

January 07, 2016

Project Harvest: Implementation of mrittikā

In collaboration with Rahimafrooz Renewable Energy Limited (RREL), GISBL tested and implemented mrittikā, a soil nutrient based fertilizer recommendation software, in Rangpur during Kharif season, 2015. The module mrittikā was used to generate fertilizer recommendation for selected farmers cultivating Aman rice. This report presents the comprehensive data reflecting the positive benefits achieved through the use of mrittikā.

Introduction:

After successful completion of a pilot with Grameen Intel, Rahimafrooz Renewable Energy Limited (RREL) has adopted mrittikā, the fertilizer recommendation software, in the solar power operated irrigation pump locations at Rangpur to offer fertilizer recommendation to the registered farmers.

This progress report focuses on the cultivation practice and results obtained for Aman rice at Mithapukur in Kharif 2015 season, using recommendation from mrittikā. The season end cost and harvest results of four smallholder farmers are presented in this report, which will focus on a few important parameters and the effect of GISB’s fertilizer recommendation solution ‘mrittikā’ on them. A comparison of the selected parameters namely yields, total fertilizer expenditure, yield to expenditure ratio have been done against the results obtained last year for Aman rice by the same farmers.

The details of the participating farmers are as below:

Farmer’s Name	Land size (decimal)	Month of sowing	Month of harvest
Md. Mizanur Rahman	15	June	December
Md. Solaiman Mondal	18	June	December
Md. Abul Kashem	25	May	November
Md. Mozaffar Hossain	10	May	November

Season timeline and fertilizer application pattern:

Farmers applied fertilizers in 3 phases after getting the recommendation from mrittika :

- **First dosage:** immediately after seedling establishment
- **Second dosage:** at early tillering stage
- **Third dosage:** 5-7 days before panicle initiation (PI) stage)



Focus parameters:

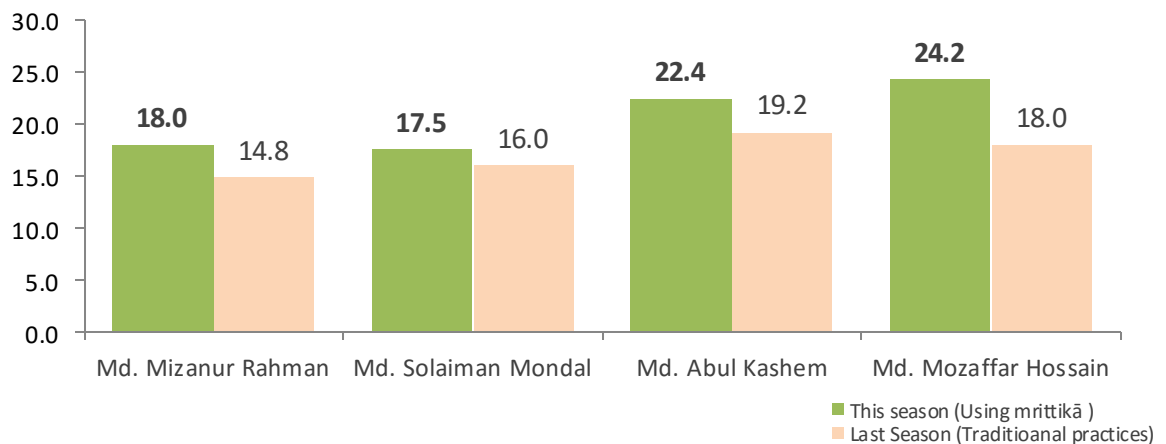
The following parameters were given primary attention to analyze the impact of mrittikā's recommendation on the cultivation and harvest of Aman rice:

- **Crop yield:** To capture the total yield received by the farmers, as well as the yield per decimal of land.
- **Fertilizer expense:** To record and analyze the cost of fertilizers required for this season and fertilizer expense for per decimal of land.
- **Ratio of total yield and total expenditure:** To explain the total return on fertilizer investment and the cost needed to produce 1 kg of Aman rice.

Harvest Data Analysis:

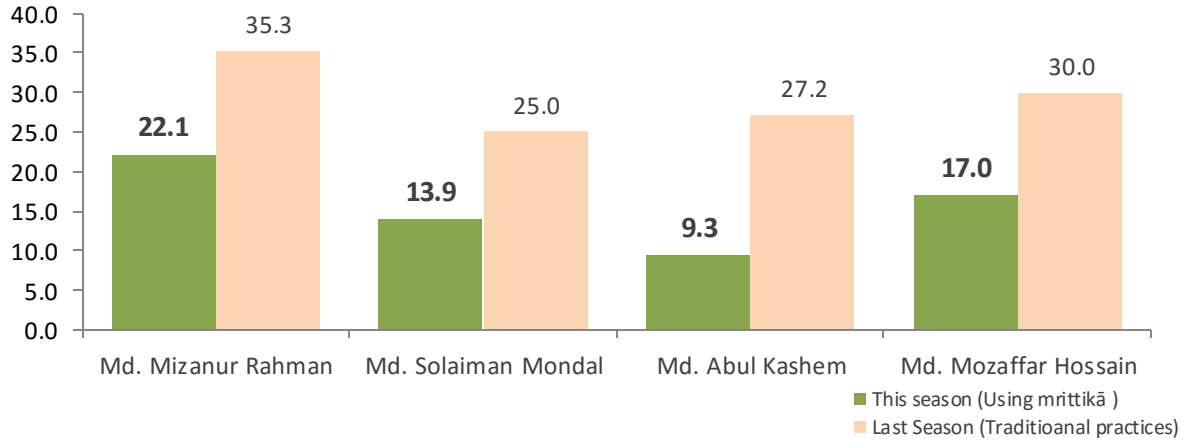
This section shows the graphical representation and analysis of the crop yield, fertilizer expense and the yield to expense ratio.

