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RESEARCH ARTICLE

WEEDY RICE INFESTATION (*ORYZA SATIVA F. SPONTANEA L.*) IN TRIBAL AREAS OF MADHYA PRADESH

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ABSTRACT

Weedy rice infestation is a big problem in the rice growing areas. A survey was conducted in July 2016 to understand the knowledge and practices of rice farmers about weedy rice in two nagar panchayat of tribal areas of Shahdol district, Madhya Pradesh. The present study aimed to establish awareness of farmer's about weedy rice and observe the farmer's practices in the management of weedy rice. We didn't observe much difference between farmer's knowledge about weedy rice and their management in two villages. Results showed that majority of the farmers (70%) responded that awns can be absent in some weedy rice and about 58% of the farmers had no knowledge that weedy rice is a type of weed in rice field. Cutting the weedy rice panicles at the time of harvesting is the best way of reducing weedy rice, and it was practiced by about 60% farmers of the most affected villages. Our study suggests that there is a need to increase awareness about weedy rice among tribal farmers.

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INTRODUCTION

Rice is the main staple crop in India, including the Madhya Pradesh. In the Madhya Pradesh, rice farming is important in the Shahdol District, as rice is one of the major sources of income and food of the district. Based on the most recent national data, Madhya Pradesh produced 1103 kg/ha of rice (Rao, 2009). No wonder that this site has been known as one of the rice granaries of the Madhya Pradesh. In the past years, however, rice production in the province has been steadily and increasingly affected by an emerging farm problem: weedy rice. Most affected areas are those where direct seeding is commonly practiced. Weedy rice is a serious threat in direct-seeded rice systems as it competes with cultivated rice, decreases crop yield, and reduces market value of the harvested crop due to infestation (Rathore *et al.,* 2014, 2015; Tanzo *et al.,* 2013). The rice farmers are suffering from severe weedy rice infestation. To develop a truly successful strategy to battle with weedy rice, there is a need to involve awareness of farmers. It is essential to understand how the farmers are suffering by weedy rice infestation and what they know about its critical planning and implementing campaign programs.

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This is essential knowledge so that researchers will be able to identify the knowledge gaps and behavioral patterns of farmers towards weedy rice and even learn from their management practices (Chauhan *et al,* 2010, 2014; Rathore *et al,* 2013). Such knowledge will facilitate learning and prioritize actions for the development of a successful strategy against weedy rice. This study deals with the knowledge and practices of rice farmers about weedy rice. The objectives of the present study were to give information about weedy rice to the farmers and examine farmer's practices in managing weedy rice.

MATERIALS AND METHODS

This survey was conducted in July 2016 in two nagar panchayat of tribal areas in Shahdol district of Madhya Pradesh namely, Beohari and Jaisingh nagar based on visual inspection and interviews with key informants in the area. Two villages were purposely selected for each nagar Panchayat: First most affected village of Beohari was Budwa (24°13'54.55"N 81°25'31.83E) and the second most affected village was Kuhiya (24°12'22.43"N 81°23'27.21E). In Jaisingh nagar, the first most affected village was Amjhor (23°55'3.36"N 81°46'27.29E) and the second most affected village was Haiki (23°54'56.20"N 81°23'45.58E). In the first most affected village, 20 farmers were randomly selected from each nagar panchayat. In the second most effected villages, 10 farmers

were randomly selected from each nagar panchayat. Thus, a total of 60 rice farmers were interviewed: 40 farmers were from each of first villages and 20 rice farmers from the second most affected villages. A survey questionnaire was developed, translated in the local language, and pretested. The study focused on the knowledge and practices of rice farmers on weedy rice. Knowledge on weedy rice was captured by asking the farmers if a knowledge statement presented to them was either true, false, or they do not know. The statements focused on two important subject areas of weedy rice namely, its attributes (8 statements) and management options (7 statements). Rice farmer's practices were captured using close and open discussions which established if the knowledge of rice farmers translates to action. In addition, capturing the practices of the rice farmers informed us what information to be improved, which study may wish to confirm through experiments, and what we can learn from the farmers. Basic social and farm characteristics of the farmers were also gathered. Local enumerators were trained which facilitated the survey interview and mitigated errors. Unceremoniously interviews with key informants and focus group discussions were also done to acquire additional information which supplemented the survey data. Descriptive statistics such as frequency and ranking were used in the analysis of the data.

A

B

C

Fig. 1. Survey of weedy rice infestation in rice fields

RESULTS AND DISCUSSION

Farmers farm and Socio Characteristics

On the average, regardless of area, the youngest farmer was 24 years old and the oldest was 70 years old. There was a majority of male respondent (66%) as compared to female (34%). The respondents had the highest educational qualification higher secondary and the lowest qualification primary. It was found that respondents were generally dependent on rain (37%) and the canal irrigation system (50%) for their irrigation, and have opted direct seeding (62%) of rice (Table 1). The respondents from the first most affected village were dependent on farmer/exchange seeds (58%) while more than half (42%) of the farmers from the second most effected village used certified seeds, followed by farmer/exchange seeds (50%).

