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## **Study on the causes and weedy rice management of farmers in Lumplatiw community, Ladkrabang district, Bangkok Metropolitan, Thailand**

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**Abstract** Results showed that the most farmers were males, and averaged age was 57 years old. The majority of marital status were married. 50% which educated from primary school. Their average income was 7,000 baht per month. 40% of them purchased rice seeds from local shops. 80% of them cultivated Pathum Thani 1 jasmin rice. The average farm area was 26.6 Rai. The average length of time with weedy rice problem was faced for 5.2 years. Farmers estimated that weedy rice penetrated 27% of their cultivated fields. Their expected to produce prior of spread of weedy rice was 955 Kg./Rai, and 780 Kg./Rai. Major causes for weedy rice included the rice seed source from local shops may be not reliable. The weedy rice might be encountered at farming equipment. By repeatedly cultivation, the same type of production was done time to time. Farmers currently solved the problem by cut weedy rice before it matures, lured the weedy rice for plowing, let the weedy rice wilt, and avoid continuously restarted by rapidly planting. Farmers were tried these techniques. There seemed to be not improved the weedy rice problem. Thus, there should be collaborated among farmers, agents and local researchers to formulate an effective action plan that would be logical and proper for this community.

**Keywords:** Weedy Rice Management, Weedy Rice

### **Introduction**

Rice has always been cultivated a major agriculture in Thailand. The size of the rice field in Thailand is approximated to be 70 million Rais and produce 30 million tons of rice. This equals to an average of 541 Kg./Rai (Office of agricultural economics, 2016). With the demand on rice keep rising and without proper knowledge to manage rice cultivation, traditional cultivation is ignored. Land has been repeated cultivated over and over to keep up with the demand. As the result, the yield per Rai has fallen. There comes weedy rice problem.

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Farmers in Central region up to the Southern part of Northern region have been facing with a serious weed called weedy rice. Weedy rice is variation of rice between farmers' featured rice and local rice. Thus, it looks alike to featured rice during sprout period (Jitrakorn *et al.*, 1995). It has different names at different part of the country for example "Khaw Harng, Khaw Nok, Khaw Deed, Khaw Deng, Khaw Lai or Khaw Dang" (Maneechote, 2005). Khaw Harng or Khaw Deed are a special kind of weedy rice. It has special characteristic. The grains will loose from the weedy rice resulting losing feature grains from 10 – 100% depending on its density (Maneechote *et al.*, 2004). Early stage of the problem, there would be only a few weedy rice. Within a few season of cultivation, weedy rice will outgrow featured rice such that farmer see none of featured rice. The outbreak area shows trend of expansion and become a serious threat to rice cultivation from Central region to lower Northern region (Maneechote, 2005).

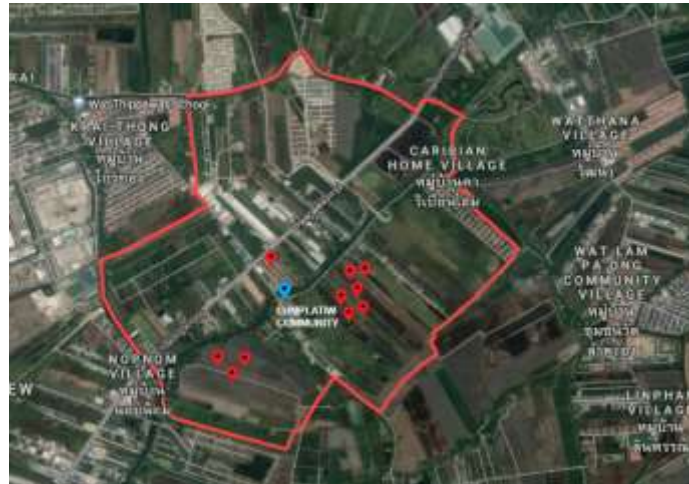
Bangkok has been regulated by Ministry of Agriculture and Cooperatives for agriculture space. MOAC announced particular area on the East side of Bangkok for rice cultivation in 25 sub districts in 5 districts namely Saimai, Nongjork, Klongsamwa, Ladkrabang, and Minburi. The area location is suitable for rice cultivation and covers 119,891 Rais. The size accounts for 97% of rice cultivation in Bangkok. Lamplatiw in Ladkrabang rice cultivation covers 4,770 Rais (Bangkok agricultural extension office, 2014). Lamplatiw rice cultivation fields harshly suffer from weedy rice. Farmers' produce severely decreased compared to prior to the weedy rice problem. Farmers often just cut the weedy rice grains and throw away. Obviously, this is not good enough action. It waste time, labor, and cost of the labor.

