EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON RABI MAIZE YIELD AND SUBSEQUENT SUMMER SESAME UNDER IRRIGATED CONDITIONS

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Abstract

The experimental field was flat, gradually sloping, and had a loamy sand texture with good drainage. At a depth of 0-15 centimetres, the soil in the experimental field was somewhat alkaline in reaction, had a low concentration of organic carbon and available N, a moderate concentration of available P2O5, and a high concentration of available K2O. Increases in plant height at 60 DAS, at harvest, and plant dry weight at harvest were observed in maize when 75% RDF + 25% RDN was applied via Vermicompost + NPK Consortium Soil application in the 2018-19, 2019-20, and pooled basis years; however, these results were not statistically significant for plant height at 30 DAS and plant dry weight at 30 DAS. The application of 75% RDF + 25% RDN through Vermicompost + NPK Consortium Soil increased the cob length, cob girth, number of grains per cob, and seed index of maize in both 2018-2019 and 2019-2020 on a pooled basis. Analysis of data from the 2018-19 and 2019-20 growing seasons, as well as a combined study of those two years, shows that integrated nutrition management treatments had no effect on the number of cobs per plant, harvest index, or shelling % of maize.

Keywords: *Integrated Nutrient, Management, Rabi Maize, Summer Sesame, Irrigated Conditions.*

1. Introduction

Three-sixths (782,000 metric tonnes) of the world's grain supply comes from maize, which is grown in numerous nations with a diverse range of soil, climate, biodiversity, and management practises. The United States of America (USA) is the world's leading producer of maize, accounting for around 35% of total output and serving as the main economic engine of the USA. Together, over 170 nations are producing roughly 1147.7 million tonnes of maize from an area of 193.7 million hectares, with an average productivity of 5.75 t/ha.[1]

India grows 9.60 million acres worth of maize, which produces 27.15 million tonnes at a yield of around 2.8 t/ha, making it the third most important cereal crop in the country after rice and wheat. [2-3]

Maize is used as a raw material in the production of thousands of industrial products, including starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceuticals, cosmetics, films, textiles, packages, papers, etc., making it both a staple food for humans and a high-quality animal feed.[4-5]

Oil accounts for 4%, carbohydrates for 70%, crude fibre for 2.3%, albuminoids for 10.4%, and ash for 1.4% in maize grains. There is a name for the protein found in maize: Zein. Vitamin A, nicotinic acid, riboflavin, and vitamin E are all found in high concentrations in maize grains. Like other grain crops, maize has several applications. People show a lot of enthusiasm about roasting green cobs and eating them. Maize flours and grains are used to make a variety of different types of cuisine, including chapaties. Poultry, swine, and other livestock may also benefit from feeding on it. Starch, oil, protein, alcohol, acetic acid, glucose, synthetic rubber, colours, resin, cosmetics, textile gum, paper industry, etc. all rely on it as a source of raw materials. Maize is significant because to its high reactivity to improved management practises and its remarkable adaptability to vastly diverse situations.[6-7]

2. Literature review

Dev (2019) The effects of organic and inorganic fertiliser levels on the growth and production of sweet corn (Zea mays L. saccharata) were tested during the kharif 2010 and 2011 growing seasons in the mild climate of Kashmir Valley. It was found that compared to the unfertilized control, the 75% (NPK) + FYM (4.5 t/ha) + bio-fertilizer application resulted in significantly higher plant height, leaf area index, and dry matter accumulation at 15-day intervals from sowing to harvest, crop growth rate, and relative growth rate at 7-day intervals from 15 DAS up to harvest.[8]

Hagh, E. D. and Rejali, F. (2018) In order to improve nutrient availability and increase crop yields, Integrated Nutrient Management (INM) incorporates both organic and inorganic fertilisers. Increasing agricultural yields in irrigated situations via the use of INM has been recognised as a sustainable and efficient technique. The goal of this study is to analyse the effects of INM on Rabi maize productivity and the subsequent summer sesame harvest.

