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Effect of Organic and Inorganic Nutrient Management on Growth and Yield of Baby Corn (*Zea mays* L.) High Density Planting System under Prayagraj Conditions

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ABSTRACT

A field experiment was conducted at the Crop Research Farm (CRF), Department of Agronomy, Naini Agricultural Institute, Sam Higginbottom University of *Zaid* season 2020. The experiment comprised of ten treatments of different combinations of organic and inorganic nutrient management replicated thriceina Randomized Block Design. The main objective of the experiment was to evaluate the Influence of organic and inorganic nutrient management on growth and yield of baby corn (*Zea mays* L.) Prayagraj condition. The three level of nitrogen levels throw organic and inorganic N_1- 100% Nitrogen through Urea, N_2 -75% Nitrogen through Urea + 25% Nitrogen through FYM and N_3 - 50% Nitrogen through Urea +50% Nitrogen through FYM. Where-as three levels of high density planting system include like S_1- 25 x 15cm, S_2- 35 x 15cm and S_3- 45 x 15 cm. From the present investigation it may be concluded that the profitable production of baby corn can be secured by 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm (T_9).

Key words : *Growth, Yield, Organic, Inorganic nutrient and high density planting system*

Introduction

Maize is one of the most important cereal crops next to rice and wheat in world agriculture economy both as food for men and feed for animals. It has high yield potential, there is no crop on earth which has so immense potentiality and that is why it is called queen of cereals. Its botanical name is *Zea mays* L. belonging to the family Gramineae, sub family Poaceae and chromosome number is 20 (2n). Christopher Columbus reported that maize was cultivated in Halti, where it was named "mahiz". He carried maize from America to Europe and later it was carried by Portuguese and others Europeans to Africa and Asia, during 16th and 17th centuries. Already, this crop has been developed into a multi dollar business in foreign countries (Thailand, Taiwan, Singapore, Malaysia, USA, Canada and Germany) because of its potential as a value added product for export and a good food substitute. During recent times, its potentiality has been extended to the field of vegetable production (Mugalkhod *et al.*, 2011). In India, cultivation of baby corn is a recent development and its industry is still at a juvenile stage. Its cultivation is only now picking up seriously in Meghalaya, Western UP, Haryana, Maharashtra, Karnataka and Andhra Pradesh. In India, maize (*Zea mays* L.) is grown on an area of 9.43 m/ha, with production and productivity of 24.35 mt and 2583 kg/ha, respectively (GOI, 2014). Baby corn

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grown for vegetable purpose is successful in countries like Thailand, Taiwan, Srilanka and Burma. It has been developed into a multi-dollar business because of its potential as a value-added product for export and a good food substitute.

Baby corn yield is increased by using inorganic fertilizers, but the cost of production goes up and there are potentially harmful impacts on the environment. Therefore, using nutrients wisely from both chemical and organic sources will keep the ecosystem sustainable for future generations (Dadarwal *et al.,* 2009). The fertility status is diminished with uncertain soil health when organic fertilizers are used without the addition of organic matter. In comparison to inorganic fertilizers, organic manures like FYM are recognized to sustainably maintain soil productivity. This organic manure serves as a nutrient store, primarily for the micronutrients potassium, nitrogen, and phosphorus. In addition to its nutritional value, FYM boost the soil's capacity to absorb cations and anions, notably phosphates and nitrates. In the current environment, where the demand for cereal crops and concerns related to peoples' livelihoods have maintained national importance, the use of inorganic fertilizers for expanding grain output is unavoidable. However, over time, this has decreased the soil's fertility. The only way out of this hopeless situation is to establish sustainable and nutrient-balanced agricultural practices through organic farming, which would significantly enhance cereal crop output without endangering the environment's limited resources. The use of organic manures and bio-fertilizers in vegetable cultivation is rising as a substitute for chemical inputs. Improving soil structure and microbial biomass can be achieved without using mineral fertilizers by using organic manure (Imnaakum *et al.,* 2021). (Kumar *et al.,* 2018). Additionally, compared to typical grain maize, growing baby corn might result in at least a twofold return for the farmer (Singh *et al.,* 2011).

