the B:c of treatment containing 20 t of FYM+25 kg inorganic N was observed higher than the treatment containing 25 t of FYM. However, the B:C of control plot treatment was observed minimum than all other treatments. Similar results of B:C ratio were also obtained by Rakib et al. (2011).

Table 3: Effect of integrated nutrient management on benefit:cost ratio of baby corn (*Zea mays* L.)

Treatment	Benefit: Cost			
	Total cost	Total income	Net profit	B:C
Control	1.43	7.15	3.79	32.7
100% RDN	3.00	8.94	5.11	51.2
5 t of FYM+100 kg inorganic N ha^{-1}	3.00	9.13	5.27	54.3
10 t of FYM+75 Kg inorganic N ha^{-1}	3.00	8.75	5.01	48.1
15 t of FYM+50 Kg inorganic N ha^{-1}	2.80	7.96	4.73	44.4
20 t of FYM+25 kg inorganic N ha^{-1}	2.37	7.73	4.53	40.9
25 t of FYM ha^{-1}	1.89	7.47	4.06	37.1
SEm±	0.06	0.07	0.07	1.08
C D (p=0.05)	0.19	0.21	0.19	3.19

Selling Cost of one kg of baby corn (without husk)=50 ₹; Selling Cost of one quintal green fodder=130 ₹; Cost of inorganic and organic manures; Urea=5.76 ₹ kg^{-1}, FYM=0.50 ₹ kg^{-1}

4. Conclusion

Integration of 5 t of FYM with 100 kg inorganic N ha^{-1} came out to be the best, which was having comparable results with recommended dose of nitrogen i.e. 125 kg ha^{-1}. Further, the above said treatment gave maximum profit, which is evident from superior B:C ratio.

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