

Reducing Production Costs of Jasmine Rice with Quality Control Circle (QCC)

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Abstract

Our research objective was to find ways to reduce the cost of growing jasmine rice in Chachoengsao, Thailand. The finding revealed that the estimated costs of production were high up to 4,403.39 baht/rai with an average yield of 467.62 kg/rai. The transfer of technology with a Quality Control Circle was proposed to reduce costs of production. Attempts were made to determine the problem solving of risk management before and after the application, and analyzed the cost of problems using technique QC 3 tools, i.e., check sheet, Pareto diagram, and the cause and effect diagram. It was found that the cost of process of the soil-preparation using fertilization for the cultivation was high at 1,400.32 baht/rai due to the lack of soil-analysis before planting rice. In order to rectify the problem, it was recommended that a team work should be applied with a Quality Control Circle. The training methods comprised of an analysis of the soil samples, and the techniques of using simple analysis kits. The results of the trained methods could reduce the cost of fertilizer application down to only 468 baht/rai or 66.57 percent.

Keywords: Jasmine rice, costs reduction, QCC.

Introduction

In present rice is important in the economy of the country. It is the cornerstone of the whole countries in terms of economy, society, culture, rice cultivation areas of about 56 to 68 million hectares per year, which are the major areas of production and off-season or equivalent to 40 percent of agricultural land across the country. The exports can also raise the money and currency in the country. Exports have increased every year due to Thailand's advantages in the quality and standard of rice. The uniqueness of rice products in Thailand is a popular food throughout the country. It has been shown that in the world market by the year 2001 to the year 2010, the amount of rice export was 84,300,250 tons, which was equivalent to 1,179,223 million baht, where the Jasmine races 105 varieties were very famous in Thailand. The estimated areas of cultivation are approximately 18,631,473 acres throughout the country, whereas in the Northeastern Thailand it has been estimated that an area of 15,383,756 acres of crops have been cultivated in the ThungKula area. It was reported that the second large area ranging from 2,107,681 acres to 2,021,954 acres, in the northern Thailand, which was covered an area of 1,220,871 acres (Office of Agricultural Economics, 2011).

However, Thailand has suffered from the low cost of production of rice in the country during the mid-season between the year 2001 and 2011, where it has suffered for the second year in February 2011. It was found that the costs of the paddy were 7530 baht average productions per ton (Office of Agricultural Economics, 2011) during the day, the Department established milling. On the occasion of the fifth anniversary year and advanced to the 6th anniversary of the Department of Rice, Rice County Social worker routine accordingly, the Department's policy is emphasized to improve the quality of Thai peasant farmers, and set up a new policy to reduce the production costs. The spring's new is connected to this body of knowledge on the subject of reducing the cost of production for farmers to achieve, where the strong activity in community centers and peasant farmers can lead to sustainable competitive in the global market. (Department of News, Reporting, 2011)

It had been estimated that reserved areas for rice cultivation in Chachoengsao province especially for Jasmine rice 105 was 96,408 acres, where the yield of rice was 335 kg per hectare. Jasmine rice 105 has been found to be of good quality rice for the first time and established in Thailand, which has been known all over the world over the last 10 years, where farmers have turned to grow as rice crop substitution. The decreasing in the production of Jasmine rice 105 was approximately 19.42 percent from 10 years ago, which was due to the high cost of producing rice (Office of Agricultural Economics, 2011), resulted in decreasing in the Jasmine rice 105 cultivation. So, it is of interesting to find ways to reduce the cost of rice cultivation especially for the Jasmine rice 105 in Chachoengsao province, and offer instructions according to the policy of the Department of Rice to reduce the cost of production of rice.

Research Methods

Researchers explored the area, which planted with rice and hand out questionnaires. The participants were interviewed with relevant theory and research. Quality Control Circle: QCC and the proposal of how to reduce the cost of growing Jasmine rice 105 were distributed in Bangkhla district, Chachoengsao province. All details and steps used were as follows:

1) How to create a query tool that was used for this research study? Queries made by applying the test accuracy and test with a confidence value. Accuracy was scrutinized by a panel of experts to examine the content validity of the questionnaire in order to ensure the accuracy and precision of the content-oriented queries before use.