It is, thus, important to properly study the cause of the problem as well as a plan to manage the weedy rice problem in Lamplatiw cannel area, Ladkrabang, Bangkok. The information gained from this study would lead to a solid analyze process to develop a model to manage weedy rice for this area. The model could be adapted to other area.

## **Materials and methods**

This study was began with a qualitative data collection by focus group and in-depth interviews from key informants. Specific samples were 10 farmers with the weedy rice problem in the area as shown in figure 1.

The steps for data collection were done as follows:-\_to obtain information from documents during initiation, to obtain information from the locals. A focus group was conducted (Figure 2) and the weedy rice problem was identified.



**Figure 1.** locations of sample rice fields



**Figure 2.** Focus group with the locals in Lamplathi area

The general background information was obtained into detail problem for causing and the informant's handling method of weedy rice problem via in depth interview (semi-structure interview), and non-participant observation as well as a survey to the field with the informant (Figure 3).



**Figure 3.** In depth interview and an a survey

Descriptive statistic techniques such as percentage or average value are processed on basic information. Triangulation technique is used for analyzing causes and identify plan for handling the weedy rice problem.

## Results

The cause and identify a plan to manage weedy rice for farmers in Lamplatiw area was identified.

**Basic Information on farmers :** 90% of informants are male, 50 % of informants' age are between 41-60 years old, 40% and 10% for age 61 or up and 21 – 40 years old respectively. The average age of informants was 57 years old, 80% of the informants marital status was married, the others 20% was single, 50% of informants educated in primary schools. The other 50% stated as junior high level. 90% of the informants stated their income of 5,000 – 10,000 baht per month. The other 10% stated higher than 10,000 baht per month and the average income was 7,500 baht per month.

The seeds source were as follows:- 40% of informants bought seeds from local shops, other shops, self collection, and bought from a relatives with the percentage of 30, 20, and 10% respectively. 80% of the farmers who cultivated Pathumtani 1 variety, the others varieties included RD 47 (Rice Department 47) and RD 51 of 10% (Table 1).

**Table 1.** Basic informant data

Item	Count (n = 10)	Percentage
1. Gender		
- Male	9	90.00
- Female	1	10.00
2. Age (years)		
- 21-40	1	10.00
- 41-60	5	50.00
- 61 or up	4	40.00
<b>average 57 (S.D. =12.93)</b>		
3. Marital Status		
- Married	8	80.00
- Single	2	20.00
4. Education Level		
- primary school	5	50.00
- junior high school	5	50.00
5. income per month (baht)		
- 5,000 – 10,000	9	90.00
- 10,001 or up	1	10.00
<b>average 7,500 (S.D. =2592.72)</b>		
6. Rice seeds source		
- local shops	4	40.00
- other shops	3	30.00
- self collection	2	20.00
- from relative	1	10.00
7. Rice breed		
- Pathumtani 1	8	80.00
- RD 47	1	10.00
- RD 51	1	10.00

### *The weedy rice problem in Lamplatiw*

Informants cultivated rice averaged 26.6 rai per person. The averaged time had encountered the problem for 5.2 years. The estimated amount of weedy rice in one field was 27%. The harvested time prior to weedy rice outbreak yielded averaged 955 kg./rai. The averaged yield was lost to 780 kg/rai. (Table 2).