a. Crop yield per decimal



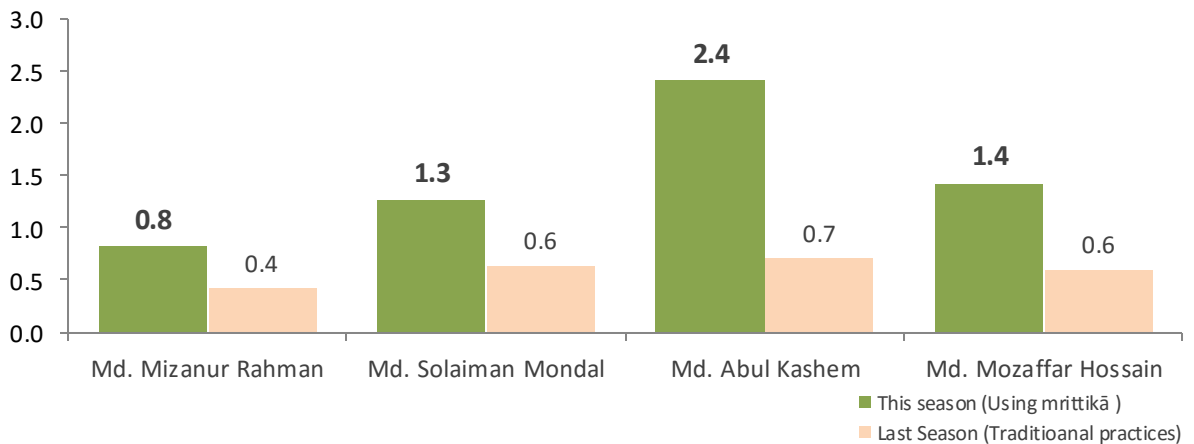
The graph points out the fact that the farmers had more crop yield per decimal this season using mrittika's recommendation than last season.

b. Fertilizer expense per decimal



The graph above explains that the farmers spent more on fertilizers in the last season. However, in this season after using mrittikā's recommendation the cost of fertilizers has gone down significantly.

c. Ratio of total yield and expenditure



After using mrittikā's recommendation, the farmers were able to get better total yield to total expenditure ratio, implying the fact that the farmer's using mrittikā's recommendation were able to harvest more of rice (in'Kg') for 'per taka' spent on fertilizers.

Highlight of the season:

The intervention with GISB's e-Agriculture solution where mrittika was used were able to generate the below impact for the smallholder farmers compared to last year when traditional farming practice was followed:

- **21% increase in yield per decimal**

The farmers were able to obtain 21% increase in yield per decimal using mrittikā's recommendation. The average yield per decimal obtained after using mrittikā's recommendation is 20.525 kg as opposed to 17 kg obtained during last year.

- **47% decrease in fertilizer expense per decimal**

The farmers experienced significant decrease by 47% in fertilizer expense per decimal after using mrittikā's recommendation. The average fertilizer expense per decimal using mrittikā's recommendation is 15.6 taka while the fertilizer expense per decimal was 29.4 taka in last year.

- **Higher yield to expenditure ratio**

The average ratio of yield and expenditure obtained this year using mrittikā's recommendation is 1.47 which is much higher compared to average ratio of total yield and total expenditure of 0.59 obtained last year. This implies that the farmers using mrittikā's recommendation this season were able to attain on an average 1.4 kg of aman rice for each taka spent on fertilizer; compared to last season where the farmers attained 0.59 kg of Aman rice for each taka spent on fertilizer.

APPENDIX

Harvest results: The table below gives an idea on the total yield and the expenditure associate with growing Aman rice this season.

Using mrittikā's recommendation (This season)

Name of the farmers	Land size (decimal)	Total yield (kg)	Total Yield per decimal (kg)	Total Expenditure (BDT)	Total Expenditure per decimal (BDT)	Ratio of total yield and total expenditure
Md. Mizanur Rahman	15	270	18	332	22.1	0.81
Md. Solaiman Mondal	18	315	17.5	250	13.9	1.3
Md. AbulKashem	25	560	22.4	233	9.3	2.4
Md. Mozaffar Hossain	10	242	24.2	170	17	1.4

Not using mrittikā's recommendation (Last season)

Name of the farmers	Land size (decimal)	Total yield (kg)	Total Yield per decimal (kg)	Total Expenditure (BDT)	Total Expenditure per decimal (BDT)	Ratio of total yield and total expenditure
Md. Mizanur Rahman	15	222	14.8	530	35.3	0.42
Md. Solaiman Mondal	18	288	16	450	25	0.64
Md. AbulKashem	25	480	19.2	680	27.2	0.71
Md. Mozaffar Hossain	10	180	18	300	30	0.6