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Issues and challenges of Clearfield® Paddy Production System among the paddy farmers in selected granary areas

(Isu dan cabaran Sistem Pengeluaran Padi Clearfield® dalam kalangan petani padi di kawasan jelapang padi terpilih)

Rosnani Harun*, Asruldin Ahmad Sobri*, Fatihah Husna Sufian* and Nurul Huda Sulaiman*

Keywords: Clearfield® Paddy Production System, weedy rice problems, issue and challenges

Abstract

The Clearfield® Paddy Production System was launched in 2010 in view of the weedy rice problems which occurred in almost 10% of paddy fields in Malaysia. Declining yields is significantly linked to weedy rice problem in the Malaysian paddy and rice subsector, which subsequently affects the farmer's income. This problem has led to the introduction of the Clearfield® Paddy Production System in 2010 to mitigate the weedy rice problem in the paddy fields which practices direct seeding method. However, the effect of continues using the system on the paddy cultivation and the farmers create another and serious probles. This study, therefore aims to investigate the issues and challenges of Clearfield® Paddy Production System among the paddy farmers in selected granary areas. A set of structured questionnaires were distributed to 241 respondents in four granary areas based on the stratified and random sampling techniques. Our findings revealed that 45% of respondents have been cultivating the Clearfield® Paddy Production System for seven consecutive seasons since its introduction across Peninsular Malaysia. In addition, farmers adopt various methods to minimize their production costs. The result of factor analysis indicated that, the main issue and challenges in the Clearfield® Production System are weedy rice recurs and become resistant to On Duty™. Besides that, the price of the package is expensive and increase the farmers production cost. The issues related to increasing in weeds, pest and diseases are so important. Thus, a continuous monitoring mechanism is highly crucial to prevent other problems which will affect the country's rice production in the long run. The Clearfield® Paddy Production System equally deserves serious attentios from various stakeholders e.g. government agencies and private firms.

Introduction

Rice is the staple food that has received special attention by the Malaysian government. Malaysia self-sufficiency level for rice still remains not much different at 70%n five years back. The total of the planted area for paddy was around 688,770 ha in 2016 not enough to produced rice for Malaysian people. Moreover, weedy rice infestation had been a major problem in Malaysia rice production after the shifting from transplanting to direct-seeding method (Dilipkumar et al. 2018) makes it become worst. To solve these problems in

*Economic and Social Science Research Centre MARDI Headquarters, Persiaran MARDI-UPM, 43400 Serdang Selangor.
E-mel: rosnanih@mardi.gov.my

the country rice industry technology and innovationtis important as a part of an effort to increase rice productivity.

The Clearfield® Paddy Production System was launched in 2010 in view of the weedy rice problems, e.g. recurrence of weedy rice, increased weedy rice, and weeds which occurred in almost 10% of paddy fields in Malaysia. The system was first adopted by the farmers across peninsular Malaysia in 2011 by using the MR220CL1 varieties. Then, the use of the Clearfield® Paddy Production System started gaining popularity among the farmers throughout peninsular Malaysia. The yield of the Clearfield Paddy Production System was 28% higher than and double compared to others inbred varieties (Rosnani et al. 2013; Sudianto et al., 2013). Statistics from Department of Agriculture shows that Malaysia rice production was increasing from 2011 from 2.57 million metric tons to 2.85 million tons in 2014. *Figure 1* shows the system was increasing adopted by farmers across Peninsular Malaysia. The percentage of the Clearfield® paddy planting area had increased from 0.9% in 2011 to 56% in 2015 across Peninsular Malaysia.

The Clearfield® Paddy Production System was initiated by the paddy farmers in Kedah using MR220CL1 variety covering 3,458 ha paddy field in the MADA granary area in 2011. *Table1* and *Table 2* shows the planting area of Clearfield® cultivars by state and granary areas in Peninsular Malaysia. From the table below, shows that MR220CL2 is the most widely planted cultivar in Malaysia because it is shorter and matures earlier than MR220CL1 (Dhilipkumar et al. 2018).

