DISSEMINATION OF SENBAKOKI (RICE THRESHING TOOL) IN MWEA

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ABSTRACT
The objective of this survey was to introduce a new rice threshing technology to the rice farmers in Mwea that is efficient and affordable. From the results obtained most farmers felt that the Senbakoki was less tedious and less time consuming. However, the results showed that the adoption rate of the Senbakoki by the farmers was low due to the constraints faced while using the Senbakoki such as sticking of the straw on the combs.

Key words: Rice thresher, Senbakoki, rice threshing efficiency

1.0 Introduction

Rice threshing is the process of separation of grain from stalks and husks. For many years, rice grain has been separated manually. The harvested rice straw is hit against a hard ground surface to separate the seeds from the stems. The hard ground is always covered with a polyethylene sheet where the seeds collect. This leads to a mixture of rice with debris of varied origin, notably soil and small pebbles; even metallic debris. Winnowing does not remove such debris completely. This is the principal cause of wear of the mill huskers which are seldom provided with pre-cleaners. This method of threshing rice is also known as the traditional method. It is tedious, very laborious and time consuming. Observing that poor threshing conditions are counter-productive from the point of view of milling and final quality of the rice, research and development bodies have worked on the design and dissemination of improved threshing technologies. The improved threshing technologies include: the threshing table, motorized threshers, votex thresher and combined harvesters (FAO, 1994). These threshers which cost 2.8-2.9 million francs CFA (~5000 $US) have a rate of separation grain straw of 99%. According to the conditions of Sub-Saharan Africa where 80% of the farmers exploit small-scale farms (Bobobee, 1993; Phillip, 1993; Faure, 1994) and 43% of the total population live below the poverty line, less than 1.00 $US per day (Sims & Kienzle, 2006). The mechanized threshers mentioned are too expensive for the common Kenyan rice farmer.

In rice production, appropriate rice threshing equipment should contribute to the broad objective of increasing the viability of the small farm. Small farmers are currently employing traditional technologies that are inefficient and they often cannot improve this technology because of the leap in scale and capital cost to commercially available equipment. It is therefore the goal of intermediate technology proponents to help fill this gap with good quality rice threshing equipment that are affordable and suited to the scale of operations of the small farmers. However, there is a tendency for equipment development and commercial firms to concentrate their energies on rice threshers that are affordable only to the wealthier farmers. This happens in part because of a focus on what technically could be done, without attention to financial constraints faced by the typical small farmer. Contributing factors include the inappropriate application of industrialized, extensive farming strategies to small intensive farming communities, and the failure to include the small farmer in the process of identifying helpful new technologies that can truly fit into the existing farming system. The result is usually either outright failure of innovations to attract interest or the consolidation of landholdings by wealthier farmers taking advantage of the newly available technology. The position of small scale farmer may become worse, and that of small farmer in general is not improved. Appropriate rice threshing technology advocates must be careful to avoid repeating these mistakes. Therefore, dissemination of a thresher with a high capacity output, available and affordable is necessary.

The Senbakoki was developed in Daikumura currently part of Takaishi City in Osaka Prefecture during the Genroka Period (1688 – 1704). It consists of a waist-high wooden frame from which teeth protrude. These teeth are made of iron or bamboo and make this agrarian tool look like a giant comb. Rice stalks are pulled through this comb to separate the grains from the stems. Until the introduction of the Senbakoki, a primitive implement called kokibashi was used to thresh rice. This was basically a split piece of bamboo, often compared to giant chopsticks, through which the stalks were pulled to remove the grains. It was slow and labourous. The Senbakoki therefore greatly improved the efficiency of threshing. However, the Senbakoki faded away after the introduction of western farming technologies during the 20th century. The introduction of the Senbakoki to the small scale farmers in Kenya will greatly improve the efficiency of threshing rice. The equipment is cheap as compared to the currently high priced combined harvesters and mechanized threshers. It is composed of cheap available materials which have been put together in a simple design to construct the equipment. It is therefore equipment that the Jua kali artisans can easily fabricate using the locally available materials and sell it cheaply to the small scale farmers.

