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COMPETITIVENESS AS A SELF MOTIVATION TO INCREASE PRODUCTIVITY IN RICE: A NEW EXTENSION APPROACH TO *YAYA* PROGRAM

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ABSTRACT

***Yaya* Demonstration Program (YDP) was started in 1998 *yala* by Department of Agriculture (DOA) to increase the production in rice farming. There were 374 YDP groups by 2001 *yala* in Ampara district covering 10115 ha (26.7% of total extent) involving 7513 farmers. The average yield of YDP ranges from 4.5 to 6.6 t/ha while the average yield of the district ranges from 4.0 to 5.5 t/ha from 1998 *yala* to 2001 *yala*. Fertilizer credit facility and farmer training classes with new technology, paved way to success of YDP. Temporary suspension of credit facility during 2000/01 *maha* and 2001 *yala* discouraged farmers in YDP. A farmers' competition has been introduced after 2001 *yala* as a new extension approach to YDP. The study was focused on to assess the effectiveness of a new extension approach for farmers in *YDP* that can increase the productivity in the rice farming through motivating farmers and extension officers. Selected twenty-five farmers in YDP from Uhana Divisional Secretariat Area were given DOA fertilizer recommendation free of charge in 2001 *yala*. Number was increased up to 215 volunteer farmers in 2001/02 *maha*. 25 and 40 out of 215 were supplied with free fertilizer for 0.4 ha and 0.2 ha respectively. It was announced that three farmers who obtained highest yields and extension officers responsible for advising those farmers would receive prizes and certificates. The average yield in 2001 *yala* was 8.2 t/ha while maximum yield obtained was 9.6 t/ha. The average yield in 2001/02 *maha* was 6.8 t/ha while maximum yield was 10 t/ha. The highest yield obtained before from *YDP* in Ampara was 8.6 t/ha in 1998 *yala* and 7.9 t/ha in 1998/99 *maha*. The 0.4 ha demonstration program by giving inorganic fertilizer free of charge was more successful. The farmer who obtained the highest yield within the *YDP* group could be used to guide others in the *YDP* to increase the productivity. The competition could be a fruitful addition to the ongoing *YDP*.**

KEYWORDS: Extension Approach, *Yaya* Demonstration.

INTRODUCTION

In 1999, rice sector contributed 3.5% to the Sri Lankan Gross National Product (GNP) (Annual Report, 1999). Total rice production of the country is fluctuating from 2.06 to 2.8 million t during 1990 decade. Area sawn of paddy ranges from 730,000 ha to 930,000 ha during the decade. However, fertilizer usage has remarkably increased from 143,000 t to 314,500 t from 1990 to 1999 (Annual Report, 1999). Average yield of paddy is 3.8 t/ha and 3.95 t/ha in 1999/00 *maha* and 2000 *yala* respectively (Dept. of Census and Statistics). However, the potential yield of the rice is more than 10 t/ha (Dissanayake *et al.*, 2000). Crop management deficiencies together with other non-technical factors such as less input supply, non availability of credit facility and the inadequate marketing facilities for farmers are the major factors responsible for this yield gap (Emitiyagoda *et al.*, 2000).

Yaya Demonstration Program (*YDP*) (=Rice production *yaya* approach) is a farmer participatory approach introduced to bridge the yield gap while focusing at long term sustainability of the rice production system. *Yaya*

is the whole tract with an area about 30-40 ha, where a small group of farmers work simultaneously.

YDP was formally launched during 1998 *yala* season in 397 *yaya* with the participation of 10,490 farmers in the dry and intermediate zone of Sri Lanka by Department of Agriculture (DOA) to increase the productivity in rice farmers. The number gradually increased to 45800 farmers in 1383 *yaya* in 1999 *maha* (Emitiyagoda *et al.*, 2000). There were 374 *YDP* groups in Ampara district in 2001 *yala* covering 10115 hectare (26.7% of total extent) involving 7,513 farmers. The district average yield of *YDP* in Ampara ranges from 4.5 to 6.6 t/ha while average yield of the district including *YDP* was between 4.1 t/ha to 5.5 Mt/ha from 1998 *yala* to 2001 *yala* (Table 1).

Table 1. Highest and average yield (t/ha) of *YDP* and non-*YDP* in Ampara district

	Seasons			
	1998 yala	*1998/99 maha*	*1999 yala*	*1999/00 maha*
Highest yield	8.6	7.9	8.5	5.4
Average yield	6.6	6.1	6.4	4.5
Non-YDP Average yield	5.0	4.3	4.7	4.0

Source: Extension and training center, DOA

The results discouraged DOA officers since the average yield of *YDP* dropped from 6.6 t/ha to 5.3 t/ha from 1998 *yala* to 2001 *yala* and 6.4 t/ha to 5.2 t/ha from 1998/99 *maha* to 1999/2000 *maha* in Uhana Divisional Secretary Area (UDSA). The maximum yield obtained in UDSA is 8.6 t/ha in 1998 *yala* (Table 2).

