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No./DRS/ADR-II/ PPP /2021/ 3465 Raipur Dated: 22/02/2021

To,

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

Sub:- Submission of progress report on effect of Sagarika product and Nano N, Zn, Cu on Rice crop for Kharif 2020-21

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

**Encld:- One copy of project report**

22/2/21

**Director of Research**

Endt.No./DRS/ADR-II /PPP/2021/ Raipur dated: /02/2021

**Copy for information to-**

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

**Director of Research**

# Progress Report

## on

## "Effect of Sagarika product and Nano N, Zn, Cu on Rice Crop"
## (Kharif 2020-21)


**Submitted By:**

**Dr. L.K. Srivastava**

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**Dr. K. Tedia**

**Project Conducted at:**

**Department of Soil Science & Agricultural Chemistry**
**Indira Gandhi Krishi Vishwavidhyalaya, Raipur**

**Sponsored by: Indian Farmer's Fertilizer Cooperative Limited, Raipur**

IFFCO
पूर्णतः सहकारी स्वामित्व
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# Progress Report

**IFFCO Sponsored Project: Sagarika**

**Experiment Title 1:- Effect of Sagarika (Liquid and Granules) on performance of Rice (Rajeshwari) crop**

**Experiment Details:**

| | |
|---|---|
| **Location** | : Research farm, I.G.K.V. Raipur (C.G.) |
| **Soil type** | : *Vertisol* |
| **Season** | : *Kharif 2020-21* |
| **Crop** | : Rice (*Oryza sativa* L.) |
| **Variety:** | : Rajeshwari |
| **Plot size** | : 30 $m^2$ |
| **Treatments** | : 10 |
| **Replications** | : 03 |
| **Design** | : Randomized Block Design (RBD) |
| **Date of Transplanting** | : 21/07/2020 |
| **RDF** | : 120-60-40 (N-P-K) |
| **Spray** | : 14/08/2020<br>07/09/2020 |
| **Date of Harvesting** | : 10-11-2020 |

**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 micronutrients were above the critical limits. The initial physio-chemical characteristics of the experimental soil are given in Table 1.1

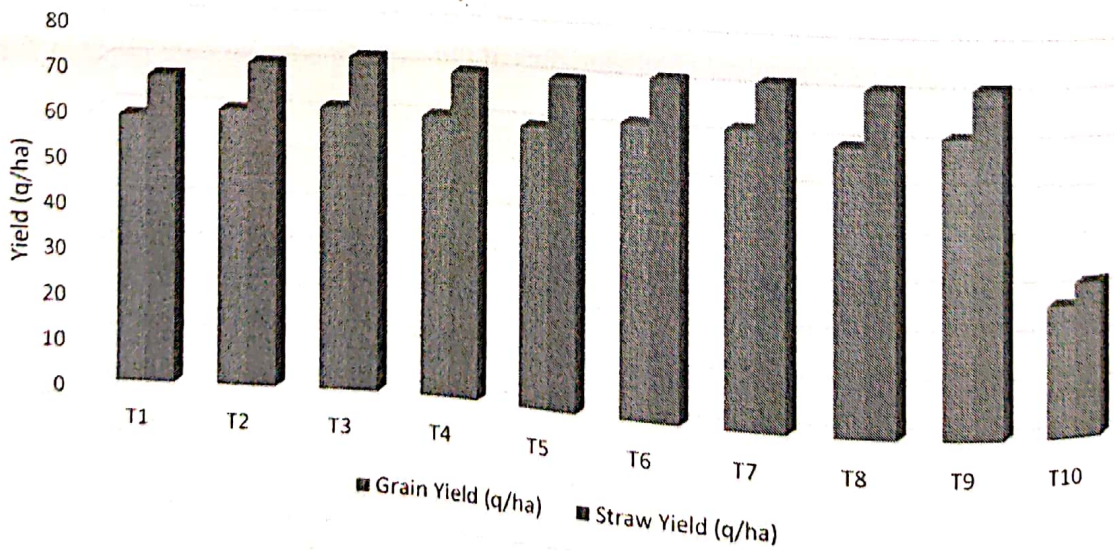
**Table 1.1: Important chemical properties of soil:**

| Properties | Value |
|---|---|
| pH | 7.4 |
| EC(dS/m) | 0.32 |
| Organic carbon (%) | 0.48 |
| Available Nitrogen (kg $ha^{-1}$) | 200.80 |
| Available potassium (kg $ha^{-1}$) | 385.70 |
| Available phosphorous (kg $ha^{-1}$) | 16.46 |
| DTPA extract Zn (ppm) | 1.61 |
| DTPA extract Mn (ppm) | 6.9 |
| DTPA extract Cu (ppm) | 2.6 |
| DTPA extract Fe (ppm) | 10.5 |

**Table 1.2: Effect of Sagarika (Liquid and Granules) on the grain yield of Rice**

| Treatment | Grain Yield (q/ha) | Straw Yield (q/ha) |
|---|---|---|
| **T1-** RDF (120:60:40) | 58.46b | 67.43a |
| **T2-** RDF + Seed Coating with NPK consortia @5ml/Kg | 60.43ab | 70.84a |
| **T3-** RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS | 61.66ab | 72.24a |
| **T4-** RDF + Spray of Sagarika L. (0.25%) at 21 DAS + 42 DAS | 60.51ab | 70.24a |
| **T5-** RDF + Seed Soaking with Sagarika L. (0.1%) + Spray of Sagarika L. (0.25%) at 21 DAS | 59.85ab | 70.46a |
| **T6-** RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS | 62.23ab | 72.07a |
| **T7-** RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS | 62.90a | 72.41a |
| **T8-** 75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS | 60.00ab | 71.77a |
| **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 | 62.94a | 72.56a |
| **T10-** Control | 27.67c | 32.25b |
| **S Em** | 1.46 | 1.86 |
| **CD** | 4.32 | 5.52 |

