

Impacts of combined seed supply system in ensuring seed quality of rice sector in Southern region of Sri Lanka

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ABSTRACT: The objectives of the research were to identify seed management practices of the combined-system paddy seed producers as well as to examine the contribution and quality of the combined paddy seed supply system compared with the formal and informal systems. The study was carried out in Udaberagama village of Hambantota district in southern province of Sri Lanka during March to June in 2013. Eighty farmers were randomly selected and categorized based on use of paddy seed systems as belonging to either the formal, informal or combined system. A farm interview survey and seed sampling for quality testing were conducted for each farmer. The farmers' combined system seed production, involved strategies of both formal and informal sector, they use formal sector seed as basic seeds and many steps of traditional techniques to ensure a good quality seeds. Analysis of the data showed that 35% of local paddy seed requirement was contributed by the combined paddy seed supply system while 16% and 49% were contributed by the formal and informal seed paddy supply systems, respectively. According to the assessment of seed qualities the combined system seeds were significantly different from informal system seeds and met the standard levels for formal system seed with respect to seed germination (87.3%), mixtures with off-types (35.6 no.per 500 grams) and insect and mechanical damaged seed (159.6 no.per 500 grams). Only seed moisture and weed seed levels of combined system seeds did not meet the standard levels for formal system seed. The combined paddy seed supply system can lead to positive impacts in the rice sector through producing and distributing good quality seeds in the local community of southern region of Sri Lanka.

Keywords: Paddy seed supply system, seed quality, seed production.

Introduction

At the present in Sri Lanka, formal (quality assured seeds, produced by recognized seed producers), informal (farmer's seed sources, managed by themselves) and combined (farmer strategy to increase the use of quality seed involving both formal and informal systems) paddy seed supply systems are contributing to fulfill the country's paddy seed demand.

The cost of production in the formal seed supply system is very high. So the seeds are more costly to the user and may not be readily available at the most appropriate time due to the production procedures. The informal seed supply system is

mainly based on farmers' local seed management practices. This makes their seeds cheaper than those produced by the formal system, as well as easily available at the right time. But the problem is that their seed quality varies widely. The low quality seed can badly affects the rice yield and the quality of the yield such as increasing high rate of mixtures with off-types, minimized the yield and even lower the quality of rice (Jiglam, 2012).

Due to the above constraints of formal and informal systems, farmers continue for several seasons to produce good quality seed from the original stock purchased from the formal sector by adapting important steps in the seed production process. That is called as combined paddy

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seed supply system. Nevertheless, production practice, its contribution to local seed demand and seed qualities compared to formal and informal seed supply systems lack of information.

Therefore, the objectives of this study were to explain seed management practices of the combined-system seed producers as well as the contributions of the formal, informal and combined paddy seed supply systems to local seed demand and to assess the seed qualities from combined seed system compared with the formal and informal system.

Materials and Methods

The study was conducted between March and July in 2013 in the village of Udabaragama in Hambantota District of the Southern Province of Sri Lanka. The village consists of 230 farm households cultivating a total of 260 hectares of irrigated rice land. In general, the study area has almost the same soil and other background conditions for rice cultivation as other locations throughout the area. In addition, it is not so difficult to access the area for field work. For these reasons of uniformity and accessibility (DOA-SL, 2012), this area was selected for the study. The primary sampling units are the individual rice producing farmers in the Udabaragama village area. Since there is not much variability among the farmer's cultural practices of rice farming in this area, simple random sampling was used to select a sample of 80 farmers.

Primary data were collected at the beginning of rice cultivation season, during March to June in 2013. A farmers interviewed survey and seed

sampling for quality testing were conducted for all the 80 randomly selected farmers. The interviews were conducted using a structured questionnaire. The data of general information (age, household income, available labor), the seed source selected by each farmer for the next season and details of the source and details of combined seed production methods were collected through the questionnaire. Seed samples were taken from the farmers' seed lots selected for the next season (except formal system paddy seed users). The seed germination percentage, seed moisture percentage, amount of other varieties distinguished in the lot, amount of insect and mechanically damaged seed, and amount of weed seed data were tested from the seed testing laboratory of the Department of Agriculture in Sri Lanka. Secondary data were collected from the seed and planting material zonal office, the district agriculture extension office, agrarian service centers and the seed testing laboratory.

Farmers were categorized based on use of paddy seed systems as belonging to either the formal, informal or combined system. The structured questionnaire was administered to categorize the farmers. The number of farmers in each available paddy seed sources in the area, based on farmers' selection of their seed source for the next season was used to calculate contributions of the formal, informal and combined seed paddy supply systems to local seed demand.

Analysis of variance was conducted to compare seed quality conditions among the formal, informal and combined seed supply systems by General Linear Model (GLM) using SPSS package program version 13.0 (SPSS Inc.).

Results and Discussion

The survey covered a total of 80 farmers. Most of the farmers in the study samples are over 50 years of age and their average rice farming experience is 26 years. Their farm families consisted of average 2 available family labors for rice farming. More than 80% of farmers in the study area had completed secondary education. The average land size is 1.2 ha and all farmers have their own land for rice cultivation. All farmers' main income source is rice farming and all of them have been using the same rice variety (AT 362) for more than 10 years.