Maize (Zea mays L.) is one of the most important grain crops grown during the Rabi season. It sees significant usage in the industrial, commercial, and agricultural spheres. One common oilseed crop that is planted after the Rabi season ends is summer sesame (Sesamum indicum L.). Food and a high-protein dinner are provided, and it also helps to diversify crop output..[9]

Chhetri, B. and Sinha, A. C. (2017) In a field experiment conducted by the Department of Agronomy at Anand Agricultural University in Gujarat, the effects of organic manure and inorganic fertilisers on the maize-chickpea cropping sequence were studied. In combination with the suggested dose of inorganic fertiliser (120-60-00 NPK kg/ha) and 20 kg sulphur in the form of gypsum, the results showed that a maize crop supplied with organic manure vermicompost at a rate of 2.5 t/ha achieved the highest dry matter accumulation/plant and leaf area/plant and leaf area index (LAI). Researchers in West Bengal conducted a field experiment on the sandy to sandy loam soil of the Instructional Farm at Uttar Banga Krishi Viswavidhyalaya in Pundibari during the pre-kharif season of 2015-16 to analyse how INM techniques affected an intercropping system based on maize.[10]

Iqbal, A. and Khan, H. Z. (2016) Irrigation is crucial in dry and semiarid areas because it ensures a steady supply of water for growing crops. However, the yield of irrigated crops may be diminished by insufficient soil nutrient levels. Improper nutrient management has the potential to negatively affect plant development, yield, and agricultural sustainability. INM offers a comprehensive approach to restoring proper nutrition by blending together organic and inorganic substances. Organic fertilisers boost soil fertility, enhance nutrient retention, and promote microbial activity, whereas inorganic fertilisers give nutrients to satisfy the crops' urgent demands.[11]

Jadav, V. M. and Chaudhari, P. P. (2015) Maize production and quality were studied in a field experiment conducted by scientists from Sher-E-Kashmir University of Agricultural Sciences and Technology of Kashmir in Shalimar, Jammu and Kashmir, during the kharif seasons of 2006 and 2007. Increases in recommended fertiliser dosages from 60% to 100%, FYM 10 to 30 t/ha, with biofertilizer Azotobacter + PSB seed treatment led to greater increases in yield and quality than did increases in doses with the other treatments.[12]

3. Methodology

Research on the impact of INM on rabi maize (Zea mays L.) yield and the subsequent impact on summer sesame (Sesamum indicum L.) under irrigated conditions was conducted throughout the 2018-19 and 2019-20 rabi–summer seasons."

3.1 Location of experiments

Anand Agricultural University at Anand, India's B. A. College of Agriculture's plot 34-A of the College Agronomy Farm was used for the experiment throughout the rabi and summer.

3.2 Varietal description

3.2.1 Maize

This study used maize from the GAYMH 3 Gujarat Anand Yellow Maize Hybrid 3 trial crop. The Main Maize Research Station of Anand Agricultural University in Godhra, Gujarat, has just published a new rabi-ready maize variety for the middle Gujarat Agro-climatic zone. For the rainfed situation of the tribal belt in the state of Gujarat, this is the first publicly available, single cross hybrid with early maturity. The hybrid shares the native varieties' orange flint grained cob.

3.2.2 Sesame

The Gujarat Til 3 (GT 3) variety of sesame was introduced in 2012 by the Agriculture Research Station at Amreli, Junagadh Agricultural University, and was thus used for this study. However, because to its great yield and extreme resilience to disease and pests, this cultivar is now widely cultivated over the whole state of Gujarat..

3.3 Experimental details

The following experimental procedures were conducted as part of the study titled "Effect of integrated nutrient management on yield of rabi maize and its residual effect on succeeding summer sesame (Sesamum indicum L.) Under irrigated condition:

Location: Anand Agricultural University, College Agronomy Farm, B. A. College of Agriculture, Anand, India

Season and Year: Summer in Rabi 2019 and 2020

Experimental Design: Three independent trials were set up in a Randomized Block Design (RBD). Thirty-six plots were used to assess the residual impact of twelve treatments given to rabi maize on the summer sesame crop that followed. The test plot became dormant throughout the kharif months.

4. Results

4.1 Effect of integrated nutrient management on nutrients content and uptake

Table 4.1 displays the results of a two-year, pooled analysis of the effect of integrated nutrition management treatment types on nitrogen concentrations in maize grain and stover.