Plant density is one of the most crucial factors affecting grain production and other agronomic characteristics of maize among the several agronomic procedures. Each crop has a preferred plant density. Although single-plant productivity rises with low plant densities, yield per unit area falls. In contrast, an excessive density may exacerbate competition and reduce yield. Since maize lacks the ability to tiller, which allows it to respond to changes in plant stand, plant density is particularly crucial in this crop. Maximum plant density promotes efficient solar radiation absorption, which effects leaf area, solar radiation absorption and use, and ultimately corn dry matter accumulation and biomass output (Moosavi *et al*., 2012). The cultivation of plants at their ideal density will result in a greater yield since it has a beneficial impact on the crop yield components (Widdicombe and Thelen, 2002).

The following objectives have been undertaken to study the "Effect of organic and inorganic nutrient management on growth and yield of baby corn (*Zea mays* L.) high density planting system under prayagraj condition"

Materials and Methods

The current study was carried out in the Crop Research Farm, Department of Agronomy, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj, during the *Zaid* season 2020, (U.P.). The experimental field is situated on the left side of the Prayagraj-Rewa Road, about four kilometers from Prayagraj city and close to the Yamuna River, at 25.57^{o} N latitude, 87.19^{o} E longitude and at an altitude of 98m above mean sea level. The subtropical region of Uttar Pradesh, where Prayagraj is located, has scorching summers and nice winters. The region's typical temperature ranges from 23°C to 38°C, seldom falling below 3°C or 4°C. The relative humidity levels range from 28.57% to 95%. In this location, the average annual rainfall is 1050 mm. The soil chemistry analysis revealed a sandy loam texture with a pH of 7.20, low amounts of organic carbon (0.83 percent) and potassium (208.8 kg/ha), and a low quantity of accessible phosphorus (17.2 kg/ha). The soil was electrically conductive and had a conductivity of 0.34 dS/m. For each of the nine treatment combinations, three replications were employed. The therapy details and treatment combinations are shown in Tables 1 and 2, respectively. Organic, inorganic nutrient management and crop spacingwere maintained according to the treatment combinations. Plant height (cm) at harvest, dry weight at harvest, number of cobs/plant, weight of cob (g), baby corn yield (t/ha) and fodder yield (t/ha) were all successfully measured, and an economic analysis of each treatment was completed to determine the best treatment combination for baby corn cultivation.

Table 1. Treatment details

Nitrogen levels through organic and inoganic (N): Three levels	N_1	100% Nitrogen through Urea
	N_2	75% Nitrogen through Urea + 25% Nitrogen through FYM
	N_3	50% Nitrogen through Urea +50% Nitrogen through FYM
High density planting system cop spacing (S): Three levels	S_1	25 cm x 15 cm
	S_2	35 cm x 15 cm
	S_3	45 cm x 15 cm

Table 2. Treatment combinations

Treatment symbol	Treatment combinations Symbol	Treatment combinations
T_1	N_0B_0	Farmers practice- RDF (120:60:40 kg/ha N, P and K) spacing 60 x 25 cm
T_2	N_1B_1	100% Nitrogen through Urea+ 25 x 15 cm
T_3	N_1B_2	100% Nitrogen through Urea + 35 x 15 cm
T_4	N_1B_3	100% Nitrogen through Urea + 45 x 15 cm
T_5	N_2B_1	75% Nitrogen through Urea + 25% Nitrogen through FYM + 25 x 15 cm
T_6	N_2B_2	75% Nitrogen through Urea + 25% Nitrogen through FYM + 35 x 15 cm
T_7	N_2B_3	75% Nitrogen through Urea + 25% Nitrogen through FYM + 45 x 15 cm
T_8	N_3B_1	50% Nitrogen through Urea + 50% Nitrogen through FYM + 25 x 15 cm
T_9	N_3B_2	50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm
T_{10}	N_3B_3	50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm

Results and Discussion

Growth parameters

Plant height (cm)

Table 3 shows organic, inorganic nutrient management and crop spacingon plant height at harvest. The Data indicated that spacing had significant impact on plant height during the crop growth period. Application of T10- 50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm significantly influenced the plant height in baby corn at 45 DAS. The maximum plant height (177.01 cm) was recorded in T10- 50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm, which was statistically at par with T2,T5,T6,T8,T9 and minimum plant height (92.94) was recorded in application of T_3 :100% Nitrogen through Urea + 35 x 15cm . Application of Fe enhances photosynthesis, activates several enzymes, and aids in assimilate transport to the stem. The physiology and morphology of plants are greatly influenced by bio fertiliser. Foliar spraying of Fe drastically reduced plant height (Zayed *et al.* 2011). A similar finding was also made by (Akongwubel *et al.,* 2012). With an increase in organic manure rates, they saw a considerable improvement in maize plant height and leaf area index. Bio fertilisers provide the necessary nutrients for promoting healthy development and physiological processes in the plant system. Plant height, leaf area index, and dry matter output are all much greater when the rate of bio fertiliser application is increased. (Igua *et al.,* 2009) and both saw a similar outcome (Channal, 2017). Higher plant height may be caused by enough room, nutrients, and sunshine being available, which drove the plants to grow vertically. The current findings closely resemble those of Almaz *et al.* (2017); Yahia and Hussein (2017); Mahapatra *et al.* (2018); Qodliyati *et al.* (2018); Ojha *et al.* (2018), and Ganvit *et al.* (2019).