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



## RESULTS

### Grain yield

The data presented in Table 1.2 & Fig.1 showed that all the treatments applied were superior over control. Further, the various treatments combination **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), **T7** (RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS), **T6** (RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS), **T3** (RDF + Seed Coating with NPK consortia @5ml/Kg + Spray of Sagarika L. (0.25%) at 21 DAS), **T4** (RDF + Spray of Sagarika L. (0.25%) at 21 DAS + 42 DAS), **T2** (RDF + Seed Coating with NPK consortia @5ml/Kg), **T8** (75% RDF+ Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS) and **T5** (RDF + Seed Soaking with Sagarika L. (0.1%) + Spray of Sagarika L. (0.25%) at 21 DAS) showed similar yield to RDF.

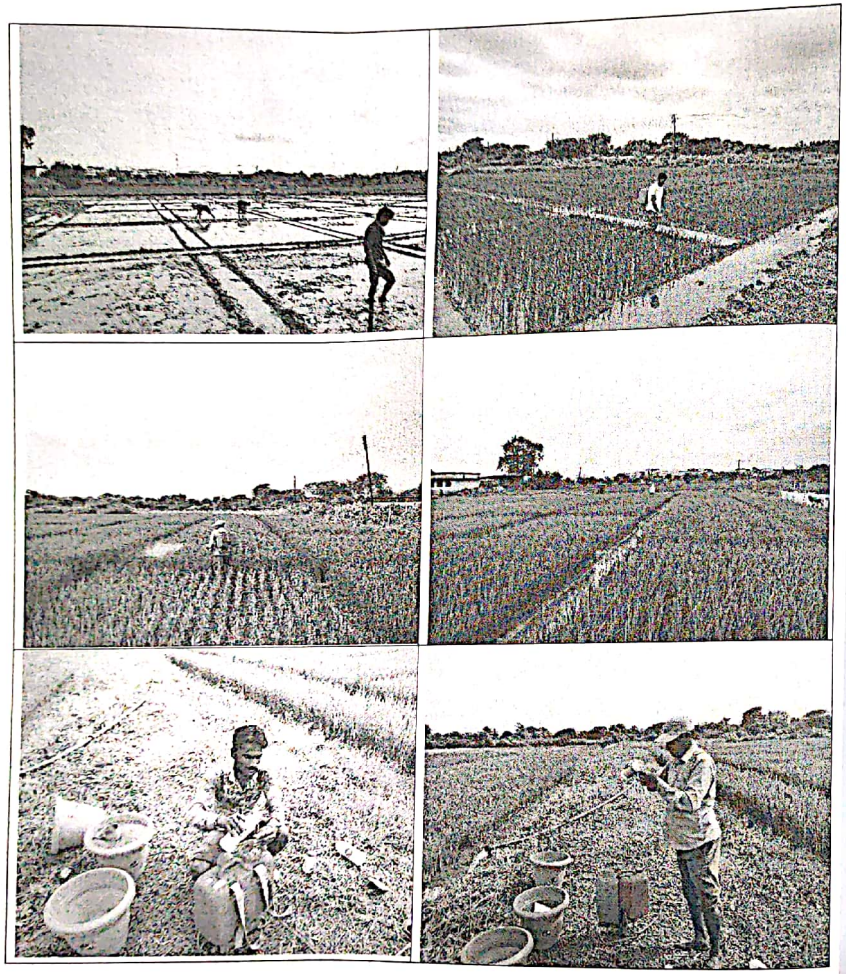
The treatment **T9** (RDF + Soil application of Sagarika G. (25 Kg/ha) with NPK consortia @3 L/ha at 21 DAS + Sagarika L. spray at 42 DAS) and **T7** (RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS) were similar to each other and showed significantly higher yield as compared to RDF. Similarly, **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 (62.94 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 **T7** (RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS). The minimum grain yield (27.67 q $ha^{-1}$) was obtained under control (**T10**).

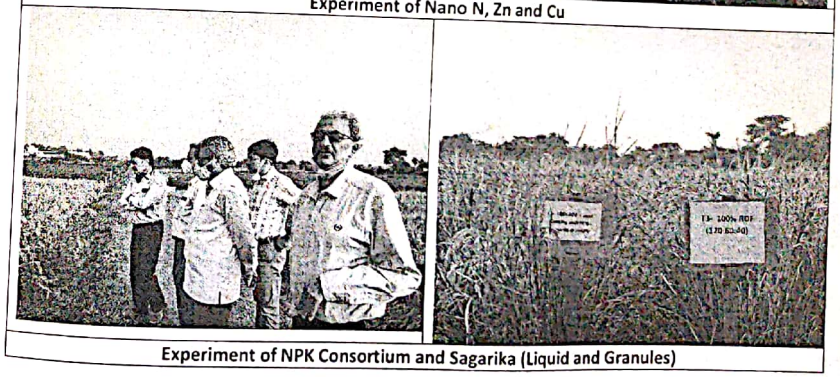
### Straw yield

The data presented in Table 1.2 & Fig.1 showed that straw yield increased significantly in all treatments applied over Control treatments. Further all the treatments combination of sagarika were found at par with each other and also with RDF. **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 (72.56 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 **T7** (RDF + Soil application of Sagarika G. (25 Kg/ha) at 21 DAS + Spray of Sagarika L. (0.25%) at 42 DAS) and the minimum straw yield (32.25 q $ha^{-1}$) was obtained under control (**T10**).



Experiment of Nano N, Zn and Cu



Experiment of NPK Consortium and Sagarika (Liquid and Granules)