The grain N content was found to be significantly higher (1.78, 1.79, and 1.79% N content) and the stover N content was found to be significantly higher (0.55, 0.56, and 0.56% N content). With the exception of T3, T9, and T11 throughout both years and T9 and T11 on a pooled basis, N content in grain was found to be consistent across all treatments. Stover's N content was found to be comparable across all treatments except T1, T2, T3, and T4 over years, and T7, T8, T9, and T11 across the two years as a whole.

Table 4.1: The effects of integrated nutrition management on maize's grain and stover nitrogen content

Treatments	**Nitrogencontent (%)**					
	Grain			**Stover**		
	2018-19	**2019-20**	**Pooled**	**2018-19**	**2019-20**	**Pooled**
T_1: 100 % RDF	1.39	1.38	1.39	0.46	0.44	0.45
T_2:100 % RDF+NPK Consortium(Seed treatment)	1.44	1.46	1.45	0.48	0.48	0.48
T_3:100 % RDF+NPK Consortium(Soil application)	1.63	1.64	1.63	0.47	0.48	0.48
T_4:75 % RDF+25 %RDNthrough FYM	1.15	1.16	1.15	0.49	0.49	0.49
T_5: 75 % RDF+25 %RDNthrough Castor cake	1.29	1.29	1.29	0.50	0.51	0.51
T_6: 75 % RDF+25 %RDNthrough Vermicompost	1.33	1.32	1.33	0.50	0.50	0.50
T_7:75 % RDF+25%RDNthrough FYM+NPK Consortium (Seed treatment)	1.21	1.24	1.23	0.52	0.52	0.52
T_8:75 %RDF+25%RDNthroughCastor cake+NPK Consortium(Seed treatment)	1.59	1.58	1.59	0.53	0.54	0.54
T_9:75 %RDF+25 %RDNthroughVermicompost + NPKConsortium (Seedtreatment)	1.69	1.69	1.69	0.53	0.54	0.53
T_{10}:75 %RDF+25 %RDNthrough FYM +NPK Consortium (Soilapplication)	1.55	1.53	1.54	0.51	0.51	0.51
T_{11}:75 % RDF+25 %RDNthrough Castorcake+NPK	1.72	1.73	1.72	0.52	0.52	0.52

Consortium(Soilapplication)							
T_{12}:75%RDF+25%RDNthroughVermicompost+NPKConsortium(Soilapplication)		1.78	1.79	1.79	0.55	0.56	0.56
S.Em.±	Y			0.015			0.005
	T	0.0525	0.0534	0.0374	0.018	0.019	0.012
	Y×T			0.053			0.019
CDat 5%	Y			NS			NS
	T	0.154	0.157	0.107	0.054	0.056	0.038
	Y×T			NS			NS
CV%		6.14	6.23	6.19	6.34	6.56	6.45

Table 4.2 displays the results of a two-year pooled analysis of the effect of integrated nutrient management treatment types on phosphorus concentrations in maize grain and stover.

Soil application T12 in 2018-19, 2019-20, and pooled significantly increased grain phosphorus content by 0.289, 0.291, and 0.290% P content, and stover phosphorus content by 0.183, 0.184, and 0.184% P content.. However, in 2018-19 and 2019-20, and with treatment T9 and T11 on pooled analysis, P content in grain was shown to be comparable across all treatments. In 2018-19, the stover P concentration was found to be similar across all treatments except for T8, T9, and T11. T9 and T11 in 2019-20, while T9 was on par with T11 in a pooled analysis of treatments.

Table 4.3 shows that, throughout both years and in aggregate, the integrated nutrient management treatments did not significantly affect the potassium concentrations in the maize grain or stover.