The production system was introduced in a set of packages along with the Standard Operating Procedures (SOP). The popularity of Clearfield® rice among farmers does not always produce positive impacts. Application of this technology without long-term planning, appropriate stewardship, institutional collaboration and oversight could have adverse ecological impact in terms of gene escape to weedy wild relatives (Sudianto et al. 2013). Nevertheless, various problems related to the management and practices of the Clearfield® Paddy Production System by farmers began to emerge after almost seven planting seasons. Despite of these problems, the rice

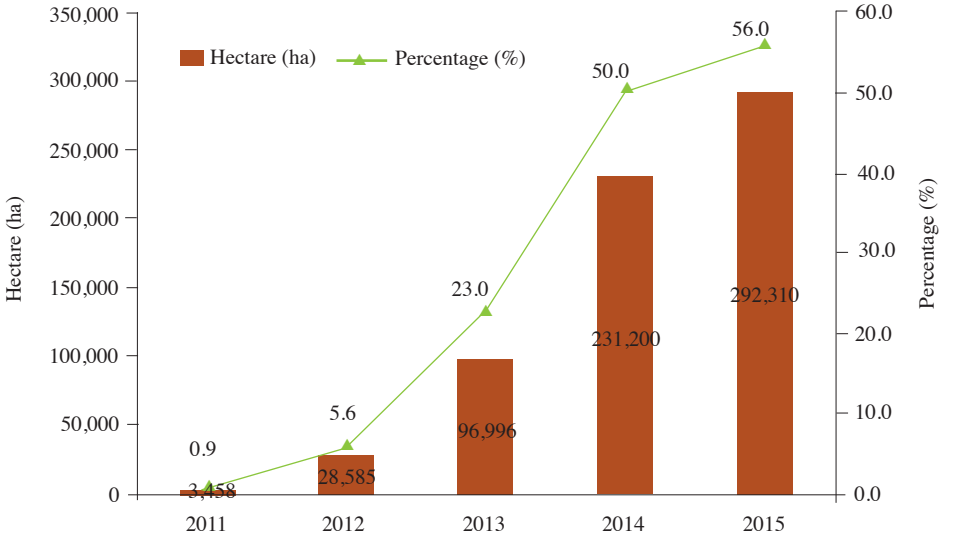

Figure 1. Percentage and hectare of Clearfield® planted across peninsular Malaysia adopted from 2011 – 2015

Table 1. Area planted (ha) with Clearfield® varieties by state adopted from 2011 – 2015

States	2011	2012		2013		2014		2015	
	CL 1	CL 1	CL 2	CL 1	CL 2	CL 1	CL 2	CL 1	CL 2
Johor	–	125	316	125	1,366	250	1,440	310	682
Kedah	3,458	283	6,316	108	58,818	1,681	105,845	114	106,677
Kelantan	–	35	–	25	424	133	7,023	–	23,525
Melaka	–	50	–	1,113	–	520	1,677	–	1,569
Negeri Sembilan	–	–	–	–	–	26	483	–	525
Pahang	–	734	568	–	3,313	–	2,701	–	2,227
Perak	–	11,183	–	–	2,040	–	23,191	8,300	55,608
Perlis	–	2,356	–	–	18,431	–	46,408	–	46,501
Pulau Pinang	–	–	–	815	780	1,363	4,376	3,224	6,218
Selangor	–	1,406	4,923	–	9,638	–	33,092	–	33,437
Terengganu	–	–	290	–	–	545	446	71	3,322
Peninsular Malaysia	3,454	16,172	12,413	2,186	94,810	4,518	226,682	12,019	280,291

Source: Malaysia's Paddy Statistics 2011 – 2015, DOA.

Table 2. Area planted (ha) with Clearfield® varieties by Granary Area adopted from 2011 – 2015.