2) An analysis of the costs of production of Jasmine rice 105 in Chachoengsao province by using field data, which all queries about the cost of the entire production process were obtained from the cultivation in the selected areas, the harvesting and storage, and the information that distributed with a Check Sheet.

3) Transferred of technology, which could help to reduce costs with the Quality Control Circle with the applications and operating systems that aimed to reduce the costs by group QCC (farmers).

3.1 Attempts were made to trained the farmers to participate in using all technologies regarding to the agricultural production system that suitable for Jasmine rice 105 (GAP) and how to cut costs at every stage in the production process for the production of Jasmine rice 105 in Bangkhla district, Chachoengsao province. All attempts were done in collaboration with the provincial Department of Agriculture and the Department of Clay Pot Rice and a Stud Farm.

3.2 The application of Training Quality Control Circle, QC Story, and QC 7 tool was done to analyze and find the cause of the problem during the cost of production of Jasmine rice 105.

3.3 Establishment of cost reduction activities for the Jasmine Rice 105 after training, where the first group was dealing with statements a fixed group.

4) An analysis of all causes of problems with the Quality Control Circle with QC 7 tools, where the third one consisted of a check sheet, Pareto diagram, and fishbone diagrams or cause, and effect diagram profile, as follows:

4.1 The distribution of a check sheet was used to determine the elimination of the Jasmine rice 105's services. The process of preparing soil for the harvesting and storage awareness, the cause of the problem, and the cost of rice production, were given at the beginning of the season.

4.2 The Pareto Diagram was applied to compare and see if the individual were very important. The only different was that it was used as a guide in selecting a major cause analysis and to find the correct one.

4.3 The cause and effect diagram was used to analyze factors, that could cause an impact on the process of planting rice in both the real and the sub-factors. The factors that affected the cost of cultivation derived from the analysis of the abovementioned diagram were farmers or equivalent to man in the diagram, raw materials that were used in the rice cultivation (chemical fertilizers especially the Eagles that allowed only eliminate pests), and methods or process of rice cultivation, which emphasized on maintenance of the cultivation by using fertilizers.

5) The proposed amendments to reduce the cost of growing Jasmine rice 105 were distributed to all farmers.

Results and Discussion

1) The cost of production of Jasmine rice 105 in Chachoengsao province was analyzed with the adoption. The data from the survey revealed that the costs of production processes were started from the cultivation, the preparation of seedling, maintenance processes of rice cultivation, harvest and post harvest or storage of rice.

1.1 Results of analysis of the data from the Check Sheet regarding the production cost of Jasmine rice 105 survey questionnaires revealed that the average age of farmers was over 51 years old with a very low level in education, i.e., as in an elementary school or lower. In general, the combination of organic fertilizers and chemicals were used in rice cultivation in the study area, without the application of Good Agriculture Practices: GAP). The soil structure was consisted mostly of clay in the lowland areas, where water was brought in from the irrigated canal. The sole sources of water were from the canal with some parts from rainwater, which were important factors of the production costs where it brought up the cost to 4403.39 baths per rai. The factor that raised the production cost was the use of the fertilizer, where the cost was as high as of 1,400.32 baht per rai with an average of rice production at 467.62 kg per rai.

2) Results of the application and of operating system costs by reducing the Quality Control Circle (farmers) were obtained as described below.

2.1 The process of training for volunteer farmers in agriculture in Chachoengsao province was done with the assistance of personnel's of the Research Office, and authorities from the provincial Agriculture Department. The topic of the technology transfer was to reduce the cost of fertilizer's utilization, which was taken place on 26 to 27 January 2012. It was shown that the topics and content were relevant to the topic of the research and the research community very well. The lectures were done by authorities from the provincial Department of Agriculture, where the topic regarding the harmony of teamwork related to the Quality Control Circle in subjects and were given to 150 participants from the village. It was found that results of survey by questionnaire and the test of a representative sample of the total 109 cases had an average score of knowledge between 2.99 to 3.91, with a median of total sample at 3.66, the value of differences in opinion was 0.28 percent. There was an overview of all opinions fell in the most categories.

2.2 It was shown that those farmers who attended the training of Quality Control Circle could use the knowledge as a self-knowledge. They understood the function and were able to use it as a tool to analyze the problem properly, and gained a good attitude regarding rice plantation. Rice farmers were able to use the experience from the field and from the Quality Control Circle to apply in order to reduce costs, and gained benefit after the operation. They gave a harmony and respect to each other feedback of other people's comments.