Table 4.2: INM's effect on maize grain and stover phosphorus concentrations

Treatments	**Phosphoruscontent(%)**					
	Grain			**Stover**		
	2018-19	**2019-20**	**Pooled**	**2018-19**	**2019-20**	**Pooled**
T_1: 100 % RDF	0.249	0.256	0.253	0.143	0.150	0.147
T_2:100 % RDF+NPK Consortium(Seed treatment)	0.257	0.267	0.262	0.143	0.144	0.144
T_3:100 % RDF+NPK Consortium(Soil application)	0.273	0.276	0.274	0.133	0.143	0.138
T_4:75 % RDF+25 %RDNthrough FYM	0.229	0.238	0.233	0.150	0.143	0.147
T_5: 75 % RDF+25 %RDNthrough Castor cake	0.236	0.241	0.238	0.150	0.143	0.147

T_6: 75 % RDF+25 %RDNthrough Vermicompost		0.250	0.252	0.251	0.153	0.153	0.153
T_7:75 % RDF+25%RDNthrough FYM+NPK Consortium (Seed treatment)		0.232	0.238	0.235	0.160	0.160	0.160
T_8:75 %RDF+25%RDNthroughCastorcake+NPK Consortium(Seed treatment)		0.274	0.275	0.274	0.173	0.167	0.170
T_9:75 %RDF+25 %RDNthroughVermicompost + NPKConsortium (Seedtreatment)		0.275	0.278	0.277	0.177	0.180	0.178
T_{10}:75 % RDF+25 %RDNthrough FYM +NPK Consortium (Soilapplication)		0.263	0.264	0.263	0.160	0.160	0.160
T_{11}:75 % RDF+25 %RDNthrough Castorcake+NPK Consortium(Soilapplication)		0.287	0.291	0.289	0.170	0.173	0.172
T_{12}:75 % RDF+25 %RDNthrough Vermicompost +NPK Consortium (Soilapplication)		0.289	0.291	0.290	0.183	0.184	0.184
S.Em.±	Y			0.0019			0.0015
	T	0.0072	0.0063	0.0048	0.0050	0.0052	0.0036
	Y×T			0.0067			0.0051
CDat 5%	Y			NS			NS
	T	0.021	0.019	0.014	0.015	0.015	0.010
	Y×T			NS			NS
CV%		4.778	4.143	4.466	5.498	5.721	5.611

Table 4.3: Maize grain and stover potassium concentrations and their relation to integrated nutrition management practices

Treatments	**Potassiumcontent (%)**					
	Grain			**Stover**		
	2018-19	**2019-20**	**Pooled**	**2018-19**	**2019-20**	**Pooled**
T_1: 100 % RDF	0.46	0.46	0.46	1.12	1.13	1.12
T_2:100 % RDF+NPK Consortium(Seed treatment)	0.46	0.47	0.47	1.12	1.14	1.13
T_3:100 % RDF+NPK Consortium(Soil application)	0.47	0.47	0.47	1.15	1.15	1.15
T_4:75 % RDF+25 %RDNthrough FYM	0.43	0.44	0.44	1.10	1.10	1.10
T_5: 75 % RDF+25 %RDNthrough Castor cake	0.45	0.46	0.45	1.11	1.12	1.11
T_6: 75 % RDF+25 %RDNthrough Vermicompost	0.45	0.46	0.45	1.12	1.12	1.12
T_7:75 % RDF+25%RDNthrough FYM+NPK Consortium (Seed treatment)	0.44	0.45	0.45	1.10	1.11	1.11
T_8:75 %RDF+25%RDNthroughCastor cake+NPK Consortium(Seed treatment)	0.47	0.48	0.48	1.14	1.14	1.14
T_9:75 %RDF+25 %RDNthroughVermicompost + NPKConsortium (Seedtreatment)	0.48	0.48	0.48	1.15	1.16	1.15
T_{10}:75 %RDF+25 %RDNthrough FYM +NPK Consortium (Soilapplication)	0.47	0.47	0.47	1.13	1.14	1.14
T_{11}:75 % RDF+25 %RDNthrough Castorcake+NPK	0.48	0.48	0.48	1.16	1.16	1.16

Consortium(Soilapplication)							
T_{12}:75 % RDF+25 %RDNthrough Vermicompost+NPK Consortium(Soil application)		0.48	0.48	0.48	1.17	1.17	1.17
S.Em.±	Y			0.00			0.01
	T	0.01	0.02	0.01	0.02	0.02	0.02
	Y×T			0.01			0.02
CDat 5%	Y			NS			NS
	T	NS	NS	NS	NS	NS	NS
	Y×T			NS			NS
CV%		4.97	5.99	5.51	3.44	3.28	3.36

Table 4.4 presents annual and pooled analysis data for nitrogen absorption (kg/ha) by grain and stover of maize for 2018-19 and 2019-20. Results show that N intake was significantly impacted by multiple integrated nutrition management treatments over the course of the years and when used together.

