Establishment of Large-scale Paddy plot Demonstration by SLIAg Jointly with the DOA in Polonnaruwa district

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1. Introduction.

Large-scale demonstration was established during Maha 2023/24 in the Polonnaruwa district as a case study to educate rice farmers on the benefit of using the recommended package of practices by the Department of Agriculture on paddy farming. This was necessitated as almost all paddy farmers were compelled not to use the recommended amount of chemical fertilizer and other recommended practices due to policy decisions taken overnight by the Government to shift to organic agriculture throughout the country. This has resulted in a decrease of the rice productivity and the total production and negatively affected food insecurity in Sri Lanka. During the years of 2021 and 2022 chemical fertilizer was neither available nor affordable for paddy farmers due to import restriction and extremely higher prices. Sri Lanka Institute of Agriculture initiated this demonstration program with the persuasion and the financial support from the Honorary fellow Mr. Suranimala Wirasinghe.

2. Objective of the case study.

During the period of 2022-2023, there was a misconception among the farming population that rice yield cannot be increased due to unknown factors in the field such as nematodes, other diseases etc. Therefore, the objective of the study was to show and to prove to the farmers that rice yield can be increased and rice farming can be made profitable if the recommended package of practices, particularly soil fertility improvement practices together with other cultural practices are correctly used for the cultivation.

3. The process followed for the study

3.1 Location and Farmer selection: SLIAg with the concurrence of the DGA of Department of Agriculture, selected Polonnaruwa district to conduct this demonstration as Polonnaruwa is one of the leading rice producing districts in the Country. SLIAg coordinated this program with Deputy director (Interprovincial extension) Polonnaruwa implemented the program in the district with his extension staff[1]. Rice Research & Development Institutes provided the technical package of practices to obtain the highest possible yield.

The experienced farmer[1] was selected to conduct this one-acre demonstration in his field at 59/2, Palugasdamana, Polannuruwa and Bg 409 a 4-month rice variety was used by the farmer. This rice field is under the *"Parackrama Samudraya"* irrigation scheme with assured irrigation water supply for both cultivation seasons.

3.2 Field operations: Field activities commenced in 1st week of November 2023 with the presence of Agriculture Instructor(AI)[1] of the area Agriculture Instructor, Singha Pura, Sewagama. The activity plan with the time frame for the establishment of demonstration are given in Table 1.

[1] Names of the collaborators are listed at the end of the document

Table 1. Activity plan with the time frame for the establishment of demonstration

No.	Date / Time Duration	Activities
01	2023 Oct 13	Soil sample collection
02	2023 Oct 13 & 14	Bund cleaning
03	2023 Oct 15	Primary tillage (use disc plough or mould board plough)
04	2023 Oct 24 & 25	Secondary tillage (adding cow dung and green manure)
05	2023 0ct 27 & 28	Bund preparation
06	2023 Nov 04	Third tillage (raking) Apply the burned paddy husk
07	2023 Nov 29	Seed paddy broadcasting Apply chemical fertilizer (Basal dressing) Apply weedicide (Sofit)
08	2023 Dec 12	Apply chemical fertilizer (First application)
09	2023 Dec 26	Apply chemical fertilizer (Second application)
10	2024 Jan 10	Apply chemical fertilizer (Third application)
11	2024 Jan 20	Flowering and maturing
12	2024 Jan 27	Apply 8-10 kg urea fertilizer
13	2024 Mar 15	Harvesting and filed day

One acre was demarcated by measuring a 4000 sq meter plot in the farmer's field to conduct this demonstration. The following organic matter was used as agreed responsibility of the farmer after the second ploughing. The expenditures incurred on fertilizer, agrochemical, half the cost of organic Matter, Charcoal preparation Kunthani, were paid by the SLIAg funding as given in Table 2.