**Table 2.** Facts on weedy rice problem in Lamplatiw (n=10)

Item	Average	S.D.	Max	Min
1. Field size (rai)	26.6	13.13	45	10
2. Time encountered weedy rice problem (years)	5.2	2.52	10	2
3. Estimated amount of weedy rice (%)	27.0	10.59	50	10
4. Rice yield harvested prior to weedy rice outbreak	955.0	89.59	1,100	800
5. Rice yield harvested after weedy rice outbreak	780.0	103.27	900	600

### *Types of weedy rice in Lamplatiw*

There were 3 types of weedy rice in Lamplatiw as follows:-the seed tip is long hair in white or red. The weedy rice stem is taller than normal rice. It produces ear of grain 10 – 15 days before normal rice does which the locals called “Khaw Harng or Khaw Nok Harng Ma” (Figure 4). The seeds appearance are brown sugar color in whole or stripped. It is similar to normal rice. The locals called “Khaw Dang or Khaw Lai” (Figure 5). The stem is similar to Khaw Harng, but the seeds are is shorter than the normal rice. The seed’s tail is short or none. It produces ear of grain 10 – 15 days before before normal rice does. Its ear of grain is dense. The locals called “Khaw Deed or Khaw Deng” (Figure 6).

### *Growing Rice in Lamplatiw*

Farmers in Lamplatiw Ladkrabang Bangkok preferred on sowing seed technique. Farmers are cultivated twice a year. Each planting season takes 4 months. Typical steps of growing rice were as follows:- 1) Farmers acquired their seeds whether via local shops, other shops, self collections, or purchase from relative. 2) Level the ground, a tiny waterway at the paddle ridge allows the farmer to control the amount of water level for sowing seeds. Three kinds of plowings are commonly done. First plowing is to get rid of stalks. The second plowing does after the first plowing for 2-4 weeks to prepare the soil proper to planting. The grasses were removed. The third plowing is to adjust soil level. 3) The prepared seeds for sowing, the seeds were soaked in clean water for 12 – 24 hours brought out and kept moisture for 30-48 hours before sowing into the rice field. 4) Control pests and weed were done by water flooding and chemical pesticides. 5) Apply chemical fertilizers included ammonia phosphate fertilizer e.g. 16-20-0, 18-20=0, 20-

20-0 or 18-46-0 at 30 – 35 kg./rai after 20 – 30 days from sowing, urea fertilizer (46-0-0) at 40 kg./rai. during panicle initiation stage or 30 days before panicle stage 6) Harvesting time was done at 105 days after planting. The combine harvester could result to get the weedy rice seeds from another paddle to cause problem for next cultivation.



**Figure 4.** Khaw Nok Harnng Ma in Lamplatiw



**Figure 5.** Khaw Dang, Khaw Lai (stripped) in Lamplatiw



**Figure 6.** Khaw Deed in Lamplatiw

### ***Causes the weedy rice problem***

Based from growing rice in Lamplatiw in the previous section, the investigation was identified the causes of the problem as follows:-

1) Farmers obtained the rice seeds with low quality sources. Weedy rice seeds could come from any of the 4 sources – local shops, other shops, self collection, and buying from relatives. 2) the weedy rice seeds could come with farming equipments. 3) the field is continuously cultivated rice planting. The resting field before planting could cause weedy rice seeds wilt.

### *Present methods handling weedy rice problem in Lamplatiw*

How the farmers controlled the weedy rice problem was shown in Table 3.