Nitrogen intake was improved by 75% RDF + 25% RDN through Vermicompost + NPK Consortium Soil application T12 in 2018-19 (101.65% by grain and 46.60% by stover), 2019-20 (103.79% by grain and 48.67% by stover), and on a pooled basis (102.72% by grain and 47.64% by stover). Grain N absorption in 2018-19, 2019-20, and 2019-20 was consistent with T3, T8, T9, T10, and T11 in pooled analysis. Stover maintained a steady intake of N throughout the pooled study's four years (2018-19, 2019-20, T9, and T11). Table 4.5 displays the cumulative and annual changes in phosphorus uptake by maize grain and stover as a result of INM treatments.

Table 4.4: Stover nitrogen uptake in maize as affected by integrated nutrient management

Treatments	Nitrogen uptake(kg/ha)					
	Grain			Stover		
	2018-19	2019-20	Pooled	2018-19	2019-20	Pooled
T_1: 100 % RDF	65.98	67.14	66.56	30.23	30.63	30.43
T_2:100 % RDF+NPK Consortium(Seed treatment)	69.80	72.24	71.02	33.30	34.17	33.73
T_3:100 % RDF+NPK Consortium (Soil application)	87.72	89.44	88.58	36.46	37.45	36.95
T_4:75 % RDF+25 %RDNthrough FYM	47.63	50.63	49.13	28.60	30.55	29.58
T_5: 75 % RDF+25 %RDNthrough Castor cake	60.75	60.96	60.86	33.16	34.42	33.79
T_6: 75 % RDF+25 %RDNthrough Vermicompost	61.55	62.85	62.20	33.65	34.00	33.82

T_7:75 % RDF+25%RDNthrough FYM+NPK Consortium (Seed treatment)		50.67	59.47	55.07	30.82	34.70	32.76
T_8:75 %RDF+25%RDNthroughCastor cake+NPK Consortium(Seed treatment)		87.23	87.05	87.14	40.85	41.90	41.38
T_9:75 %RDF+25 %RDNthroughVermicompost + NPKConsortium (Seedtreatment)		92.48	95.78	94.13	41.70	44.63	43.17
T_{10}:75 % RDF+25 %RDNthrough FYM +NPK Consortium (Soilapplication)		85.53	91.33	88.43	37.50	37.99	37.75
T_{11}:75 % RDF+25 %RDNthrough Castorcake+NPK Consortium(Soilapplication)		94.37	98.23	96.30	41.40	43.35	42.38
T_{12}:75 % RDF+25 %RDNthrough Vermicompost +NPK Consortium (Soilapplication)		101.65	103.79	102.72	46.60	48.67	47.64
S.Em.±	Y			1.56			0.78
	T	5.78	4.98	3.81	2.81	2.60	1.91
	Y×T			5.39			2.71
CDat 5%	Y			NS			NS
	T	16.95	14.60	10.87	8.24	7.64	5.46
	Y×T			NS			NS
CV%		13.27	11.02	12.16	13.44	11.96	12.70

4.2 Residual effect of integrated nutrient management on sesame

Tables 4.5 and 4.6 show the impacts of integrated nutrition management treatments on plant population per net plot at 20 DAS and at sesame harvest in 2019, 2020, and pooled basis. Tables show that the residual effect of several integrated nutrition management treatments on plant population in the sesame crop had no noticeable impact at 20 DAS and at harvest in 2019, 2020, or in the pooled study. This demonstrated that there were a consistent number of plants across all conditions.

Tables 4.7 and 4.8 show average sesame plant height at 30 DAS and harvest in 2019 and 2020., and show how these measurements were affected by previous integrated nutrition management treatments.