Table 2. Expenditure looked after by SLIAg

No.	Items	Amount	Price per Unit Rs.	Contribution	Total Rs
01	Urea	125 kg	200.00	100 %	25000.00
02	TSP	45 kg	260.00	100 %	11700.00
03	MOP	35 kg	240.00	100 %	8400.00
04	$ZnSO_4$	02 kg	400.00	100 %	800.00
05	Kieserite	02 kg	500.00	100 %	1000.00
06	Kunthani	01 unit	10000.00	100 %	10000.00
07	Cow dung	02 Tons	15000.00	50 %	15000.00
08	Paddy husk	750 kg	05.00	50 %	3750.00
				Total	**75650.00**

3.3 Recommended package: The package of practices adopted, that could yield of 200 bushels or higher per acre in the demonstration site is as follow.1. Timely cultivation with suitable variety,

2. Proper land preparation, with 20-25 cm depth ploughing
3. Soil fertility management with Organic Matter and correct amount of chemical fertilizer ,
4. Pest & Diseases Management with IPM practices,
5. Pre and post-harvest management practices

The organic matter applied were as follow

- Paddy husk charcoal – 270 kgs (DOA officers demonstrated the method of preparing and applying the Paddy husk charcoal in the presence of other neighboring farmers)
- Cow dung – 750 kgs
- Green manure – 150 kgs

The amounts of basal fertilizer applied at the time of seed broadcasting are given in Table 3. The fertilizer application was always done in the presence of Agriculture Instructor (AI). These fertilizers were supplied directly from the CFC fertilizer stores which was coordinated by the district agriculture Director of the district secretariat.

Table 3. Amount of fertilizer applied for one acre plot. .

	Urea kg	TSP kg	MOP kg	$ZnSO_4$ kgs	Kieserite kgs
Basal Application (at the time sowing)	05	45	05	02	05
1st Top dressing at 2 wks after sowing	35				
2nd top dressing at five weeks after sowing	50		10		
3rd Top dressing after seven weeks of sowing	30		20		
Total amount	120	45	35	02	05

3.4 Crop Management: To control the weeds, weedicide named as "Sofit" as a pre-emergence herbicide was used at soon after sowing of seed paddy

It was observed about 5 % damage of leaf roller pest during the growing period. But pesticide was not used to control this pest. The biological control of pest-naturally emerged predators- were used to manage the damage to the crop.

4. Field days for Demonstration

A number of field days were conducted to educate the neighboring farmers on the package of practices. A harvesting field day was held on 15th Mar 2024 by the extension staff with the participation of neighboring farmers, officers of the divisional secretariat, Polonaruwa and district secretariat, Deputy director Extension) Polonnaruwa and the extension staff and a few General Council members of the SLIAGs.

Crop cut yield estimation was done in accordance with procedures of the Dept of Census statics in the presence of the all SLIAg officers and the other officials .

5. The Results of the crop cut survey

Area of the Crop cut Survey done	=	1 perch (25 sq Meter)
Number of Sears obtained after threshing and winnowing	=	36.5 Sears
Number of Perches per acre	=	160
Number of Sears per bushel	=	32
Yield (no of Bu per acre) (36.5x160)/32	=	182.5
Net extent after reduction bunds areas 182.5X95%	=	173.37
Estimated yield	=	173. Bushels per acres
Metric Tons per hectare (173.4 x 20.5 x2.5) 1000	=	8.8 mt/ha

Accordingly, the yield obtained from the demonstration plot was 173 bushels per acre or 8.8 MT/ha. This was confirmed by the farmer as he obtained the total yield from one acre was 170 bushels or 3,485 kgs.

6. Cost of Production calculation

The cost of the cultivation as calculated for the expenditure incurred in the operation of the demonstration plot is shown in Table 4.