Rice threshers (Senbakoki) were disseminated to the rice farmers in Mwea, by the Research and Extension department in Jomo Kenyatta University of Agriculture and Technology. The adoption rate of the Senbakoki by the rice farmers in Mwea was then assessed. The objective of dissemination of the

Senbakoki was to provide the rice farmers in Mwea region with an alternative, better and efficient method of threshing rice.

2.0 Methodology

Sixteen Senbakoki were disseminated in Mwea rice growing region. This was done in collaboration with the Mwea Irrigation Agricultural Development (MIAD). A questionnaire was then administered to the farmers who had used the Senbakoki. The answered questionnaires were then analyzed.

3.0 Results

85% of the respondents had used the Senbakoki rice threshing tool to thresh rice, while 15% of the respondents had not used the Senbakoki. The 15% may not have had a chance to access the Senbakoki even after hearing about it (Figure 1). 5% of the respondents felt that the use of Senbakoki was an efficient method of threshing rice while 95% felt that it was not efficient enough (Figure 2). 15% of the respondents would prefer to hire the Senbakoki, while, 85% would not (Figure 3). 15% of the respondents would prefer to buy their own Senbakoki, while 85% would not (Figure 4). The respondents cited the following as the major problems facing the use the Senbakoki; 35% said it was time consuming, 5% said they were experiencing mechanical problems, 20% said that it was tedious, 32% said that the straw stuck on the combs during threshing (Figure 5). All the farmers interviewed preferred the traditional method of threshing rice as opposed to the use of the Senbakoki threshing tool. This indicates that majority of the farmers are not ready to adopt the new technology of threshing rice.

4.0 Discussion and Conclusion

An output capacity of approximately 2 tons per day can be achieved by use of Senbakoki rice threshing tool. From the results, less complaint concerning broken grains was registered after using the Senbakoki to thresh rice. Irrational harvest and the rudimentary postharvest operations are factors of losses of rice that can reach 35%. The inefficiency of manual threshing and winnowing, seasonal drudgeries of the women and the children in Kenya worsens its losses. Damaged and broken grains sensitive to the damage of storage and commercial low value are obtained. Manual threshing and winnowing being already arduous require more labour (Azouma *et al*., 2009). The farmers felt that the Senbakoki was less tiring to use. In the Mwea rice farming zone, threshing is often carried out manually giving an output capacity ≤ 1 ton per day (Gret *et al*., 1993; Akintayo et al., 2008). The motorized and mechanized threshing-machines are practically non-existent on the sites of rice production. However, there seemed to be lack of willingness to adopt the new technology of threshing rice using the Senbakoki, by the farmers in Mwea. Although from a previous research, the method had shown to be more efficient in terms of output per acre. According to the technology adoption lifecycle model, the adoption or acceptance of a new product or innovation is in line with the demographic and psychological characteristics of defined adopter groups. The process of adoption over time is typically illustrated as a classical normal distribution or "bell curve." The model indicates that the first group of people to use a new product is called "innovators," followed by "early adopters." Next come the early and late majority, and the last group to eventually adopt a product are called "laggards." The reluctant to adopt the Senbakoki by the Mwea farmers was in line with this model. Only 5% of the farmers felt that Senbakoki was more efficient than the traditional method of threshing rice (Figure 2). These 5% of the farmers represent the innovators group. 15% of the farmers also preferred to own a Senbakoki (Figure 4). This shows that they were ready to use the Senbakoki.

The reasons behind lack of willingness to adopt the Senbakoki were as follows (Figure 5): 35% of the farmers found the method to be time consuming because one has to keep on removing stuck rice straw on the comb. 20% of the farmers found the method to be tedious. 32% of the farmers found the method cumbersome because one needs to keep on removing the straw stuck on the combs. In addition a few farmers complained about the grains hitting them on the face during threshing using the Senbakoki. Some also felt that the Senbakoki rice threshing tool is quite small in size to thresh a large amount of rice harvested. If the following concerns were addressed, more farmers in Mwea region would be ready to adopt the Senbakoki threshing tool.