Table4.5: Integrated nutrition management interventions impact net plot plant populations 20 days after planting.

Treatments	**Plantpopulation/netplotat 20DAS**		
	2019	**2020**	**Pooled**
T_1: 100 % RDF	206.90	200.10	203.50

T_2:100%RDF+NPKConsortium(Seed treatment)		203.33	201.67	202.50
T_3:100 % RDF + NPK Consortium (Soil application)		201.03	203.07	202.05
T_4:75 % RDF+25%RDNthrough FYM		206.33	211.33	208.83
T_5:75 % RDF+25 %RDNthrough Castor cake		205.23	207.00	206.12
T_6: 75 % RDF + 25 % RDN through Vermicompost		204.57	204.67	204.62
T_7:75% RDF + 25%RDN throughFYM +NPK Consortium(Seedtreatment)		217.57	211.70	214.63
T_8:75%RDF+25%RDNthroughCastorcake+NPKConsortium (Seed treatment)		204.30	208.70	206.50
T_9: 75 % RDF + 25 % RDN throughVermicompost+NPKConsortium(Seed treatment)		203.00	206.33	204.67
T_{10}:75%RDF+25%RDNthroughFYM+NPK Consortium(Soilapplication)		206.80	213.67	210.23
T_{11}:75%RDF+25%RDNthroughCastorcake +NPKConsortium (Soilapplication)		212.50	209.73	211.12
T_{12}: 75 % RDF + 25 % RDN through Vermicompost + NPK Consortium (Soilapplication)		201.63	207.67	204.65
S.Em.±	Y			2.00
	T	6.21	7.56	4.89
	Y×T			6.92
CDat 5%	Y			NS
	T	NS	NS	NS
	Y×T			NS
CV%		5.22	6.32	5.80

Table 4.6: The effect of comprehensive nutrition management on plant population/net plot size at the following sesame harvest is uncertain.

Treatments	Plantpopulation/netplot at harvest		
	2019	2020	Pooled
T_1: 100 % RDF	201.57	194.10	197.84
T_2:100 %RDF+NPK Consortium (Seedtreatment)	197.33	195.67	196.50

T_3:100%RDF+NPKConsortium(Soilapplication)		194.13	197.07	195.60
T_4:75 % RDF+25%RDNthrough FYM		200.33	205.33	202.83
T_5:75 % RDF+25 %RDNthrough Castor cake		199.23	201.00	200.12
T_6:75 % RDF+25 %RDNthrough Vermicompost		198.29	198.67	198.48
T_7:75%RDF+25%RDNthroughFYM+NPK Consortium(Seedtreatment)		211.57	205.70	208.63
T_8:75%RDF+25%RDNthroughCastorcake+ NPKConsortium(Seedtreatment)		198.30	202.70	200.50
T_9:75%RDF+25%RDNthroughVermicompost +NPKConsortium(Seedtreatment)		197.00	200.33	198.67
T_{10}:75%RDF+25%RDNthroughFYM+NPK Consortium(Soilapplication)		200.80	207.67	204.23
T_{11}:75%RDF+25%RDNthroughCastorcake+ NPKConsortium(Soilapplication)		206.17	203.73	204.95
T_{12}:75%RDF + 25%RDNthroughVermicompost +NPKConsortium (Soilapplication)		194.40	201.67	198.03
S.Em.±	Y			1.98
	T	6.08	7.56	4.85
	Y×T			6.86
CDat 5%	Y			NS
	T	NS	NS	NS
	Y×T			NS
CV%		5.26	6.51	5.92

Table 4.7 shows that nutrient management treatments significantly affected plant height at harvest in 2019 and 2020, as well as in pooled findings. At harvest, 75 % RDF + 25% RDN via FYM + NPK Consortium (Soil application) (T10) had the highest plant height of 92.07, 92.03, and 92.05. However, it was not significantly different from treatments T4, T5, T7, T8, and T11 in 2019; T3, T4, T5, T7, T8, T11, and T12 in 2020; and T4, T7, and T8 pooled.

T1 [100% RDF] had considerably lower sesame plant height (73.33, 73.37, and 73.35 cm in 2019, 2020, and combined analyses).