Granary area	2011	2012		2013		2014		2015	
	CL 1	CL 1	CL 2	CL 1	CL 2	CL 1	CL 2	CL 1	CL 2
MADA	3,458	2,356	6,033	–	72,782	–	133,128	–	134,294
KADA	–	–	–	–	–	–	4,655	–	16,893
IADA KERIAN	–	3,000	–	–	–	–	–	8,300	30,500
IADA BLS	–	1,406	4,923	–	9,638	–	33,092	–	33,437
IADA Pulau Pinang	–	–	–	–	–	1,363	4,376	3,224	6,218
IADA Seberang Perak	–	5,785	–	–	2,040	–	20,903	–	18,200
IADA KETARA	–	–	290	304	384	595	496	240	2,478
IADA Kemasin Semerak	–	35	–	–	163	–	660	–	1,644
IADA Pekan						–	200	–	733
IADA Rompin						–	2,375	–	1,341
Jumlah	3,458	12,582	11,246	304	85,007	1,958	199,885	11,764	245,738

Source: Malaysia's Paddy Statistics 2011 – 2015, DOA

production shows the decreasing trend began in 2015 at 2.74 million metric ton by 2016. Clearfield® technology has a challenge to sustain the high yield advantage due to high risk in the evolution in HR weedy rice populations (Sudianto et al. 2013). Malaysia rice has been cultivated in double cropping per year, so that, the risk of out crossing with weedy rice are expected to be several times higher than what was observed in the North America or in regions where diversified cropping systems are practiced. Likewise, the planting of Clearfield® rice and weedy rice side by side can have a negative impact on rice production in future due to the probability of hybridization

(Engku et al. 2016). Continuation of ignorance can cause a major problem in the future if this problem is not controlled. If the planting of Clearfield® rice is continued for years after years, undoubtedly it can be said that resistance to imidazolinone will increase in weedy rice. Suffice to say that Clearfield® rice is not recommended to be planted for long term, but as a short-term control for weedy rice before reverting back to commonly cultivate rice.

Terano et al. (2016) used Factor analysis to determine factors and issues regarding the adoption of the Clearfield Production System by the farmers in Malaysia. The four factors were identified has influenced the paddy farmers are effectively controlling of weeds, increase yield, government initiative and farmers' knowledge. This is indicated that, when all these factors could benefit them, so the farmers will tend to have a positive opinion about the effectiveness of the Clearfield® Paddy Production System.

Farmers have passion adopted the Clearfield® rice cultivars to efficiently control weedy rice, but have not been so diligent in following the guidelines provided by the company. Without a proper management based on frequent crop rotation, utilization of certified seeds and strict control of weedy rice escapes, this new technology appears not to be sustainable (Scarabel, et al, 2012). The first case of weedy rice that was cross-resistant to imazapic and imazapyar in the Malaysia Clearfield® rice field (Dilipkumar et al. 2018). Lack of adherence to stewardship guidelines is the most likely explanation for this situation. So that, to maintain the viability of the technology, it is essential to follow the three basic principles stated in the stewardship guidelines, namely (1) planting Clearfield rice for not more than two consecutive seasons, (2) using certified seed, and (3) spraying the registered imidazolinone herbicide at the specific rate plus correct timing.

Recently, not much literature review has been discuss about the issues and challenges related to the Clearfield® Paddy Production System. A few past studies have discussed about the impact of continuous application the system could create another problem in rice cultivation. Farmers must follow the SOP that provided, otherwise they will be facing problems and risk in reducing their paddy yield. In Malaysia, there is no research that has been conducted to find out what the problems and issues from farmers of view in the cultivation of paddy Clearfield. So that, this study aims to investigate issues and challenges of the Clearfield® Paddy Production System among the paddy farmers in the selected granary areas across Peninsular Malaysia.