Dry weight of plant (g)

Application of T9 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm significantly influenced the dry weight in Table 3 shows organic, inorganic nutrient management and crop spacing on dry weight per plant at harvest. The Data indicated that, baby corn at 45 DAS. The maximum dry weight (70.07 g) was recorded in T9 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm were statically at par with T8 and lowest dry weight (60.17 g) was recorded in Farmers practice- RDF (120:60:40 kg/ha N, P and K) + spacing 60 x 25 cm. The therapies did not differ significantly from one another. When organic manures were applied, the physico-chemical characteristics of the soil

Table 3. Effect of organic, inorganic nutrient management and crop spacing on growth parameters of baby Corn

Treatment details	Growth Parameters	
	Plant height (cm)	Plant dry weight (g/plant)
Farmers practice- RDF (120:60:40 kg/ha N, P and K) spacing 60 x 25 cm	153.66	63.31
100% Nitrogen through Urea+ 25 x 15 cm	171.69	61.84
100% Nitrogen through Urea + 35 x 15 cm	92.94	63.57
100% Nitrogen through Urea + 45 x 15 cm	126.51	60.94
75% Nitrogen through Urea + 25% Nitrogen through FYM + 25 x 15 cm	168.06	63.52
75% Nitrogen through Urea + 25% Nitrogen through FYM + 35 x 15 cm	163.03	63.99
75% Nitrogen through Urea + 25% Nitrogen through FYM + 45 x 15 cm	157.55	68.17
50% Nitrogen through Urea + 50% Nitrogen through FYM + 25 x 15 cm	160.67	69.33
50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm	165.70	70.07
50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm	177.01	60.17
F Test	S	S
SEd. (+)	2.064	1.788
CD (P = 0.05)	4.375	3.790

may have improved, giving the soil a favorable structure for root growth and soil enzymes (which continue to decompose organic matter in the soil to release nutrients and make them available near the rhizosphere for absorption by plant roots, thus improving quality) (Chaoui *et al.,* 2003). Additionally, an increase in plant metabolism that appears to have encouraged meristematic activities that led to apical development might be blamed for the effect of organic fertilization by vermicompost on LAI. This outcome is consistent with what Atarzadeh and colleagues discovered (2013). The ultimate effect of photosynthetic activities is dry weight. The amount of sunlight that a plant gets determines how efficiently the photosynthesis process works and how many photosynthetic are produced. Larger plant organs will result from increased photosynthetic activity, which will also increase the dry weight of plants. According to Shah and Ahmad (2006) Meena *et al.* (2012), Ghimire *et al.* (2013), Kour *et al.* (2017); Kumar *et al.* (2014) and Shahid *et al.* (2016), Wailare and Kesarwani, and others, proper nutrition and spacing promote higher vegetative development and more sunshine to plants.

Yield parameters

Number of cobs per plant

The information on the number of cobs per plant impacted by treatments is reported in a table for in general. The number of cobs per plant rose with crop stage progression regardless of treatment and peaked at harvest. At 60 DAS, the number of baby corn cobs per plant varied depending on the treatment combinations. At 60 DAS, Number of cobs/plant was found significant and highest Number of cobs/plant (1.67) was recorded in T9 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm and lowest Number of cobs/plant (1.20) was recorded in T10 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm. By supplying the crop with the nutrients it needs from the beginning and increasing the supply of N, P, and K in a more synchronized way at the treatment receiving an integrated supply of nutrients from organic manure and inorganic fertilizer, which was expressed in terms of plant height, cobs per plant, cob girth, cob length, and cob weight with and without husk by virtue of inorganic fertilizer, chemical fertilizer and integrated use of fertilizer did significantly improve the overall growth of the In accordance with Singh *et al.* (2015). Findings, increased availability of photosynthetic, metabolites, and nutrients to develop reproductive structures appears to have led to an increase in the number of cobs/plant, length of cobs, weight of cobs, and yield of cobs with these integrated nutrient management treatments similar result found Wailare and Kesarwani (2017) and Kour *et al.* (2017).