The adoption of the Senbakoki by rice farmers would reduce grain losses, increase the production and improve the working conditions. In addition, there would be a drastic reduction in drudgery and improve upon the quality of threshed crops. Widely adoption of the Senbakoki would not only improve the livelihood of the farmers but also the country's economy.

5.0 Recommendations

In order for the farmers to fully accept the new technology, the following improvements should be done: The length of the combs should be reduced to minimize the tendency of the straw sticking on the combs. The spacing between the combs should also be widened; the support base is weak and thus should be reinforced number of combs per machine should be increased so as to increase the number of people working at a time; have a properly designed large sized Senbakoki rice threshing tool.

6.0 Acknowledgement

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Appendix
Figures

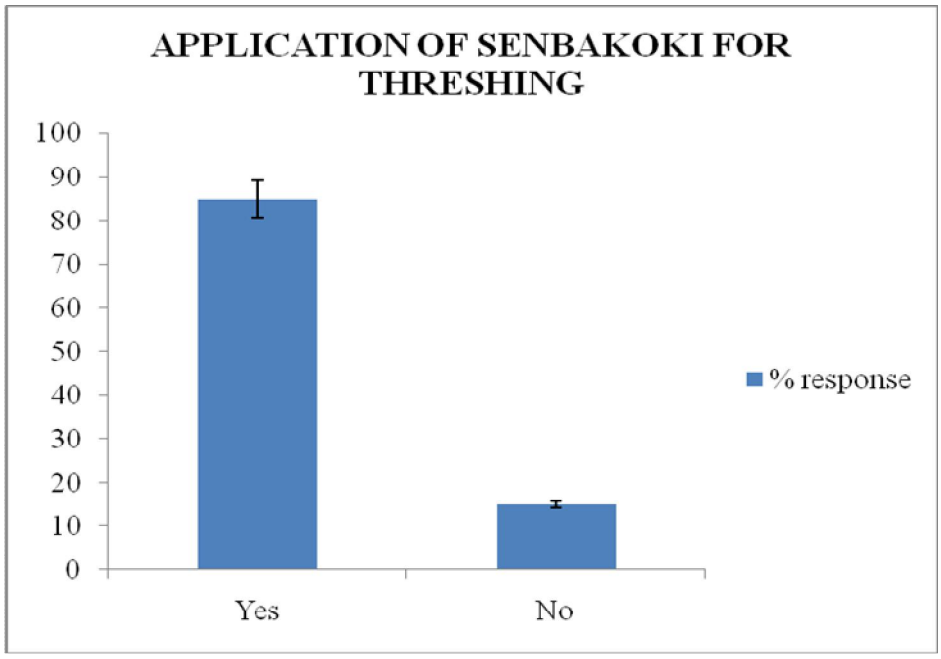

Figure 1: A graph showing the relative use (%) Senbakoki rice threshing tool by farmers in Mwea