Knowledge of the Attributes of weedy Rice

There were 8 statements about weedy rice characteristics presented to the farmer's respondents which described the attributes of weedy rice. Among the 8 statements, majority of the farmers from the first most affected village considered six statements to be true (Table 2). These statements were:-

(1) Weedy rice has taller than cultivated rice (65% farmers).
(2) It is possible to eat weedy rice (100%).
(3) Seeds shattering of weedy rice, easily (72%).
(4) Weedy rice seeds left on the soil surface at harvest can easily germinate (78%).
(5) Weedy rice is more common in direct seeding (62%).
(6) Longevity of weedy rice seeds in soil may last more than one cropping season (68%).

These responses are similar with the results reported in recent research (Suh *et al,* 2008; Tanzo *et al,* 2013). Two statements were perceived by majority of the farmers from the first most affected village to be false: (1) awns can be absent in some weedy rice (30%) (2) Weedy rice is a type of weed in rice (42%). For the second most affected village the same six statements as that of the first most affected village were deemed to be true by majority of the respondents.

In addition, the statement that "weedy rice is a type of weed in rice" was found true by 65% and awns has absent in some weedy rice 45% of these respondents. Based on the survey results, it is possible that first most affected village may have the nasty infestation of weedy rice in the province due to the incorrect knowledge of two major weedy rice characteristics: "awns are absent in some weedy rice" and "weedy rice is a type of weed in rice". They will not be very persistent in controlling weedy rice. Such an incorrect knowledge may contribute to the poor management of weedy rice and in effect, increase the infestation of weedy rice in the first most affected villages.

Knowledge of the Management of Weedy Rice

The respondents were asked about their knowledge on the management of weedy rice. Seven statements were on the management practices for weedy rice (Table 3). For both villages, the same trend was observed. First, five statements were known by the majority from both villages management practices for weedy rice. These statements were: -

Fig. 2. Geographical map of visited area in Madhya Pradesh

Table 1. Farmers farm and Socio characteristics of rice farmer respondents (N = 60)

Socio-demographic characteristic	First most affected village (40)	Second most affected village (20)	Average
Age (in year)			
Youngest Age	23	25	24
Oldest Age	71	69	70
Sex (%)			
Female	32%	36%	34%
Male	68%	64%	66%
Education ability (yr)			
Highest	Higher Secondary	Higher Secondary	Higher Sec
Lowest	Primary	primary	Primary
Source of irrigation (%)			
Canal	68%	32%	50%
Pond/Well /Tube wells	2%	24%	13%
Rain	36%	38%	37%
Crop establishment (%)			
Transplanting	44%	32%	38%
Direct seeding	56%	68%	62%
Seed class of variety planted			
Farmer/exchange	66%	50%	58%
Registered	2%	6%	4%
Certified	22%	42%	32%
Hybrid	8%	4%	6%
Average size of land in the most affected weedy rice (in hectares)	1.2	1.5	1.35

Table 2. Knowledge of the attributes of weedy rice (N = 60)

Attributes of weedy rice	% FMA village (40)			% SMA village (20)		
	True	False	Not Sure	True	False	Not Sure
Weed rice has taller than cultivated rice	65	35	-	70	30	-
Seeds shattering of weed rice, easily	72	18	10	75	20	5
Weed rice is more common in direct-seeding	62	38	-	66	34	-
Longevity of weed rice seeds in soil may last more than one cropping season.	68	28	4	72	18	10
It is possible to eat weedy rice	100	-	-	95	5	-
Weedy rice seeds left on the soil surface at harvest can easily germinate	78	15	7	82	12	6
Weedy rice is a type of weed in rice	42	58	-	65	35	-
Awns are absent in some weedy rice	30	70	-	45	55	-

*FMA: - first most affected, SMA: - second most affected

Table 3. Proper management of weedy rice (N = 60)

Management of weedy rice	% FMA village (40)			% SMA village (20)		
	True	False	Not Sure	True	False	Not Sure
Cutting the panicles at harvest	60	34	6	68	20	12
Effect of Seed exchanged with farmers	65	25	5	68	22	10
Repeated plowing during fallow period	62	28	10	66	16	18
Thoroughly cleaning by farm machinery (tractor or thresher)	58	38	4	64	36	-
Clearing of field or irrigation canals	67	33	-	76	24	-
Effect of Early flooding	45	50	5	54	46	-
Rotary weeding/cultivation can reduce weedy rice	37	44	19	36	42	22

*FMA: - first most affected, SMA: - second most affected

(1) The best way to reduce weedy rice is by cutting the panicles at harvest.
(2) Weedy rice problem will increase if seeds are exchanged with other rice farmers;
(3) Repeated plowing during fallow period can reduce weedy rice.
(4) Thoroughly cleaning by farm machinery (tractor or thresher) will help limit-weedy rice infestation.
(5) Field or irrigation canals should be cleared of weedy rice to limit infestation. The second trend was that more than one third of the respondents from both villages thought two statements were incorrect. These statements were
(6) Early flooding has no effect on weedy rice infestation and (7) Rotary weeding/cultivation can reduce weedy rice infestation. Flooding is considered an important component of cultural weed management in rice. However, the introduction of early flooding rather than a later flooding suppresses weeds more effectively. Many weedy rice seeds decay between long periods of flooding condition (Abraham et al., 2010).