Methodology

This study was conducted in four granary areas – KADA, BLS, IADA Kerian and IADA Seberang Perak. The areas were selected according to the earliest area that farmers adopted Clearfield® Paddy Production System, namely PBLS and also based on zone. IADA Kerian and IADP Seberang Perak are in North, PBLS for West and KADA in East coast zone. The stratified and random sampling technique was employed based on the list of farmers who adopt the Clearfield® Paddy Production System. A set of structured questionnaires were distributed to 241 respondents in four granary areas based on the stratified and random sampling techniques. A set of structured questionnaires was distributed to the respondents by the enumerators. The responses collected from the respondents include the farmer's demography, paddy field characteristics, background of the use of the Clearfield® Paddy Production System, production costs, yield, and farmers' perceptions towards the Clearfield® Paddy Production System. Descriptive statistical analysis was performed to obtain frequency and percentage. The collected data was computed and analysed by using IBM-SPSS version 17.0.

Factor analysis

Factor analysis (FA) was conducted to identify the issues and challenges of the Clearfield® Paddy Production System. The respondents were asked about the problems that they faced along using the Clearfield® Paddy Production System. The items were measured based on the Likert's Scale ranging from 1 (strongly disagree) and 5 (strongly agree).

The score obtained was analysed by using the FA to identify the implied factors that was formed from the combination of several variables (problems) which had been answered by the respondents. The correlation between some variables was analyzed and the variables were consolidated and represented by several important factors. The same factors can be described in the form of a combination of the linear variables set as follows:

$$F_i = Bi_1X_1 + Bi_2X_2 + ... + Bi_kX_k$$

Where:

F_i = Estimate factor i^{th}
B = Coefficient score factor
X_1 = Standardised variable
k = Number of variables

The first factor describes the largest portion of the variance, the second factor describes the rest of the variables (required not to be related to the first factor) and subsequent selections will be using the same procedure. Prior to executing the AF, the KMO (The Kaiser-Meyer-Olkin) and Bartlett's tests are conducted to determine suitability of the AF. If KMO and Bartlett's values exceed 0.6, the collected data is suitable for the AF. Results of AF that have eigen values greater than 1.0 are taken as the factors that represent the issues and challenges of the Clearfield® Paddy Production System. These factors are measured or categorized using the standard coefficient ratio (aim) as follows in *Table 3* below.

Results and discussions

Profile of the respondents

A total of 241 respondents were interviewed. The majority of respondents were male. Most of the respondents were Malay (94%), followed by Chinese (6%). Almost half of the respondents completed the Secondary School (SPM) level, whereas 4.5% of the respondents graduated from higher learning institutions. Most respondents (62%) were aged between 41 years to 60 years with the mean age of 49 years old. The majority of respondents (94%) were full-time paddy farmers. Besides, 48% of respondents have experience of less than 16 years in paddy farming. *Table 4* summarizes the background of the respondents in this study.

Farmer's characteristics

The average area planted is 4.9 ha with the majority of the respondents (39%) holding land size in the range between one hectare and three hectares (*Table 5*). Almost half of the respondents run their paddy farms on tenancy basis. Meanwhile, there were 29% of respondents as owners and tenants. The majority of respondents (97%) were individual farmers while the rest were grouped farmers. Almost all respondents in KADA were tenant (86%), followed by respondents in IADA Seberang Perak (52%). The majority of respondents in the IADA BLS (38%) were the owners of the paddy fields while 36% of respondents in IADA Kerian were both owners and tenants of the paddy fields.

Table 3. Standard coefficient ratio (aim)

Range	Correlation
aim <0.5	Not significant
0.5 <aim <0.69	Moderate
0.7 <aim <0.79	High
aim ≥0.8	Very significant