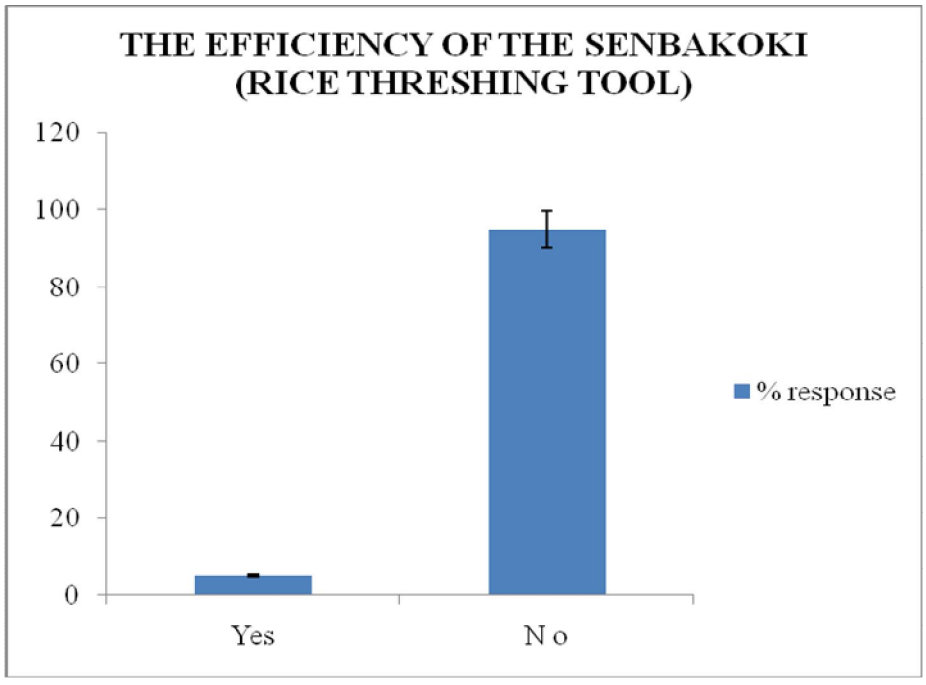

Figure 2: A graph showing the relative efficiency (%) of the Senbakoki rice threshing tool by farmers in Mwea

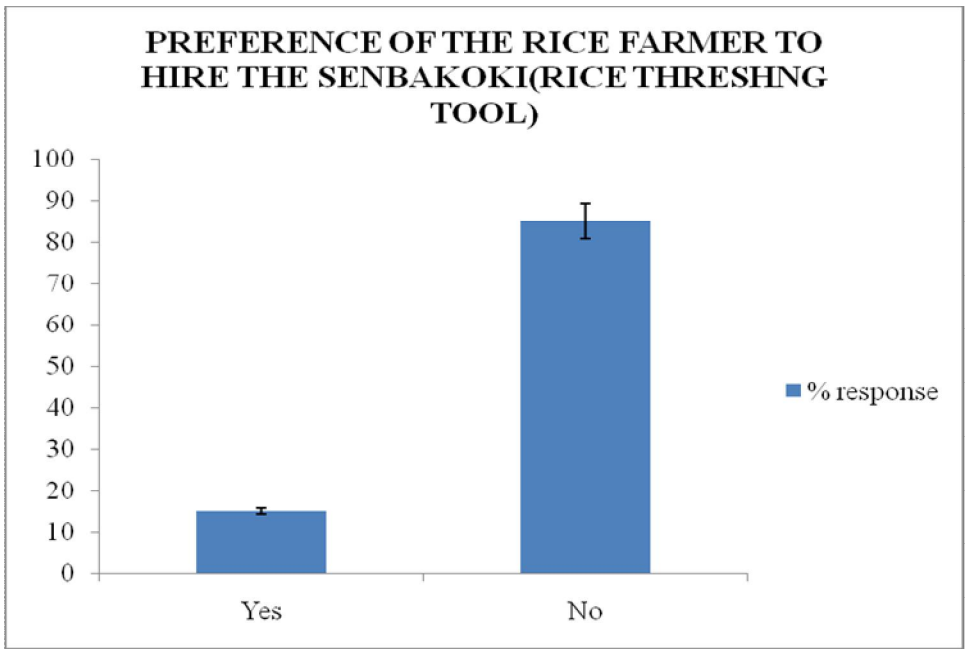

Figure 3: A graph showing relative preference (%) of the farmers in Mwea to hire a Senbakoki rice threshing tool