2.3 Regarding to the establishment of a Quality Control Circle from the Training knowledge, attempt to establish the Quality Control Circle group as a separate group was made. One group formed by 10 people were called as BangKhla common group, and set up group motto as "reduce cost, increase productivity, brainstorming to

achieve some goals". The author served as a consultant to the group. This activity was carried out on February 15, 2012.

2.4 An analysis of the cause of the problem with the Quality Control Circle, and the operations to improve cost reduction could be described by Rice and results analysis, where details were summarized as follows:

2.4.1 Results of the use of Check Sheet to determine the distribution of data regarding to the cost of Jasmine rice 105 from the three processes, below the soil after harvest, and the conduct.

Table 1. Showing details the costs of farmers planting Jasmine rice 105 at Bangkhla district, Chachoengsao province.

| The process of growing | | Costs. (baht / rai) | Percentage |
|--|---|------------------------|------------|
| Maintenance (fertilizer) | A | 1400.32. | 31.80 |
| Harvest management | B | 1131.38 | 25.70 |
| Post-harvest practices | C | 536.75 | 12.18 |
| The cedar tree seeds State | D | 419.90 | 9.53 |
| How to transplant | E | 277.20 | 6.30 |
| Management or production areas | F | 242.28 | 5.50 |
| State of the soil | G | 221.16 | 5.02 |
| Eliminate the disease, insects and animal protection Prof Instruments rice | H | 174.40 | 3.97 |
| Total | | 4,403.39 | 100.00 |

2.4.2 Results of the use of Pareto Diagram to compare the results of other factors that might cause the problem suggested that the cost of processes of care (fertilizer) was high, while the rice was first considered. A value of 1,400.32 baht / rai or 31.80 percent was obtained, so there was a need to find solutions first. Details are summarized in Figure 1.

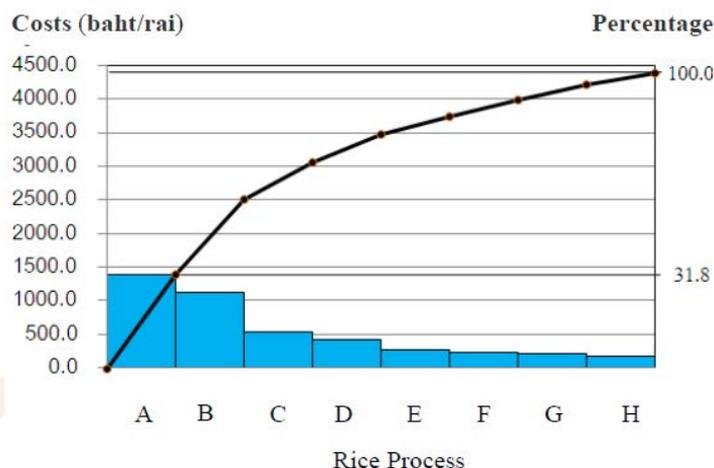


Figure 1. Showing Pareto diagram comparing the importance of the cause of the problem.

2.4.3 Results of the use of fishbone diagrams or cause-and-effect diagrams showing the amount of fund that they spent were summarized as shown in Figure 2. QCC members appeared in the brain that causes the costs of care (fertilizer) due to higher inputs. In many aspects, the lack of knowledge of the process, such as the lack of soil to determine the soil before planting crops was discovered. It was also found that the yield was less after checking the soil. Thus, the question was raised whether there was a way to use the same fertilizer. The use of fertilizers as the raw materials was not quite convinced. The summary of their believe concerning the quality of the fertilizer is shown in Figure 2.