Seed management practices of the combined-system seed producers

The most important practices of those producers are frequently use formal sector seed as basic seed to their seed production and they follow some steps to ensure good quality of their seed. Those steps are, farmer takes special care of the field by removing the tall rice plants which are higher than the crop locally known as "usa pela", they also remove weeds from the field, the fields look like "golden color" at the time of harvest, After harvesting paddy seed should be dried under the sun until get "taks" sound when threshing by teethes, Farmers clean their seeds by winnowing to separate the light grains from heavy grains. For further cleaning of seeds, some farm-

ers place the seeds in a container with water and light grains float on the water. They adapt the floatation method and advise to farmers who are using their seed to do the same thing before planting in the next season. If there are much more tall rice plants in their field, they know it is time to select certified seed from formal sector for the next season. According to the above farmers' seed multiplication steps, they have involved strategies of both formal and informal sector.

Contributions of paddy seed supply systems to local seed demand

According to the calculation, contributions of the formal, informal and combined paddy seed supply systems to meet local seed demand are shown in **Figure 1**. In the study area majority of farmers use informal system paddy seed such as saved seed from their previous crop or borrowed from neighboring farmers for their seed requirement. According to the data the previously recorded formal, combined and informal paddy seed supply systems contribution to the national paddy seed requirement were 15%, 35% and 50% respectively (Senevirathna et al., 2008). It was almost the same as contributions recorded in the present study for the local seed demand of which 16% is supplied through formal paddy seed supply system and another 35% by combined seed paddy supply system. Balance 49% is supplied from informal paddy seed supply system.

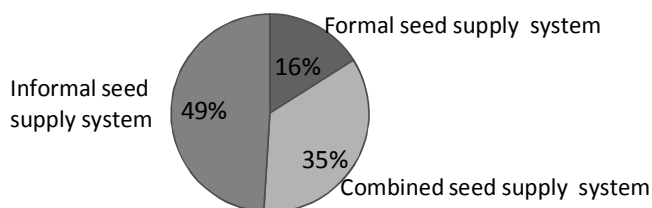


Figure 1 Contribution of the formal, informal and combined seed paddy supply systems to meet local seed demand

Seed qualities of combined-system comparing to the formal and informal system

According to the seed quality conditions obtained from seed quality testing reports, the combined system seed qualities are highly significant different ($P < 0.01$) from informal system seeds in terms of seed germination, mixtures with off-types and weed seed (**Figure 2**). Further combined system seeds met the standard levels for formal system seed with respect to seed germination (85%), mixtures with off-types (100 per 500 grams) and insect and mechanical damage seed (200 per 500 grams) indicating that seeds produced from combined systems are good quality as well as formal seed. Only seed moisture and weed seed levels of combined system seeds were poorer than the standard levels for formal system seed. However, combined system seed users adapt to one more seed cleaning step just before using the seed for the next season. That is floatation method and it is helped to removing weed seeds again from the seed lot. Furthermore, in Sri Lanka, rice is produced 2 times a year, combined system paddy seeds from previous season are used only for the next season. So the seeds are kept for only a short duration for (2-3 months) the next season. Their moisture content need not to be as low as those to be stored for 8-10 months

as in the case of formal sector. According to the seed quality condition, rice farmers are able to have good quality seeds through combined paddy seed supply systems. In Thailand community rice seed system (Jiglam, 2012), in Vietnam rice seed club (Huynh et al, 2011) and local seed growers systems (Le, 2003) are recognized as quality paddy seed supplying units collaborating with formal and informal sector in their countries.

Conclusions

It should be emphasized that any strategy to increase the usage of quality seed in the rice sector must involve both formal and informal seed supply systems. It is an opportunity for the rural farmers to have good quality seed without displacing their traditional way of seed exchanging. In Sri Lanka combined system seed paddy producers have been playing that key role in southern region of the country. It is necessary to recognize this important situation by relevant authorities. And priority should be given to facilitate activities such as basic seed allocation, financial support by bank and provide closer extension service for the viable combined system paddy seed producers in major rice producing areas in the country.

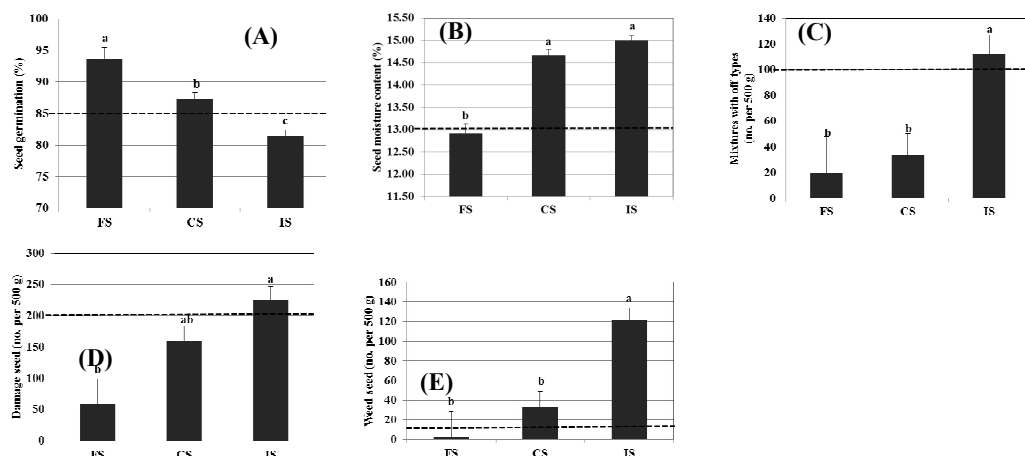


Figure 2 Seed quality conditions, (A) seed germination, (B) seed moisture content, (C) mixtures of off types, (D) damage seed and (E) weed seed, of formal, informal and combined seed supply systems compared with the standard levels for formal system seed. FS, CS and IS= formal, combined and informal seed

Acknowledgement

This study is financially supported by Thailand International Development Cooperation Agency (TICA), Ministry of Foreign Affairs, Thailand.

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