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Short Communication

Effect of Demonstration on Use of Paddy Straw Baler in Raichur District

Mouneshwari R Kammar, Vidyavathi G Yand Amaresh Y S

Krishi Vigyan Kendra, Raichur (Karnataka)

INTRODUCTION

About 620 MT of rice straw produced in 2008 in Asia and now approximately 731MT per year rice straw is produced globally (Africa: 20.9 million tons, Asia: 667.6 million tons, Europe: 3.9 million tons, America: 37.2 million tons, and Oceania: 1.7 million tons). After China, India is the larger producer of paddy. India produces 98 MT of paddy with roughly 130 MT of straw. Of this, about half is used as animal fodder. The rest is mostly burnt in the fields, though a small amount is also used by brick kilns and paper and packaging industry. However, because of continuous failure of rainfall, the farmers are unable to go for rice-rice cultivation practice, and thus there is heavy demand for the paddy straw as fodder for the animals. In such conditions, transporting the straw in condensed form with lesser cost becomes a challenge. Farmers find that, the transportation of rice straw is very difficult because of bulkiness and cost of transportation.

Paddy is a major crop is Raichur district, cultivated over one lakh ha area including *kharif* and *rabi* seasons. According to the statistics available with the department of Agriculture (2014-15) per ha production of rice is about 6500 kg/ha and average straw production is about 4 t/ ha. Collection and management of rice straw is a major challenge for the environmental and economic reasons. Collecting this huge amount of straw manually is a major challenge for the farmers because of the labour shortage and also due to bulkiness. This straw stored as well as stored fodder. Because of the mechanization in rice, when the rice is harvested by combine harvester, it leaves a significant length of straw in the field. For the preparation of the land for the next season and in a hurry to prepare the land for the next crop farmers find it easy to burn the straw. Increasing labour cost is another reason farmers prefer setting fire to their paddy fields after harvesting the crop. As an answer to these challenges, KVK, Raichur introduced, paddy straw baler in the farmers fields under front line demonstration (FLD) on mechanization of paddy from 2014-15 to 2016-17 with the objectives to study the extent of adoption of paddy baler, to assess the drudgery of women in manual collection of paddy straw and to study the utilization pattern of straw after baling.

MATERIALS AND METHODS

Radha Krishna Camp of Harvi village, Gudadinni camp of Manvi taluka and Kasabe camp, Vijayanagar camp of KVK Raichur were selected consecutively during 2014-15 and 2015-16 and 2016-17 for the study. This area was purposively selected because these camps were inhabited by Andra migrants with major area under paddy. During 2014-15, front line demonstration were conducted at 5 farmers' fields in Radha Krishna Camp on mechanization in paddy, during 2015-16, demonstrations on paddy baling using the baler available with the department of Agriculture were conducted at the Gudadinni camp of Manvi Taluka for a group of 100 farmers and during 2016-17, FLDs were carried out in Vijayanagar Camp to popularize the baling of paddy straw. The

Corresponding Author's Email: mrkammar13@gmail.com

Table 1. Impact of demonstration on Horizontal spread of paddy straw baler in Raichur.

Particular	Before demonstration	After demonstration
No. of balers	Available at Yantradhare scheme- a custom hiring centre established in selected hoblis by Karnataka State Department of Agriculture	Seven farmers have purchased apart from custom hiring centre.
Area under straw baling	1-2 ha.	>220 ha.
Compactness	3 trips	1 trip
Cost of baling (Rs/ha)	4100/-	3500/-
Straw recovery (Per cent)	60	90
Labour requirement (hr/ha)	24	4
Knowledge scores (Per cent)	2	95

knowledge of farmers regarding the baling and adoption of densification was assessed using focus group discussion method. The knowledge was imparted on baling through demonstration, group discussion, method demonstration, interactions with department and university scientists.

Similarly, ergonomic assessment was done using Rapid Entire Body Assessment (REBA) scale developed by Hignett and McAtamney (2000) for a group of ten women agricultural labours who constituted control group and were collecting the straw manually. The labour required, time consumed for baling, recovery of the straw with baler and conventional method, extent of adoption of this cost economics were calculated. Same group pre and post tests assessments were compared in adoption of paddy baler.

Drudgery of women in manual collection of the straw was assessed using the pulse rate and ergonomic assessment by REBA. The pulse rate of the respondent before and after working was recorded by inserting her thumb in the slot provided with the fingertip Pulse oximeter instrument. This simple device was used to assess the respiratory function of individual as influenced by the activity and resulting in fluctuation of pulse beats. Oximetry is a test used to measure the oxygen level (oxygen saturation) of the blood. A clip-like device called a probe is placed on a body part, such as a finger or ear lobe. The probe uses light to measure how much oxygen is in the blood. Information on utilization pattern of the straw was assessed through focus group discussion. The results were compiled and analyzed accordingly.

RESULTS AND DISCUSSION

The results indicate that, during 2014-15 there was not a single baler in the Raichur district but after conducting the demonstrations, the number of baler

Field views of demonstration of paddy straw baler

Paddy fields after harvesting with combine harvestor

Demonstration of round type baler for densification of paddy straw

Field view after baling straw

machines increased to 7 numbers. The capacity of each baler during the peak season varied between 5000 bales to 3500 bales. Thus, a total of 28,000 bales were produced. Average bales per hectare varied from 100-150. So, an average of 220 ha of paddy straw was baled. It reduced the cost from Rs. 4100/- to Rs.3500/-ha and the recovery of the straw also increased from 60 to 90 per cent with the use of paddy straw baler. This round type baler yielded about 100-150 bales /ha with average weight of the bale about 15-18 kg.

Table 2. Comparison of Drudgery scores between manual collection and baler

Treatments	Drudgery	
	Pulse rate	REBA Score
Manual collection of paddy straw	77-98	14

The drudgery scores (REBA) revealed that, manual collection of straw was highly drudgery prone activity as compared to baling. Though mechanical work cannot be compared with the manual work, the computation of drudgery scores for manual collection of straw indicated that, highest drudgery was experienced by women in bending, repeated movement of limbs while collecting the straw. This might lead to musculoskeletal disorders among women. Fluctuations in the pulse rate in doing this activity also indicated physical exertion in carrying out this activity. Acceptance of this technology was indicated by increased number of paddy straw balers. However, cost of the straw balers need to be reduced, so that all the farmers can adopt this technique of densification or should be made available on custom hiring basis at the village level.

Table 3. Utilization pattern of paddy straw in Raichur

Sr. No.	Pattern of Utilization	Percentage of utilization
1	Animal feed	98%
2	Puffed rice units and other packaging material	02%

The results of group discussion with the farmers revealed that, about 98 per cent of the straw was used as animal feed and only 2 per cent was used for other purposes like puffed rice units and package material. However, farmers revealed that these bales were sold at the rate of Rs. 2500/- tractor load if harvested by combine harvesters, and Rs. 1500/-tractor load if harvested by chain link machines. In their opinion there is heavy demand for this straw from neighboring districts also.

CONCLUSION

These results imply the need to introduce paddy straw baler in paddy growing areas as one of the components of custom hiring centre. The efforts may also be supplemented by the Department of Animal husbandry and veterinary sciences to enrich the straw before baling so as to enable the cattle to get required nutrients. After animal feed the excess straw may be fully utilized for production of energy.

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