Table 4. Profile of the respondents

Demographic variables	Frequency	%
Gender		
Male	233	96.7
Female	8	3.3
Total	241	100.0
Race		
Chinese	15	6.2
Malay	226	93.8
Total	241	100.0
Educational level		
Primary school	59	24.5
Secondary school (SRP/ PMR)	60	24.9
Secondary school (SPM)	111	46.1
Diploma/STPM	9	3.7
University/College/ Institute	2	0.8
Total	241	100.0
Age group (years old)		
< 30	9	3.9
31 – 40	49	21.4
41 – 50	67	29.3
51 – 60	74	32.3
> 60	30	13.1
Total	229	100.0
Primary occupation		
Paddy farmer	226	93.8
Business	3	1.2
Government sector	8	3.3
Private sector	1	0.4
Others	3	1.2
Total	241	100.0
Farming Experience (years)		
< 16	115	47.7
16 – 30	87	36.1
31 – 45	28	11.6
> 45	8	3.3
Total	229	100.0

Source: Field survey (2015)

Table 5. Characteristics of paddy field

Characteristics	Frequency	Percentage (%)
Hectare		
<1 ha	20	8.3
1.1 – 3 ha	93	38.6
3.1 – 5 ha	57	23.7
>5 ha	66	27.4
Total	236	100
Land status		
Ownership	46	19.1
Ownership and tenancy	69	28.6
Tenancy	118	48.9
Sharing	6	2.5
Total	239	100

Source: Field survey (2015)

Farmers practices of the Clearfield® Paddy Production System

The results showed that the Clearfield® varieties have been used by the paddy farmers for almost seven planting seasons. *Figure 2* shows the percentage of farmers who planted Clearfield® varieties according to the number of planting season. Based on the figure, 45% of the respondents planted the Clearfield® varieties for seven consecutive seasons.

Table 6 shows the varieties that have been used by the respondents during the planting seasons. The Clearfield® Paddy Production System was introduced with the MR220CL1 variety in Season 1 (2/2011) until the 3rdSeason of 2/2012. After that, farmers began planting MR220CL2 variety in Season 3 (2/2012) until today. The use of the Clearfield® Paddy Production System among the farmers had increased to 62% in Season 2/2014 from 36% in Season 2/2011.

Issues and challenges of the Clearfield® Paddy Production System

Table 7 below shows some issues and challenges faced by the respondents in adopting the Clearfield® Paddy Production System. On average, the respondents

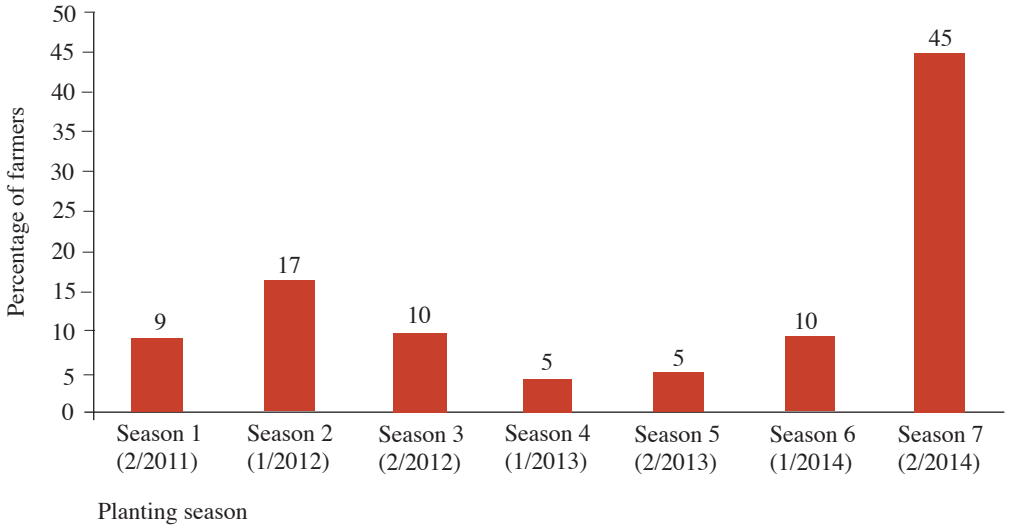

Figure 2. Percentage of farmers using the Clearfield® varieties based on the planting seasons
Source: Field survey (2015)

