Progress Report

on

"Effect of Sagarika product and Nano N, Zn, Cu on Wheat Crop" (Rabi 2019-20)

Submitted By:

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IFFCO Sponsored Project: Sagarika

Experiment Title 1:- Effect of Sagarika (Liquid and Granules) on performance of Wheat (GW-366) crop

Experiment Details:

Location **:** Research farm, I.G.K.V. Raipur (C.G.)
Soil type **:** *Vertisol*
Season **:** *Rabi 2019-20*
Crop **:** Wheat (*Triticum aestivum*)
Variety: **:** GW-366
Plot size **:** 30 m^2
Treatments **:** 10
Replications **:** 03
Design **:** Randomized Block Design (RBD)
Date of Sowing : 12/12/2019
RDF : 120-60-40 (N-P-K)
Spray : 21 DAS- 06/01/2020
: 42 DAS- 27/01/2020
Date of Harvesting : 26/04/2020

Soil characteristics:

The experimental soil is locally called *Kanhar* and its come in *Vertisol* order. The soil was neutral in the reaction, low in organic carbon and available nitrogen, medium in available phosphorus and higher in available potassium. All the micronutriens were above the critical limits. The initial physio-chemical characteristics of the experimental soil are given in Table 1.1

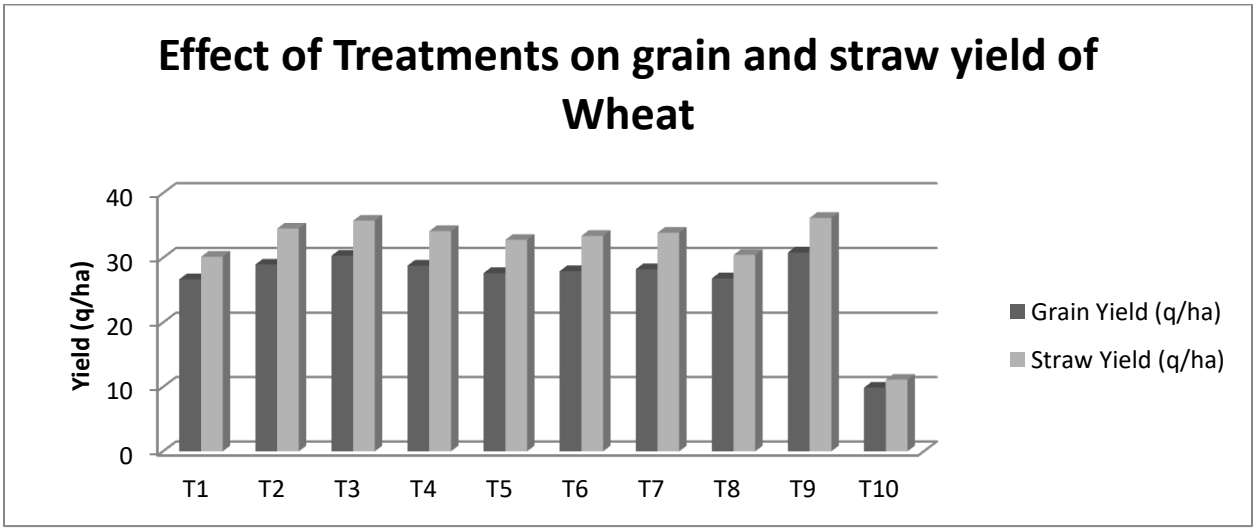
Table 1.1: Important chemical properties of soil:

Properties	**Value**
pH	7.4
EC(dS/m)	0.32
Organic carbon (%)	0.48
Available Nitrogen (kg ha^{-1})	187.80
Available potassium (kg ha^{-1})	485.70
Available phosphorous (kg ha^{-1})	15.46
Hot Water Extractable B (ppm)	3.3
DTPA extract Zn (ppm)	1.3
DTPA extract Mn (ppm)	11.9
DTPA extract Cu (ppm)	3.3
DTPA extract Fe (ppm)	9.5