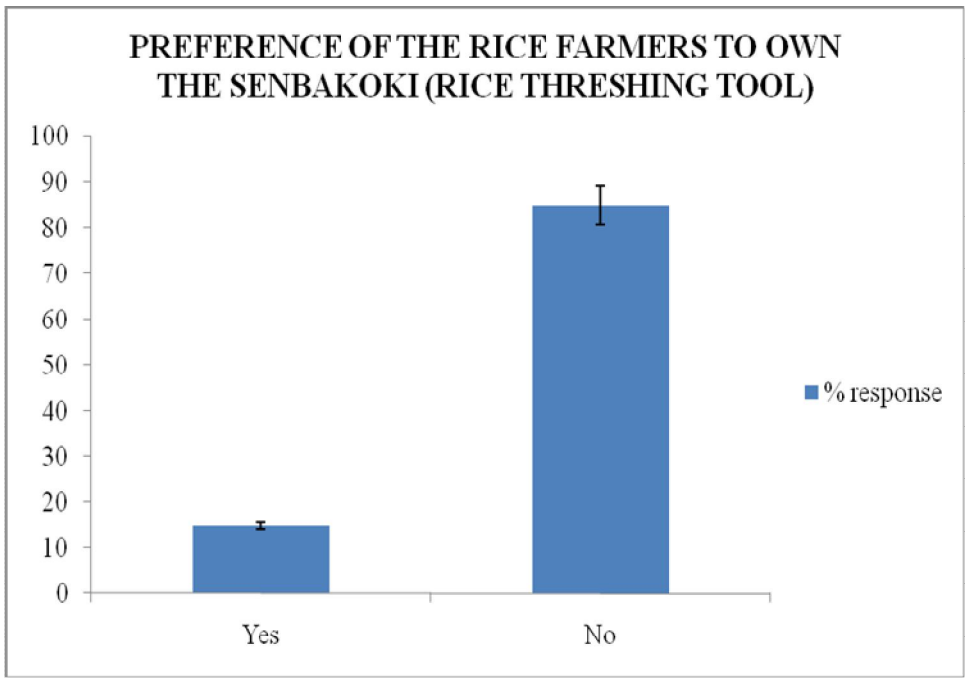

Figure 4: A graph showing relative preference (%) of the farmers in Mwea to own a Senbakoki rice threshing tool

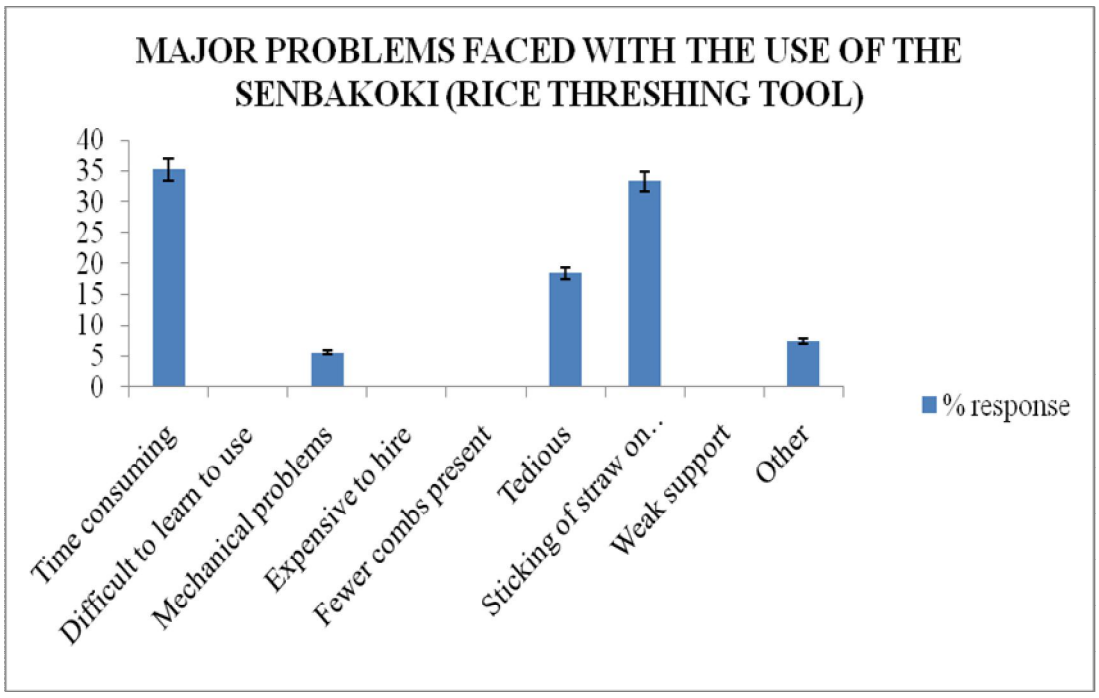

Figure 5: A graph showing the relative percentage of the problems farmers in Mwea face while using the Senbakoki rice threshing tool