Table 4. Expenditure on procurement of the fertilizer and others inputs

S/N	Task	Price (Rs.)
01.	Bund clearing and bounding	10000.00
02.	Ploughing (3 times)	20000.00
03.	Seed paddy	8000.00
04.	Seed paddy broadcasting	5000.00
05.	Fertilizer cost per acre	47700.00
06.	Fertilizer application	2500.00
07.	weedicide	6300.00
08.	For weedicide application	2500.00
09.	For organic fertilizer (burned paddy husk, cow dung, leaf manure)	10000.00
10.	For insecticide	0.00
11.	Water management	9000.00
12.	For harvesting	18000.00
13.	For paddy drying	5000.00
14.	Others (foods, transport, polybags)	30000.00
	Total	**174000.00**

Cost of production per acres as appeared in the Table 4 is Rs 174,000 per acre. The Number of kg per acre was (170x 20.5) kg 3485. Therefore, the cost of production per kg of paddy was (174,000/3485) Rs. 49.90 which is approximately Rs. 50.00 . Prevailing paddy price during the period was Rs 100.00 per kg. Therefore, the farmer obtained the profit of (3485x 100- 174000) Rs. 174,500 from one acre. Since the farmer was cultivating 5 acres the profit is Rs 872,500 . The farmer's profit per one month is (872,500/6) Rs 145,416.00 which is more than adequate to maintain his family.

7. Conclusion

This study concludes that if a recommended package of technologies is practiced, higher yields can be obtained. And if at least two hectares are cultivated, rice cultivation can be made profitable for an average farmer family that can entirely depend on the income received from rice cultivation for their living.

Crop establishment on2023/11/29



Mixing of staright Fertilizers



Rice Husk Charcoal preparation



Field situation on 2024/02/02



Harvesting Day and the Field Day

The field day was organized on 15 March 2024 by the Deputy Director Office of Agriculture (Inter Province) Polonnaruwa.

Field day on 15th March 2024









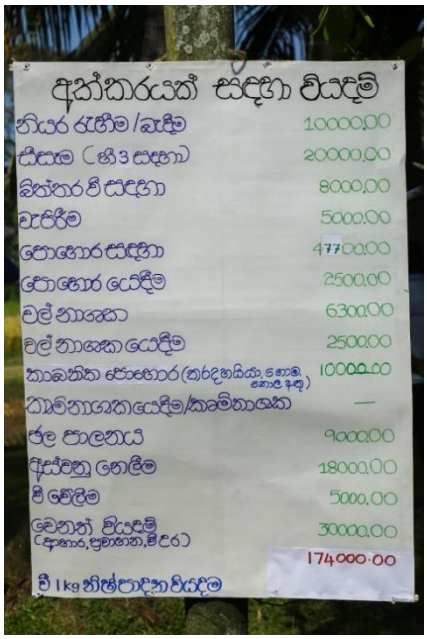
Crop cut survey done on 15th Mar 2024













Farmer Mr. M A Wijeratne

Collaborators of the study

1. Mr. M A Wijeratne ,The Farmer , 59/2, Palugasdamana, Polannuruwa- conducted the demonstration in his rice field .
2. Mr. Amal Arunppriya president of the SLIAg participated all major activities and supporting for implementation.
3. Mr. K E Karunathilake former Presedent, SLAIg. participated all major activities and supporting for implementation.
4. Mr. Shantha Emitiyagoda Coordinator of the SLIAG. Coordinated the program from the SLIAg
5. Mr. P W Rohana C Paragahagoda Deputy Director (Interprovincial Extension) Polonaruwa- Overall execution and coordination of conducting demonstration, with DOA, Polonaruwa District. Secretariat, SLIAG, Guiding field staff, Supply of Inputs in time, and financial disbursement
6. Mr. R P Upali District Agriculture Director , District secretariat, Polonnaruwa who supported in selecting farmers and coordinated to supply fertilizer.
7. Mr. Kamal Premaratne Subject Matter officer, DD (Ext) Office, Polonaruwa- Selection of Location and farmer, Field operation, technical guiding & support services, supporting to filed Agriculture Instructor, Supporting for conduct of field day.
8. Mr, Milinda Patabedige, Agriculture Instructor, Singha Pura, Sewagama- Actual field operation of establishment of demonstration, with Farmer Mr Wijeratne.
9. Mrs. Rasika Rajapakse Agriculture Instructor, Officer in Charge, Sewagama- Supporting for conducting of harvesting field day on 15th March 2024

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