Weight of cob (without husk) (g)

The data provided on length of cobs/plant (cm) without husk affected by treatments are presented in Table 4. In general the length of cobs/plant (cm) without husk differed with the advancement in crop stage, irrespective of the treatment and reached maximum at the time of harvest. The Length of cobs/plant (cm) with and without husk of Baby corn was recorded at 60 DAS differed significantly with treatment combinations. At 60 DAS, length of cobs/plant was found significant and highest Length of cobs/plant (cm) without husk (22.31 cm) was recorded in T_9: 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm and lowest length of cobs/plant without husk (10.47 cm) was recorded in Farmers practice- RDF (120:60:40 kg/ha N, P and K) + spacing 60 x 25 cm.

Weight of cob (with husk) (g)

Table 4 shows bio-fertilizer and organic manure on weight of cob (with husk).Shows organic, inorganic nutrient management and crop spacingon weight of cob (with husk). The data revealed that various treatments of the highest, Cob weight (g) with husk recorded at harvest stage. The data shown that there was a significant effect among treatments. At 60 DAS, length of cobs/plant was found significant and highest Length of cobs/plant (cm) with husk (44.41 cm) was recorded in T_9: 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm and lowest Length of cobs/plant with husk (30.36 cm) was recorded in Farmers practice- RDF (120:60:40 kg/ha N, P and K) + spacing 60 x 25 cm. By supplying the crop with the nutrients it needs from the beginning and increasing the supply of N, P, and K in a more synchronized way at the treatment receiving an integrated supply of nutrients from organic manure and inorganic fertilizer, which was expressed in terms of plant height, cobs per plant, cob girth, cob length, and cob weight with and without husk by virtue of inorganic fertilizer, chemical fertilizer and integrated use of fertilizer did significantly improve the overall growth of the In accordance with Singh *et al.* (2015), findings, increased availability of photo-synthases, metabolites, and nutrients to develop reproductive structures appears to have led to an increase in the number of cobs/plant, length of cobs, weight of cobs, and yield of cobs with these integrated nutrient management treatments, similar result found Wailare and Kesarwani (2017) and Kour *et al.*(2017).

Cobs yield (q/ha) with and without husk

The data obtained on weight of cobs yield (kg/ha) with and without husk affected by treatments are presented in Table 4. In general the weight of cobs yield (kg/ha) with and without husk differed with

Table 4. Effect of organic, inorganic nutrient management and crop spacing on growth parameters of baby Corn

Treatment details	Yield Parameters					
	No. of cobs/ plant	Cob length with husk (cm)	Cob length without husk (cm)	Cob Yield with husk (q/ha)	Cob Yield without husk(q/ha)	Fodder yield (t/ha)
Farmers practice- RDF (120:60:40 kg/ha N, P and K) spacing 60 x 25 cm	1.27	30.66	10.47	117.3	41.3	09.70
100% Nitrogen through Urea+ 25 x 15 cm	1.33	39.45	21.53	141.0	44.0	19.00
100% Nitrogen through Urea + 35 x 15 cm	1.40	32.60	13.31	140.0	42.9	15.13
100% Nitrogen through Urea + 45 x 15 cm	1.47	31.53	11.46	148.1	40.6	15.27
75% Nitrogen through Urea + 25% Nitrogen through FYM + 25 x 15 cm	1.53	37.53	18.97	182.3	43.3	19.13
75% Nitrogen through Urea + 25% Nitrogen through FYM + 35 x 15 cm	1.40	34.23	17.44	168.2	43.6	17.77
75% Nitrogen through Urea + 25% Nitrogen through FYM + 45 x 15 cm	1.47	32.40	15.37	159.3	40.6	15.63
50% Nitrogen through Urea + 50% Nitrogen through FYM + 25 x 15 cm	1.60	33.01	16.37	168.3	41.0	16.77
50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm	1.67	44.41	22.31	239.1	46.9	22.53
50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm	1.20	35.83	18.10	175.7	39.3	18.57
F Test	S	S	S	S	S	S
SEd. (+)	2.064	0.84	0.39	0.61	0.16	0.28
CD (p= 0.05)	4.375	2.50	1.16	1.81	0.47	0.84