Table 2. Average yield of *YDP* in UDSA

	Seasons						
	1998 yala	*1998/99 maha*	*1999 yala*	*1999/00 maha*	*2000 yala*	*2000/01 maha*	*2001 yala*
Average yield (t/ha)	6.6	6.4	No data	5.2	5.6	No data	5.3

Source: Unpublished data from Dept. of Census and Statistics

Fertilizer credit facilities and farmer training classes with navel technology paved way to success of *YDP* (Emitiyagoda *et al.*, 2000). Temporary suspension of credit facility by Ceylon (Sri Lanka) Fertilizer Corporation & DOA after 2000/01 *maha* season discouraged most of the farmers in *YDP* resulting in yield drop. Therefore a new extension approach was needed to solve the problem. Thus a farmers' competition was introduced since 2001 *yala* as a new extension approach to *YDP*.

The study focused to assess the effectiveness of a new extension approach for farmers in *YDP* that can increase the productivity in the rice farming through motivating farmers and extension officers, to get 10 t/ha yield by integrated crop management practices and to increase the total rice production in the district.

MATERIALS AND METHODS

The competition started with the selection of 25 farmers from UDSA in 2001 *yala*. They were given DOA fertilizer recommendation free of charge in 2001 *yala* (Annexure 1). Number was gradually increased up to 215 farmers in 2001/2002 *maha*.

Twenty five and 40 out of 215 farmers were supplied with free inorganic fertilizer for 0.4 ha (one acre) and 0.2 ha (0.5 acre) respectively. All competitors were asked to follow DOA integrated crop management recommendations (Annexure 2) in 2001 *yala* and 2001/02 *maha*. Minimum area that should be cultivated to qualify for the competition was 0.2 ha. It was announced that three farmers who obtain highest yields and extension officers responsible for advisory those farmers would receive prizes and certificates.

Three farmer and officer training sessions were conducted during both seasons. Training was focused on compost production by cement tank method and the heap method, cow dung collection, other soil fertility improvement programs such as adding rice straw, green manure and 0.62 t/ha (250 kg/ac) of charred rice husk. Special clinics for pest and disease control were carried. Range Agriculture Instructors (AI) and Agriculture Research and Development Officers (ARDO) were guided at biweekly training on dealing with technical matters and extension approaches. Frequent farmer visits and close monitoring were done. At the end of each season, 1 to 3 field days were held in each AI/ARDO divisions to disseminate the message to other *yaya* and non-*yaya* farmers. Random crop cutting survey was done by a group of unbiased officers from DOA and Department of Agrarian Development (DAD). The *YDP* group farmers witnessed it.

RESULTS AND DISCUSSION

In the competition, the average yield in 2001 *yala* was 8.2 t/ha while maximum yield obtained was 9.6 t/ha. The average yield in 2001/2002 *maha* was 6.8 t/ha while maximum yield was 10.0 t/ha. The results of the two seasons were encouraging extension officers because the highest yield obtained so far from *YDP* in Ampara is 8.6 t/ha in 1998 *yala* and 7.9 t/ha in 1998/99 *maha* (Dept. of Census and Statistics).

About 13% of the 0.4 ha (one-acre) demonstration farmers obtained yield of more than 8.8 t/ha in 2001 *yala* and the proportion increased up to 30% in 2001/2002 *maha* for the same group (Table 3). Results clearly showed that average yield of 0.4 ha demonstrations' farmers were highest during both seasons. Average yield of 0.4 ha demonstration is 8.2 t/ha in 2001 *yala* compare to 7.6 t/ha in 2001/02 *maha*. It was assumed that the climatic factors and fungal diseases lead to lower yield in *maha*.

Table 3. Yield distribution (t/ha)* in 2001 *yala* and 2001/02 *maha* in Uhana

			% of farmers in different yield intervals			
	No of farmers	*Average yield (t/ha)*	*4.2-5.7 (81-110)*	*5.7<-7.2 (111-140)*	*7.2<-8.8 (141-170)*	*8.8<-10.3 (171-200)*
2001 yala .0.4 ha free demonstration	25	8.2	0%	26%	61%	13%
2001/ 2002 maha 0.4 ha free demonstration	25	7.6	9%	26%	35%	30%
0.2 ha free demonstration	40	6.6	25%	50%	25%	0%
Overall free demonstration (b+c)	65	7.1	16%	38%	30%	16%
Volunteer farmers	150	6.7	17%	41%	23%	9%
Total of the program(b+c+e)	215	6.8	24%	40%	26%	10%

* = bushel per acre value shown in parenthesis

It was expected that the yield of 0.2 hectare-free fertilizer demonstration trials would be higher compare to 0.4 ha since the management is easier for 0.2 ha. But the average yield of 0.2 hectare-free fertilizer demonstrations has dropped to 6.6 t/ha though the recommendations applied to overall free demonstrations are same. The reason was not reveal in the study. However those 0.2 ha trials were directly monitored by Agriculture Research and Production Assistants (ARPA) of DAD while 0.4 ha trials monitored by AI or ARDO.