Table 6. Types of Clearfield® varieties used by the farmers according to seasons

Season	Varieties	Frequency	%
Season 1	MR 220 CL1	53	36.1
Season 2	MR 220 CL1	57	37.7
Season 3	MR 220 CL1 and MR 220 CL2	63	40.9
Season 4	MR 220 CL2	70	46.1
Season 5	MR 220 CL2	100	58.1
Season 6	MR 220 CL2	137	66.8
Season 7	MR 220 CL2	123	61.8

Source: Field survey (2015)

showed a tendency towards agreement that expensive Clearfield® Paddy Production System package (mean = 4.3000, SD = 0.97328) and OnDuty™ (mean = 4.2458, SD = 0.9053) were major issues, followed by higher cost of production (mean=4.0917, SD=0.78688) and lack of capital (mean=3.6147, SD=1.06912). The respondents also noted that the OnDuty™ have become ineffective to the weedy rice problem (e.g. recurrence of weedy rice and increased weeds), paddy diseases, and pest problems. Moreover, they believed that their yields would decrease and the inbred varieties would be stunted if the Clearfield® varieties are planted continuously. However, only a small number of respondents have problems in getting certified Clearfield® varieties from the licensed seed distributors.

In addition, Factor Analysis (AF) was also performed to support the results of the descriptive statistics in identifying the issues and challenges faced by the farmers who cultivate the Clearfield® varieties. Prior to executing the AF, the KMO and Bartlett's and Goodness-of-fit tests were performed. KMO and Bartlett's and Goodness-of-fit test results are shown in *Table 8* and *Table 9*.

The KMO test is capable of displaying and testing relationships among free variables or information lacking; 'Multicollinearity'. The factor analysis is

Table 7. Issues and challenges of the Clearfield® Paddy Production System

Issues and challenges	N	Mean	SD	Min	Max
The package price of the Clearfield® Paddy Production System is expensive	240	4.3000	.97328	1.00	5.00
Price of OnDuty™ is expensive	240	4.2458	.99053	1.00	5.00
Production costs increase	240	4.0917	.78688	1.00	5.00
Lack of capital	240	3.6417	1.06912	1.00	5.00
The weedy rice is resistant to the OnDuty™ if the Clearfield® varieties are planted continuously	239	3.6402	1.07503	1.00	5.00
Increased weed problems	239	3.2510	1.20388	1.00	5.00
Weedy rice problem recurs	240	3.2417	1.22728	1.00	5.00
Lack of information on the Clearfield® Paddy Production System	237	3.1435	1.25739	1.00	5.00
Yield decreases if planted continuously	239	3.1255	1.09282	1.00	5.00
Disease problems increase	239	2.9874	1.05113	1.00	5.00
Pest problems increase	238	2.9328	1.02072	1.00	5.00
The growth of inbred varieties is stunted if they are re-planted	235	2.8170	1.09998	1.00	5.00
Problems in getting certified Clearfield® variety seeds from the licensed seed distributors	240	1.8375	.98240	1.00	5.00

Note: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree.

Table 8. KMO dan Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.727
Bartlett's Test of Sphericity	Approx. Chi-Square	1394.120
	df	78
	Sig.	.000

Table 9. Goodness-of-fit test

Chi-Square	df	Sig.
79.996	32	.000

appropriate if the value of KMO >0.50. In this case, KMO result indicated that our survey data did not suffer from the serious multicollinearity problem (KMO = 0.727). The Bartlett's test is used to identify whether the correlation between items is sufficient to do a factor analysis. The Bartlett's test of sphericity results ($\chi^2 = 1394.12$, $df = 78$, $p = .000$) showed that the correlation between items is sufficient to do the factor analysis. In addition, the Goodness-of-fit test also showed a significant χ^2 of 79.996. In short, factor analysis is appropriate in describing the problems faced by the respondents in using the Clearfield® Paddy Production System.