Table 1.2: Effect of Sagarika (Liquid and Granules) on the grain and straw yield of Wheat

Treatment	Grain Yield (q/ha)	Straw Yield (q/ha)
T1- RDF (120:60:40)	26.68b	30.16b
T2- RDF + Seed Coating with NPK consortia @5ml/Kg	28.96ab	34.52ab
T3- RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS	30.33ab	35.74a
T4- RDF + Spray of Sagarika L. (0.25%) at 21 DAS + 42 DAS	28.80ab	34.13ab
T5- RDF + Seed Soaking with Sagarika L. (0.1%) + Spray of Sagarika L. (0.25%) at 21 DAS	27.65ab	32.78ab
T6- RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)	27.94ab	33.40ab
T7- RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS	28.23ab	33.88ab
T8- 75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS	26.82ab	30.45b
T9- RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS	30.84a	36.17a
T10- Control	9.89c	11.11c
S Em	1.220	1.423
CD	3.624	4.227

Fig. 1 **Effect of Treatments on grain and straw yield of Wheat**



RESULTS

Grain yield

The data presented in Table 1.2 & Fig.1 showed that the treatment T9 (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS) was significantly superior over T1 (RDF) and T10 (Control) but the at par with other treatments. Treatment 8 (75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha) + Spray of Sagarika L. (0.25%) at 42 DAS) also found at par with T1 (RDF), which saves upto 25% of NPK. The maximum grain yield (30.84 q ha^{-1}) was observed under the treatment T_9 (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS) followed by T3 (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS). The minimum grain yield (9.89 q ha^{-1}) was obtained under control (T10).

Straw yield

The data presented in Table 1.2 & Fig.1 showed that straw yield increased significantly with the T3 (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS) and T9 (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS) over RDF and Control. but at par with other treatments. Treatment 8 (75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS) also found at par with T1 (RDF). The maximum straw yield (36.17 q ha^{-1}) was observed under the treatment T_9 (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS) followed by T3 (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS) and the minimum straw yield (11.11 q ha^{-1}) was obtained under control (T10).

Economics

It is revealed from the data presented in table 1.3, that the cost of cultivation of wheat varied from Rs. 15450.0 to Rs.23490.0 per hectare for different treatments application. The data revealed that, the maximum marketable yield was observed under T9- RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS

(30.84 q ha^{-1}), and it also gave maximum gross return (56754.0). But the net return and B:C ratio was found higher in T3 (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS) followed by T9 (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAT). The Treatment T8 (75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS) treatment was at par with T1 (RDF) and showed similar B:C ratio (1.27). Thus saving of 25% of NPK by the application of Treatment 8 (75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS).

Table1.3 : Cost of Cultivation, Gross return, Net Return and B:C ratio of Wheat crop

Treatment	Yield (q/ha)	Cost of Cultivation (Rs/ha)	*Gross Return (Rs/ha)	Net Return (Rs/ha)	B:C ratio
T1- RDF (120:60:40)	26.68	21627	49087	27460	1.27
T2- RDF + Seed Coating with NPK consortia @5ml/Kg	28.96	21727	53280	31553	1.45
T3- RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS	30.33	22352	55809	33457	1.50
T4- RDF + Spray of Sagarika L. (0.25%) at 21 DAS + 42 DAS	28.80	22877	52992	30115	1.32
T5- RDF + Seed Soaking with Sagarika L. (0.1%) + Spray of Sagarika L. (0.25%) at 21 DAS	27.65	22352	50882	28530	1.28
T6- RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)	27.94	22665	51408	28743	1.27
T7- RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS	28.23	23290	51949	28660	1.23
T8- 75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) at 42 DAS	26.82	21746	49343	27597	1.27
T9- RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS	30.84	23490	56754	33264	1.42
T10- Control	9.89	15450	18196	2746	0.18

***Based on Grain Yield only**

Where Wheat MSP Rs. (2018-19)= Rs. 1840.0 , Urea= Rs. 266.0, MOP= Rs. 945.0, SSP= Rs. 450.0, Other operational Cost= Rs. 15450.0