Fig. 1. A and B at sowing time and after tagging view. C is detassiling work and D at observation to be recorded during harvest

the advancement in crop stage, irrespective of the treatment and reached maximum at the time of harvest. The weight of cobs yield (kg/ha) with and without husk of baby corn was recorded at 60 DAS differed significantly with treatment combinations. At 60 DAS, weight of cobs yield was found significant and highest weight of cobs yield (q/ha) with husk (239.1 q/ha) and without husk (46.9 kg/ha) was recorded in T9 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm and lowest Weight of cobs/plant (cm) with husk (117.3 q/ha) was recorded in Farmers practice- RDF (120:60:40 kg/ha N, P and K) + spacing 60 x 25 cm. and without husk (39.3 q/ha) was recorded in T10 : 50% Nitrogen through Urea + 50% Nitrogen through FYM + 45 x 15 cm. Chemical fertilizer and integrated use of fertilizer did bring about significant improvement in overall growth of the crop by providing needed nutrients from initial stage and increase in supply of N, P and K in more synchronize way at the treatment receiving integrated supply of nutrient from organic manure along with inorganic fertilizer and which expressed in terms of plant height, cobs per plant, cob girth, cob length, cob weight with and without husk by virtue of increased photosynthetic efficiency. Thus, greater availability of photosynthetic, metabolites and nutrients to develop reproductive structures seems to have resulted in increased number of cobs/plant, length of cobs, weight of cobs and yield of cobs with these integrated nutrient management treatments which coincides with results of Shah and Ahmad (2006), Ghimire *et al.* (2013); Lone *et al.* (2013); Kumar *et al.* (2014); Ukonze *et al.* (2016) and Kour *et al.* (2017).

Conclusion

On the basis of results obtained in present investigation, it is concluded that the profitable production of baby corn can be secured by 50% Nitrogen through Urea + 50% Nitrogen through FYM + 35 x 15 cm (T_9). These practices may be passed on to the farmers for obtaining higher returns in this agro-climatic zone. It has also recorded the maximum gross return, net return and benefit cost ratio.

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References

Akongwubel, A. O., Ewa, U. B., Prince, A., Jude, O., Martins, A., Simon, O. and Nicholas, O. 2012. Evaluation of agronomic performance of maize (*Zea mays* L.) under different rates of poultry manure application in an ultisol of Obubra, cross river state, Nigeria. *International Journal of Agriculture and Forestry.* 2(4): 138-144.

Almaz, M. G., Halim, R. A. and Martini, M. Y. 2017. Effect of Combined Application of Poultry Manure and Inorganic Fertilizer on Yield and Yield Components of Maize Intercropped with Soybean. *Pertanika Journal of Tropical Agricultural Science.* 40(1) : 856-860.

Channal, B. K. 2017. *Effect of organic and inorganic sources of nutrients on soil fertilitand productivity of maize* (*Zea mays* L.). (Doctor of science), University of Agriculture Science, Dharwad.

Chaoui, H.I., Zibilske, L.M. and Ohno, T. 2003. Effects of earthworm casts and compost on soil microbial activity and plant nutrient availability. *Soil Biol. Biochem.* 35 : 295-302.

Dadarwal, R.S., Jain, N. K. and Singh, D. 2009. Integrated Nutrient Management in Baby Corn (*Zea mays* L.). *Indian Journal of Agricultural Sciences.* 79(12) : 1023-1025.

Ghimire, S., Shakya, S.M. and Srivastava, A. 2013. Effects of organic manures and their combination with urea on sweet pepper production in the Mid-hills. *The Journal of Agriculture and Environmen*. 14 : 23-30.

Igua, P., Huasi, L., Goroka, E. H. P. and Guinea, P. N. 2009. Effect of chicken manure, *Tithonia diversifolia* and *Albizzia spp* on maize plant height and dry matter production–lessons learnt in the eastern highlands of PNG. Paper presented at the *17th International Farm Management Congress, Bloomington/Normal, Illinois, and USA.*

Imnaakum Longchar, Joy Dawson and Lipi Rina 2021. Effect of plant geometry and organic manure on growth and yield of baby corn (*Zea mays* L.). *The Pharma Innovation Journal.* **10**(11): 892-895.

Kumar, P., Kumar, R., Singh, S. K. and Kumar, A. 2014. *Agriways.* 2(2) : 89-93.

Kumar, R. and Bohra, J. S. 2014. Effect of NPKS and Zn application on growth, yield, economics and quality of baby corn. *Archives of Agronomy and Soil Science*. 60(9): 1193-1206.