Table 10 shows four major factor components that have been extracted through varimax rotation. The four components of this factor indicated the cumulative ratio of 66.6% variance in the study, which exceeds the set value (> 60%). The overall Eigen value also exceeds the set rate (>1) with a value of 8.66. The variance ratio is an indicator to determine the strength of the effect of each component of the factor or the category of the problem. The results showed that weedy rice and production costs (31.74%) have the strongest influence on the issues and challenges of the Clearfield® Paddy Production System, followed by expensive Clearfield® Paddy Production

Table 10. Factor analysis on issues and challenges of the Clearfield® Paddy Production System

Issues and challenges	Factor			
	1	2	3	4
Weedy rice and production costs				
Weedy rice problem recurs	.847			
Increased weed problem	.775			
The weedy rice is resistant to the OnDuty™ if the Clearfield® varieties are planted continuously	.608			
Production costs increase	.464			
Clearfield® Paddy Production System package price				
The package price of the Clearfield® Paddy Production System is expensive		.934		
Price of the OnDuty™ is expensive		.911		
Pests and diseases				
Pest problem increases			.889	
Disease problem increases			.766	
Growth and information				
The growth of inbred varieties is stunted if they are re-planted				.655
Lack of information on the Clearfield® Paddy Production System				.449
Yield decreases if the Clearfield® varieties are planted continuously				.385
Eigen values	4.127	1.985	1.383	1.165
Variance ratio (%)	31.743	15.271	10.642	8.959
Cumulative variance ratio (%)	31.743	47.014	57.655	66.615

System package (15.27%), pests and diseases (10.64%), growth and information on the Clearfield® Paddy Production System (8.95%).

The items were categorised into four components *viz*. weedy rice and production costs, Clearfield® Paddy Production System package price, pests and diseases, and growth and information. All the items in the four components showed strong correlations of more than 0.60, except for three items i.e. increased production cost (0.464), lack of information on the Clearfield® Paddy Production System (0.449), and decreased yield if the Clearfield® varieties are continuously planted (0.385).

Weedy rice and production costs

The factor analysis results showed that the recurrence of weedy rice has the strongest significant correlation (0.847), followed by increased weed rice problem (0.775), the weedy rice is resistant towards the OnDuty™ application (0.608), and the production costs (0.464). These findings demonstrate additional efforts deemed necessary for improvement i.e. management and monitoring by various agencies in ensuring the effectiveness of the centralized management program.

Clearfield® Paddy Production System package price

The price of the Clearfield® Paddy Production System package is expensive and indicated the strongest significant correlation (0.934) of all items in this component. Similarly, expensive OnDuty™ also indicated a strong significant correlation (0.911). The results are consistent with the previous descriptive results which showed that these two issues are mostly perceived as important by the respondents. Therefore, the

stakeholder should take note of these issues so that the problem of procuring uncertified Clearfield® variety seeds and herbicides will not occur in the future.

Pests and diseases

Pest and disease problems increase with the use of the Clearfield® Paddy Production System with the correlations of 0.889 and 0.766, respectively. Contrary to the results of the above descriptive analysis, this problem is however not ascertained by the farmers. Nevertheless, the responsible stakeholders should think of the effective ways to tackle this problem so that it will not significantly affect the yields.

Growth and information

The stunted growth of inbred varieties due to replanting indicated the strongest significant correlation of 0.655. This situation should be treated more seriously by the responsible stakeholders to overcome this problem. This is important to address other more serious problems which will downgrade farmers' perceptions towards the Clearfield® Paddy Production System.

Conclusions and recommendations

Overall, the majority of farmers in selected granary areas have been used the Clearfield® Paddy Production System for seven consecutive seasons since it's introduced in Malaysia. The use of the Clearfield® paddy Production System continuously has created some issues and problems in farmers' fields. Factor analysis indicated that, the main issue and challenges in the Clearfield® Production System are weedy rice recurs and become resistant to On Duty™. Besides that, the price of the package is expensive and increase the farmers' production cost. The issues related to increasing in weeds, pest and diseases are so important. This problem needs to be properly addressed in order to convince farmers on following the recommended SOPs. Therefore, overcoming these issues and challenges requires a concerted effort among all sectors involved such as researchers, extension agent, private industry and government policy maker.