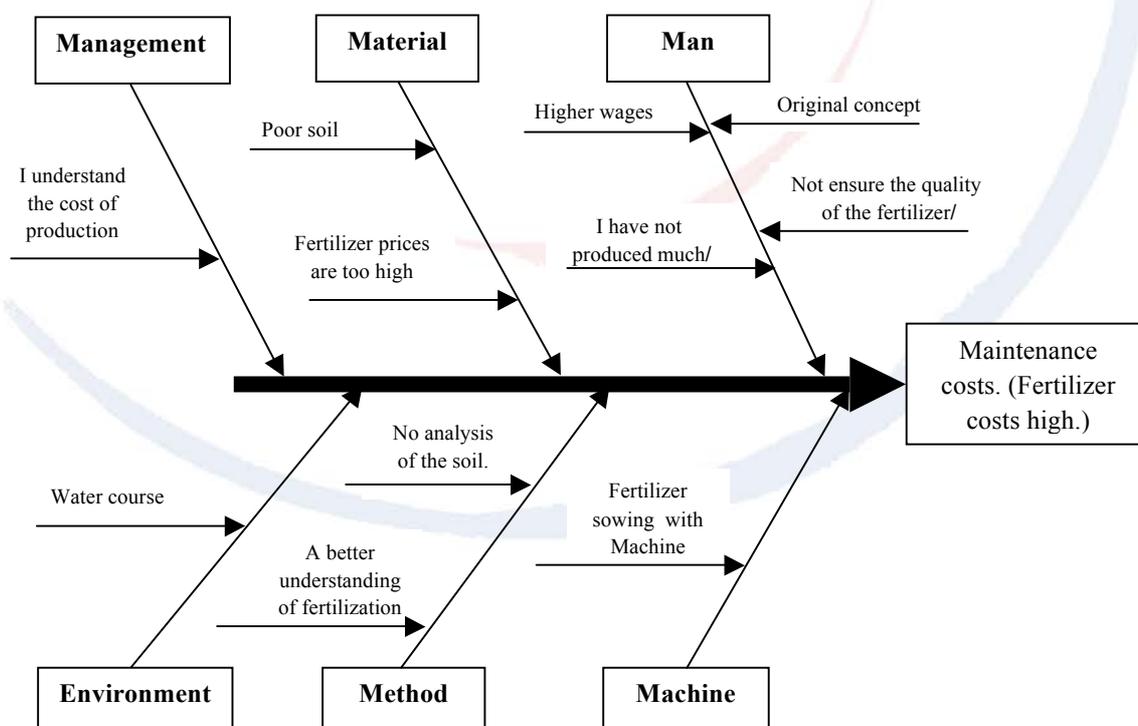


Figure 2. Showing the Cause-and-effect diagrams of the fertilizer
 3) The proposed improvement and cost reduction for jasmine rice 105.

3.1. The farmer should be trained to increase the farmer's knowledge. If the box was checked, fertilizers and chemicals, such as pesticides and herbicides, they should check for quality and contamination.

3.2. The training samples should be applied to analyze the soil properly, the method of training should be practiced in the actual field.

3.3. The training process on how to use the operating instructions for the management of soil and fertilizer plots should be emphasized.

Conclusion

1) The method of collecting of information using the survey with interviewing and complete questionnaires revealed that most farmers had an average age of over 51 years old, with a very low level in education, which was as low as elementary school or lower. They used the combination of organic fertilizers and chemicals without the application of GAP. They have known how to cultivate the good and proper farming rice (Good Agriculture Practices: GAP). Most of the characteristics of land are mostly flat, where clay was the main component of the soil. The main source of water was from canal with some supplements from rainwater. Water from irrigation canal and rainwater pushed the production costs up to 4403.39 baht per rai. The steps that lead to the highest-cost maintenance (fertilizer) have amounted to 1400.32 baht per rai. The average yield per acre is 467.62 kg per rai.

2) The transfer of technology to reduce costs with the Quality Control Circle should be done by training farmers and recommend to form a group. The participants were interested in the group QCC as a way to solve a large percentage of the manufacturing cost. After training, farmers who were trained under the project gained the knowledge and get benefits from this kind of partnership the worked as teamwork. They learned how to listen to opinions of the others, were able to use as a tool to analyze the problem correctly. It was noted that the process of maintenance of rice plantation (fertilizer) was the major factor that increase the costs of production. The farmers were lack of knowledge to analyze the soil before planting crops, and check the soil. Is there a way to use the same fertilizers? The use of fertilizers is the raw material or not. It is very important to ensure the quality of the farmers through training, fertilizer, soil sampling and analysis of the soil before planting. According to the analysis of rice and fertilizer, it was recommended that farmers should pay attention on the management of soil and fertilizer, and the conversion of the land, which allowed farmers to reduce fertilizer costs only 468 baht / rai. 66.57 percent.

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