**Table 3.** How farmers in Lamplatiw handle weedy rice problem

No.	Name	Methods to remove weedy rice				Num ber hired	Expense (baht)	
		Cut the ear of grain Self	Hire	Lure the weedy	Rest the paddle		@person	@rai
1.	Prasit Tongloi	-	√	√	-	5	300	-
2.	Somsak Prawsee	-	√	√	-	3	350	-
3.	Prasit Sawangkarn	-	√	√	-	-	-	150
4.	Boonnak Laefang	√	√	-	-	1	350	-
5.	Somjit Laefang	√	-	-	-	-	-	-
6.	Boonsap Sawangprasriarray	-	-	-	√	-	-	-
7.	Satien Prajongjak	√	-	√	-	-	-	-
8.	Wichean Chuanpae	-	√	√	-	5	300	-
9.	Udom Laefang	√	-	√	-	-	-	-
10.	Worawoot Sawangprasriarray	√	√	-	-	-	-	150



**Figure 7.** cutting ear of weedy rice with rice sickle



From this study, there were 3 methods to get rid of weedy rice by the farmers in the community as 1) cutting the ear of rice to prevent the ripe seeds fall to the paddy field. This method is performed either cut them by rice sickle (see Figure 7) or weedy rice cutting tool. It is common that the farmer hired labor to do which averaged 150 baht per rai.

The paddle was prepared for new cultivation, after plowing, leaved the paddle for 15 – 25 days to allow weedy rice and pest to grow. A trick for this technique was to keep the paddle day for 10 days prior to harvest and let the paddle continued to dry at least 1 week after harvest then let the water got into the paddle. Weedy rice and pest plants will grow and plowing again. This technique can remove only part of weedy rice. Luring is usually performed only once before cultivation. “Lure rice means we trick the weedy rice that the cultivation had already started. It takes 1 month or 25 days. Once the pest grew, then plowing. This helps to decrease the number of Khaw Nok and Khaw Deed” (Somsak Prawsee, interview). “Lure them to raise, preparing the soil as starting to plant but no sowing. Lure them for 15 days then plow, then starting to plant” (Wichean Chuanpae, interview).

Resting, the paddle, let the soil dry, weedy rice grain would be wilt. Boonsap Sawangprasriarray performed this technique I in Lamplatiw.. Boonsap’s paddle rarely contains weedy rice (Figure 8). He stated that it was necessary to rest the paddle. Thus, the paddle is rest for 8 – 9 months then the weedy seeds were wilted before cultivation. The paddle soil is hardly contained any weedy rice” (Boonsap Sawangprasriarray, interview).



**Figure 8.** Boonsap Sawangprasriarray’s field

Farmers in Lamplatiw have never used the chemicals to kill weedy rice because it was never success due to weedy rice is resistant to chemicals.



## Discussion

From our study, weedy rice in Lamplatiw is caused by the following. 1) Farmers purchase rice seeds from low quality shops. This include local shops, self-collecting, buy from relatives. Purchasing from more reliable source could help the problem. 2) From planting equipments such as plowing tools, combine harvesters. Combine harvesters could carry weedy rice grains if they have just harvested from outbreak fields. The seeds from harvesters are likely to cause outbreak in destination field during threshing. 3) Repeatedly cultivation produces without resting the soil also explains the cause of weedy rice problem because there was no opportunity to remove pests. The situation is consistent to Tubtawee (2007) which confirmed the similar situation for the problem origin. The cause of the weedy rice in Baandonkwang was caused by weedy rice grains were with featured rice grains. Less than 7 days after harvesting, farmers started sowing. This commercial style cultivation prevented the farmers to remove foreign grains. Farmers do not aware that cleaning their tools is a way to prevent weedy rice. In this study, 3 methods that local farmers implement to manage weedy rice. 1) cut the young ear of grain to prevent the ripe grain fall onto the ground. 2) lure the weedy rice was done by let the weedy rice grew before plowing and starting normal planting process. The result of this method is consistent with Na Nongkhai and Thongsima (2008). In the study, the farmers who managed weedy rice with only luring method, still loss yield of rice and 3) resting the rice field to dry by destroying the weedy rice.

It is concluded that farmers in Lamplatiw have been managed the weedy rice problem on their way. There is no proper method to solve thec problem. Collaboration among farmers and community should be initiated to find a logical solution.

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