Kumar, V.M., Velayutham, A., Kumar, S. N. and Vasanthi, D. 2018. Influence of Different Organic Manures on the Growth and Yield of Baby Corn. *International Journal of Advances in Agricultural Science and Technology.* 5(7) : 167-174.

Lone, A. A., Allai, B. A. and Nehvi, F. A. 2013. Growth, yield and economics of baby corn (*Zea mays* L.) as influenced by Integrated Nutrient Management (INM) Practices. *African Journal of Agricultural Research*. 8(37) : 4537-4540.

Mahapatra, A., Barik, A. K. and Mishra, G. C. 2018. Integrated nutrient management on babycorn (*Zea mays* L.). *International Journal of Bio-resource and Stress Management.* 9(1) : 044-048.

Meena, S.R., Kumar, A., Jat, B.P., Meena, B.P., Rana, D.S. and Idanani, L.K. 2012. Influence of nutrient sources on growth, producyivityand economics of baby corn (*Zea mays* L.)-Potato (*Solanum tuberosum*)-mung bean (*Vigna radiate*) cropping system. *Indian Journal of Agronomy.* 57(3) : 217-221.

Moosavi S.G. MOAZENI A. 2012. Effect of planting date and plant density on morphological traits, LAI and forage corn yield in second cultivation. *International Research Journal of Applied and Basic Sciences*. 3(1): 57-63.

Mugalkhod, A.S., Shivamurthy, D., Kumar, A. and Biradar, M.S. 2011. Yield components of baby corn (*Zea mays* L.) as affected by planting method and irrigation schedule under drip. *Plant Achives*. 11(1): 379-381.

Ojha, E., Adhikari, B., and Katuwal, Y. 2018. Nurient Management Trial on Foxtail Millet at Sundarbazar, Lamjung. *Journal of the Institute of Agriculture and Animal Science.* 35(1): 89-94.

Qodliyati, M., S. and Nyoto, S. 2018. Influence of spacing and depth of planting to growth and yield of arrowroot (*Marantha arundinacea*). *IOP Conf. Series: Earth and Environmental Science,* 142.

Sahid, R., S., Kanth, R., Hamid, S., Alie, B. A., Raja, W. and Dar, Z. A. 2016. Effect of Integrated Nutrient Management on Yield and Yield Attributes of Sweet Corn (*Zea mays* L. saccharata) Under Wet Temperate Conditions of Western Himalayas (India). *Journal of Experimental Agriculture International*. 13(2): 1-9.

Shah, Z.and Ahmad, M.I. 2006. Effect of integrated use of farm yard manure and urea on yield and nitrogen uptake of wheat. *Journal of Agricultural and Biological Science,* **1**(1) : 1990-6145.

Singh, A.K., Kumar, R., Bohra, J.S. and Kumawat, N. 2015. Fodder yield, nutrient uptake and quality of baby corn (*Zea mays* L.) as influenced by NPKS and Zn fertilisation. *Research on Crops.* 16(2): 243-249.

Singh, M. K., Singh, R. N. and Singh, V. K. 2011. Effect of organic and inorganic sources of nutrient on growth, yield, quality and nutrient uptake by baby corn (*Zea mays* L.) *Ann. Agric. Res.* 32(3&4): 93-99.

Ukonze, J. A., Akor, V. O. and Ndubuaku, U. M. 2016. Comparative analysis of three different spacing on the performance and yield of late maize cultivation in Etche local government area of Rivers State, Nigeria, *African J. Agri. Res*. 11(13) : 1187-1193.

Wailare, A.T. and Kesarwani, A. 2017. Effect of integrated nutrient management on growth and yield parameters of maize (*Zea mays* L.) as well as soil physicochemical properties. *Biomedical Journal of Scientific and Technical Research*. 1(2) : 1-6.

Widdicombe, W.D. and K.D. Thelen. 2002. Row width and plant density effects on corn grain production in the northern Corn Belt. *Agron. Journals*. 94 : 1020–1023.

Yahia, E. and Hussein, A. 2017. Effect of Plant Spacing on Growth and Yield Components of Two Sorghum (*Sorghum bicolor* L.) varieties Under Rain fed Conditions. *Indian Journal of Agricultural Sciences.* 65: 315-320.

Zayed, B. A., Salem, A. K. M. and Sharkawy, H. M. 2011. Effect of Different Micronutrient Treatments on and Fe on Rice (*Oriza sativa* L.) Growth and Yield under Saline Soil Conditions. *World J. Agric. Sci.* 7(2): 179-184.