More importantly 9% of the competitors who used fertilizer at own cost, received more than 8.8 t/ha though the figure is nil from 0.2 ha free fertilizer demonstrations. Volunteers have obtained 6.7 t/ha of average yield. Highest yield of 10.0 t/ha in 2001/02 *maha* was from a volunteer farmer who has adopted the similar package that the free fertilizer demonstrators adopted. Maximum yields obtained by 0.4 ha and 0.2 ha free fertilizer demonstrators are 9.6 t/ha and 8.8 t/ha in the same season respectively.

The program average was always higher than *YDP* averages (Table 4). The reason can be that the competitiveness of the program has motivated farmers to apply higher levels of inputs that yield highly productive outputs.

Table 4. Comparison of average yield (t/ha) in the *YDP* with the competition in UDSA

Yala		*Maha*	
Year	*Avg. yield*	*Year*	*Avg. yield*
1998	6.6	1998/99	6.4
1999	na.	1999/00	5.2
2000	5.6	2000/01	na.
2001	5.3	2001/02	na.
2001 competition	8.2	2001/02 competition	6.8

Source: Dept. of Census and Statistics, na- not available

Highly increased demand for organic manure especially for cow dung, early preparation for seasonal activities, and farmers' comparison of their fields with others' fields thus increasing alertness to various activities and pest and diseases emergences were visible. Those outcomes would be possibly proved in the future studies.

Farmer group was very positively responded to officers' instructions and more than 95% participated in the training classes. Their more concern about cost of production was experienced by extension officers. More importantly field officers' attitudes have been changed. They were very vigilant and keen on their farmers' activities. The results shows that the 0.4 hectare demonstration program by giving inorganic fertilizer free of charge is more successful since its average and highest yields are better than 0.2 ha demonstrations and volunteer farmers. But without free fertilizer also can guide farmers to enhance productivity of rice farming by the competition.

The highest yielded farmer within the *YDP* group could be used to guide others in the *YDP* to increase the productivity. If this procedure could be introduced to on gong *YDP* it can be more successful in the long run. The program is going on in the 2002 *yala* with three additional services to the present program. Those are the forward contract system for rice marketing, introduction of sun hemp as a green manure and compost production to rice farming.

The main problem encountered in this study was difficulty in conducting large number of unbiased crop cut surveys at the end of season. But it will possibly solve with more planning.

CONCLUSIONS

The competition could be a fruitful addition to the ongoing *YDP*. The competition helps to motivate farmers to enhance productivity in rice farming. Thus it is very useful to conduct 0.4 ha (one-acre) fertilizer demonstration program, as a competition that is open to all volunteer farmers would give best results than the non-competitive conditions.

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ANNEXES

Annexure 1

DOA fertilizer recommendation in 2000

	Urea kg/ac	*TSP kg/ac*	*MOP kg/ac*	*$ZnSO_4$ kg/ac*
Basal	05	45	30	02
1st Top Dressing (after 3 wk)	25			
2nd Top Dressing (after 5-6 wk)	55		15	
3rd Top Dressing (after 8-10 wk)	40			
Total	125	45	45	02

Source: Ariyaratne *et al.*, 2002

Annexure 2

PACKAGE OF PRACTICES FOR MAXIMIZING YIELD

Improvement of Soil fertility (Priority No 1)
1. Use of Straight Fertilizer as annexure, 2. Discourage Ready Made Fertilizer mixtures, 3. Use of Organic Matter (Rice straw 5t/ ha, Cow dung 5t/ ha & Green manure 5t/ ha)

Crop Management (Priority No 2)
Weed Control, Chemical, Mechanical & Manual Methods, Insect Control, Use of Resistant Varieties, IPM, Surveillance & Forecasting, Chemical Control, Disease Control, Use of Resistant Varieties, Cultural Methods, Chemical Control

Proper Land Preparation (Wet/Dry) (Priority No 2)
First Ploughing 20-25 cm deeper, Decomposition of organic matter, Ploughing, Harrowing and leveling

Timely Cultivation (Priority No 3)
Recommended time of planting, Collectively by farmer group

Selection of the Appropriate Variety (Priority No 3)
Age class depends on time of planting & the location, Optimum plant density, Broadcasting of pre-germinated seeds
Seed rate depends on seed size (100-150 kg/ha), Transplanting, Spacing based on the age class (10*10 CM), Use of good quality seed paddy, The government, The private companies, Self-seed produced by farmers

Source: Emitiyagoda *et al., 2000*