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No./DRS/ADR-II/ PPP /2021/ 688 Raipur Dated: 6 / 07/2021

To,

State Marketing Manager
Indian Fertilizer Cooperative Limited
House No.-2, Sector 2, Geetanjali Nagar, Raipur

Sub:- Submission of progress report on effect of Sagarika product and Nano N, Zn, Cu on wheat crop for Rabi 2019-20 &2020-21

Find enclosed herewith one copy of progress report on effect of Sagarika product and Nano N, Zn, Cu on Rice crop for wheat crop for Rabi 2019-20 &2020-21. The report is being submitted for information and farther needful.

Encld:- One copy of project report

Director of Research

Endt.No./DRS/ADR-II /PPP/2021/689 Raipur dated: 6 /07/2021

Copy for information to-

1. Prof.& Head, Department of Soil Science, COA, Raipur.

Director of Research

Ole

Progress Report

on

Effect of Sagarika product and Nano N, Zn, Cu on wheat Crop

(Rabi seasons 2019-20 and 2020-21)

Submitted
By

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Project Conducted at

Sponsored by

Indian Farmers Fertilizers Cooperative Limited Raipur (CG)

Experiment Title

Effect of Sagarika (Liquid and Granules) on performance of wheat crop

Experiment Details:

Location : Research Farm, I.G.K.V. Raipur (C.G.)

Soil type : *Vertisol*

Season : *Rabi 2019-20 & 2020-21*

Crop : Wheat (*Triticumaestivum*)

Variety: : GW-366

Plot size : 30 m^2

No. of Treatments : 10

No. of Replications : 03

Design : Randomized Block Design (RBD)

Particulars	Rabi 2019-20	Rabi 2020-21
Date of Sowing	12/12/2019	02/12/2020
RDF	120-60-40 (N-P-K)	120-60-40 (N-P-K)
Spray schedule	21 DAS- 06/01/2020 42 DAS- 27/01/2020	21 DAS- 24/12/2020 42 DAS- 14/01/2021
Date of Harvesting	: 26/04/2020	06/04/2021

Results

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

Table 1.1: Important chemical properties of soil:

Properties	Value
PH	7.40
EC(dS/m)	0.30
Organic carbon (%)	0.45
Available Nitrogen (kg ha^{-1})	193
Available potassium (kg ha^{-1})	491
Available phosphorous (kg ha^{-1})	16.23
Hot Water Extractable B (ppm)	3.0
DTPA extract Zn (ppm)	1.5
DTPA extract Mn (ppm)	12.1
DTPA extract Cu (ppm)	3.5
DTPA extract Fe (ppm)	10.3

Grain yield: The data presented in Table 1.2 revealed 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) and was at par with that of treatment **T3** (RDF + Seed Coating with NPK consortia @5ml/kg + Spray of Sagarika L. (0.25%) at 21 DAS). 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) also found at par with **T1** (RDF), which saved up to 25% of NPK. The maximum grain yield (30.89 q ha^{-1}) was observed under 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) followed by **T3** (RDF + Seed coating with NPK consortia @ 5ml/kg + Spray of Sagarika L. (0.25%) at 21 DAS). The minimum grain yield (9.81 q ha^{-1}) was observed under control (**T10**).

Straw yield: The data presented in Table 1.2 indicate that all the combination of sagarika increased the dry matter yield except T5, T6, T8 as compared to RDF. These treatments (T5, T6, T8) were also at par with each other and among these treatments, the application of treatment T8 (75% RDF+ Soil application of Sagarika G. (25 kg/ha) at 21 DAS (25 kg/ha)+ Spray of Sagarika L. (0.25%) showed better dry matter partitioning efficiency with saving of 25% of N.

The maximum straw yield (36.49q ha^{-1}) was observed under 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) and T3 (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of

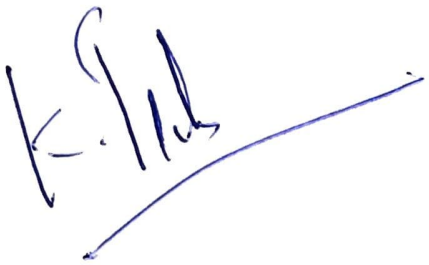
Sagarika L. (0.25%) at 21 DAS) and the minimum straw yield (11.01 q ha^{-1}) was obtained under control (T10).

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)		
	2019-20	2020-21	Pool	2019-20	2020-21	Pool
T1- RDF (120:60:40)	26.68b	27.13c	26.90d	30.16b	30.65a	30.41c
T2- RDF + Seed Coating with NPK consortia @5ml/Kg	28.96ab	29.06abc	29.01b	34.52ab	34.61a	34.56ab
T3- RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS	30.33ab	30.27a	30.30a	35.74a	36.50a	36.12a
T4- RDF + Spray of Sagarika L. (0.25%) at 21 DAS + 42 DAS	28.80ab	28.38abc	28.59bc	34.13ab	34.82a	34.47ab
T5- RDF + Seed Soaking with Sagarika L. (0.1%) + Spray of Sagarika L. (0.25%) at 21 DAS	27.65ab	27.88abc	27.77bcd	32.78ab	33.14a	32.96abc
T6- RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS (25 kg/ha)	27.94ab	27.58bc	27.76bcd	33.40ab	34.34a	33.87abc
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	28.71abc	28.47bc	33.88ab	35.61a	34.75ab
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	27.85bc	27.34cd	30.45b	31.10a	30.78bc
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	30.89ab	30.87a	36.17a	36.80a	36.49a
T10- Control	9.89c	9.73d	9.81e	11.11c	10.91b	11.01d
S Em+	1.220	1.021	0.492	1.423	2.093	1.341
CD (5 %)	3.624	3.033	1.462	4.227	6.219	3.984

Recommendation

1. The increase in wheat yield was 3.20 to 14.76 % by application of different combinations of treatment (NPK Consortia as Seed coating and Soil application with and without Sagarika and also sole application or combination of Sagrika as Seed soaking, foliar spray and soil application with and without NPK Consortia).
2. The maximum yield increase (14.76% and 12.64%) was observed with **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) and **T3** (RDF + Seed Coating with NPK consortia @5ml/kg + Spray of Sagarika L. (0.25%)) at 21 DAS, respectively.
3. Among the treatments, **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) was superior and yielded equal to RDF. Hence there is a saving of 25% of NPK by application of Sagarika granules and its spray .



Experiment of Nano N, Zn and Cu

Experiment of NPK Consortium and Sagarika (Liquid and Granules)