Table 4.7: Integrated Nutrient Management and Sesame Plant Height 30 Days after Sowing

Treatments		**Plantheight(cm)at30 DAS**		
		2019	**2020**	**Pooled**
T_1: 100 % RDF		15.63	15.69	15.66
T_2:100%RDF+NPKConsortium(Seedtreatment)		15.69	15.71	15.70
T_3: 100 % RDF + NPK Consortium (Soil application)		15.77	15.60	15.68
T_4:75 % RDF+25%RDNthrough FYM		16.18	16.20	16.19
T_5:75 % RDF+25 %RDNthrough Castor cake		15.89	15.92	15.91
T_6:75 % RDF+25 %RDNthrough Vermicompost		15.52	15.93	15.72
T_7:75%RDF+25%RDNthroughFYM+NPK Consortium(Seedtreatment)		16.25	16.28	16.26
T_8:75%RDF+25%RDNthroughCastorcake+ NPKConsortium(Seedtreatment)		16.00	16.13	16.06
T_9: 75 % RDF+25%RDNthroughVermicompost +NPKConsortium(Seedtreatment)		16.08	15.87	15.98
T_{10}:75%RDF+25%RDNthroughFYM+NPK Consortium(Soilapplication)		16.20	16.40	16.30
T_{11}:75%RDF +25%RDNthroughCastorcake+ NPKConsortium(Soilapplication)		16.08	16.13	16.10
T_{12}:75%RDF+25%RDNthroughVermicompost +NPKConsortium (Soilapplication)		15.95	16.07	16.01
S.Em.±	Y			0.15
	T	0.56	0.50	0.38
	Y×T			0.53
CDat 5%	Y			NS
	T	NS	NS	NS
	Y×T			NS
CV%		6.09	5.43	5.77

Table 4.8: The impact of integrated nutrient management practises on the final sesame crop's plant height

Treatments	**Plantheight(cm)at harvest**		
	2019	**2020**	**Pooled**
T_1: 100 % RDF	73.33	73.37	73.35
T_2:100 %RDF+NPK Consortium (Seedtreatment)	78.37	78.47	78.42
T_3:100 %RDF+NPK Consortium (Soilapplication)	79.04	82.57	80.80
T_4:75 % RDF+25%RDNthrough FYM	88.41	88.77	88.59
T_5:75 % RDF+25 %RDNthrough Castor cake	84.56	84.93	84.75
T_6:75 % RDF+25 %RDNthrough Vermicompost	81.27	81.63	81.45
T_7:75%RDF+25%RDNthroughFYM+NPK	89.68	89.83	89.76

Consortium(Seedtreatment)				
T_8:75%RDF+25%RDNthroughCastorcake+ NPKConsortium (Seedtreatment)		86.63	87.30	86.97
T_9:75%RDF+25%RDNthroughVermicompost+ NPKConsortium(Seedtreatment)		80.99	81.10	81.05
T_{10}:75%RDF+25%RDNthroughFYM+NPK Consortium(Soilapplication)		92.07	92.03	92.05
T_{11}:75%RDF+25%RDNthroughCastorcake+ NPKConsortium(Soilapplication)		84.96	85.13	85.05
T_{12}:75%RDF+25%RDNthroughVermicompost+ NPKConsortium(Soilapplication)		81.64	82.90	82.27
S.Em.±	Y			1.00
	T	3.49	3.42	2.44
	Y×T			3.45
CDat 5%	Y			NS
	T	10.23	10.03	6.96
	Y×T			NS
CV%		7.25	7.05	7.15

5. Conclusion

Based on this data, 75% RDF (150:60:00 NPK kg/ha) + 25% RDN via Vermicompost + NPK Consortium soil treatment yielded the greatest maize growth, yield, and protein content. The second sesame crop grew and yielded more due to the residual influence of 75% RDF + 25% RDN via FYM + NPK Consortium (Soil application) and 50% RDF 50:25:00 NPK kg/ha. under a maize-sesame sequence under medium Gujarat conditions, applying 75% RDF + 25% RDN via FYM + NPK Consortium Soil increased system net realisation.

6. References

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