In order to ensure that the original goals of the introduction of the Clearfield® paddy Production System was to control weedy rice problems, there is a need for continuous monitoring for farmers to follow the set SOPs. This is to measure the problems that mention earlier does not will affect the country's rice production in the long run. This matter should be taken seriously by the parties concerned whether it is government or private, to ensure that the Clearfield® paddy Production System can continue to be utilized by farmers in paddy cultivation in Malaysia.

Based on the above conclusions, several recommendations to improve the effectiveness of the Clearfield® Paddy Production System are briefly delineated as follows:

Improve communication channels. Effective communication between the agency and the farmer should be established so that all information on the Clearfield® Paddy Production System is well communicated to the farmers.

Increase monitoring. The agency also needs to increase its monitoring in regards to the farmers' practices to ensure that all practices pertaining to the Clearfield® Paddy Production System are strictly observed by the farmers.

Reduce the price of the production system package. The price of the Clearfield® Paddy Production System package necessitates a review. Price reduction helps farmers minimize their production costs, thus, encourages more farmers to adopt the production system. In addition, it prevents the farmers from procuring illegal seeds from the unlicensed seed suppliers in view of the rising production costs.

Increase efficiency of the OnDuty™. Improvement or re-formulation of OnDuty™ is vital so as ensure the enhanced adaptation of the OnDuty™ against the weedy rice and weeds in the paddy fields, thereby improving the effectiveness of the Clearfield® Paddy Production System.

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Abstrak

Sistem Pengeluaran Padi Clearfield® telah dilancarkan pada tahun 2010 untuk mengatasi masalah padi angin yang berlaku hampir 10% daripada sawah padi di Malaysia. Penurunan hasil padi secara signifikan dikaitkan dengan masalah padi angin dalam sektor padi dan beras di Malaysia yang seterusnya mempengaruhi pendapatan petani. Masalah ini telah membawa kepada pengenalan Sistem Pengeluaran Padi Clearfield® untuk mengurangkan masalah padi angin di sawah yang mengamalkan kaedah tabur terus. Walau bagaimanapun, kesan berterusan penggunaan sistem ini oleh petani telah mewujudkan masalah lain yang serius. Oleh itu kajian ini bertujuan untuk mengkaji isu dan cabaran Sistem Pengeluaran Padi Clearfield® dalam kalangan petani padi di kawasan jelapang terpilih. Satu set soal selidik berstruktur telah diedarkan kepada 241 responden di empat kawasan jelapang berdasarkan teknik pensampelan berstrata dan rawak. Dapat kajian mendedahkan bahawa 45% responden telah menggunakan Sistem Pengeluaran Padi Clearfield® selama tujuh musim berturut-turut sejak diperkenalkan di seluruh Semenanjung Malaysia. Di samping itu, petani turut mengamalkan pelbagai kaedah yang tidak mematuhi SOP untuk meminimumkan kos pengeluaran mereka. Hasil analisis faktor menunjukkan bahawa masalah utama dan cabaran dalam Sistem Pengeluaran Clearfield® adalah masalah padi angin kembali dan menjadi tahan terhadap racun On DutyTM. Selain itu, harga pakej adalah mahal dan meningkatkan kos pengeluaran petani. Isu yang berkaitan dengan peningkatan rumpai, perosak dan penyakit juga penting. Oleh itu, mekanisme pengawasan berterusan sangat penting untuk mencegah masalah ini daripada berlaku yang akan menjejaskan pengeluaran beras negara dalam jangka panjang. Sistem Pengeluaran Padi Clearfield® juga patut mendapat perhatian yang serius dari pelbagai pihak berkepentingan contohnya agensi kerajaan dan firma swasta.