In research studies in Italy, maximum emergence of weedy rice was from 0-5 cm and then it declined with increases in depth and ceased at 10 cm (Ferroro and Vidotto, 2011). Though almost all farmers from both villages acknowledged that seed exchange worsens weedy rice problem, this fact had not hindered the practice in these areas. Based on the results of Table 1, 66% of the farmers from the first most affected village and 50% of the farmers from the second most effected village practiced seed exchange for the major variety they had planted in 2015. This practice may also be the reason why the first most affected village was the worst infested by weedy rice. When asked during the focus group discussions, the farmers from first most effected village reasoned that they kept on planting farmer's seeds because certified seeds are expensive. On the other hand, the second most affected village may not be as badly infested by weedy rice because more than half of the respondents used certified seeds in 2015. It should also be noted that the other management practices that the majority of the respondents from both villages knew as correct repeated plowing during fallow period can reduce weedy rice, thoroughly cleaning by farm machinery will help to limit weedy rice infestation, field or irrigation canals should be cleared of weedy rice to limit infestation is recommended. For these two sets of farmers, it does not mean that knowledge equates to practice.

Conclusion

Weedy rice is increasingly become a pest in direct seeded rice system of tribal areas in Shahdol, Madhya Pradesh. This poses a severe threat to rice production because it reduces rice yields. This study has shown that farmers could identify of weedy rice and also use strategies to eradicate them, based on their farming experience. Farmer's knowledge of weedy rice did not differ much between two villages. Both had almost the same trends as about their knowledge true and false. The only significant difference was that farmers from the second most affected villages knew that weedy rice is a weed in rice which may possibly contributes as compare to the first most affected village (another factor may be the use of certified seeds by the farmers from second most effected villages). It is suggested that farmer awareness training should be conducted in these villages, and we should focus more on weedy rice, especially on the critical attributes of this weed. Weedy rice infestation in rice fields of both villages in tribal areas under Shahdol district of Madhya Pradesh are well explored in the survey and the most of the extension training programme is needed to aware the farmer of weedy rice in the near future.

REFERENCES

Chauhan, B. S. and Johnson, D. E. 2010. Weedy Rice (*Oryza sativa* L.) Grain Characteristics and Growth Response to Competition of Weedy Rice Variants from Five Asian Countries, *Weed Science*, (58) 4: 374- 380.

Chauhan, B. S., Abeysekara, A. S. K., Wickramarathe, M. S. Kalatunga, S. D. and Wickrame, U. B. 2014. Effect of Rice Establishment Methods on Weedy Rice (*Oryza sativa* L.) Infestation and Grain Yield of Cultivated Rice (*Oryza sativa* L.) in Sri Lanka, *Crop Protection*, 55:42-49.

Ferrero, A. and Vidotto, F. 2011. Germination of weedy rice in response to field conditions during winter. *Weed Technol*., 25: 252-261.

Rao, S. K. 2009. Status Paper on Rice in Madhya Pradesh. Rice Knowledge Management Portal (RKMP) Directorate of Rice Research, Rajendranagar, Hyderabad. http://www. rkmp.co.in 1-24.

Rathore, M., Singh, R. and Kumar, B. 2013. Weedy rice: an emerging threat to rice cultivation and options for its management. *Current Science,* 105: 1067-1072.

Rathore, M., Singh, R., Kumar, B. and Chauhan, B.S. 2015. Weedy rice - the Indian scenario. In 25th Asian-Pacific Weed Science Society Conference on "Weed Science for Sustainable Agriculture, Environment and Biodiversity" Hyderabad, India. p: 7.

Rathore, M., Singh, R., Kumar, B. and Ghosh, D. 2014. Germination of weedy rice under anaerobic conditions. In Biennial Conference of Indian Society of Weed Science on "Emerging Challenges in Weed Management" Directorate of Weed Science Research, Jabalpur M.P. India. p:17.

Suh, H. S. 2008. Weedy Rice National Institute of Crop Science, Rural Development Administration (RDA), Suwon, pp-240.

Tanzo, I. R., Martin, E. C. and Chauhan, B. S. 2013. Weedy Rice (*Oryza sativa* L.) Problem in Rice (*Oryza sativa* L.) Based Cropping Systems in the Philippines. *American Journal of Plant Sciences*, 4: 2359-2366.

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