

SHORT NOTE

The effect of dissemination of agricultural information about pesticides hazards on farmer's knowledge, attitudes and practices (a case study: Rahad Scheme, Sudan)

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The word pesticide is composed of two words; pest, which means any organism that causes direct or indirect damage to agricultural crops and public health; and cide which means killing. There are many types of pesticides for different pests· e.g., insecticides, herbicides, bactericides, rodenticides, molluscides *etc.* They are chemicals which control pests that negatively affect agricultural production. Pesticides, when first discovered, were found to be quick, effective and direct, but some bad effects were noticed after a few years of application (Edward, 1973; Abdalla, 1983; Elbadri, 2003). The organochlorines, for instance, were found to be more persistent in the environment, and pests could develop resistance to them. Pesticides are used in Sudan to spray crops against pests; they are mainly used in irrigated schemes such as Gezira and Rahad.

In the Rahad Scheme, all sorts of pesticides such as insecticides, herbicides, rodenticides and fungicides are used to control pests (Department of Plant Protection, Rahad scheme, 1995).

Pesticides are sprayed annually in the Rahad Scheme with the obvious objective of controlling pests. However, they were found to have other negative effects such as killing non-targeted organisms like beneficial insects, birds, domestic animals and fishes in irrigation canals, in addition to human poisoning by contact with pesticides or from sprayed vegetables. It was also proved that detectable amounts of pesticides residues were found in irrigation canals, water, vegetables, soil and milk.

Communication and dissemination of useful information is essential for farmer's awareness (Rogers, 2003). Also, the provision of information is very important for appropriate policy and program formulation (Swanson, 1984). The objective of this study was to evaluate the farmer's knowledge, attitudes and practices about pesticides hazards and application methods.

This study was conducted in the northern group of the Rahad Scheme (blocks 7, 8 and 9). The random sampling technique was used. Accordingly, a sample of 120 farmers was randomly selected from a total of 5132 farmers in the northern group of Rahad Scheme. A questionnaire consisting of 27 questions was developed and personal interview technique was used to implement the questionnaire. The collected data were statistically analyzed and interpreted using the statistical package for social sciences (SPSS), descriptive analysis (tables, frequencies and percentage) and Chi-square test were used to identify the association between the variables.

Training and wearing protective clothes

The farmers were asked about whether they were subjected to any training or given instructions in pesticides application methods and were asked about wearing protective clothes. Their answers are shown in Table 1. The results showed that 73.3% of respondents did not have any training or instruction

in pesticides application. The majority of respondents (73.3%) mentioned that they did not wear protective clothes when applying pesticides. When they were asked about the reasons for not wearing protective clothes, the non-availability of protective clothes came as the first problem for not wearing them.

Methods of dissemination of information

The farmers were asked about their methods of information and their answers were shown in Table 2. The results showed that television, radio and agricultural agents represent only 2.5%, 8.3% and 21.8% as methods of information, respectively. On the other hand, the majority of farmers (66.6%) used either colleagues, neighbors or salesmen as sources of information about pesticides (non-official sources).

Sources of pesticides

The farmers were asked about the sources of pesticides and their answers are shown in Table 3. The results showed that 83.3% of the respondents obtained their pesticides from the local market and other places such as neighbors, friends *etc.*, which were unauthorized sources.

Safety period

Farmers were asked about considering the time between pesticides application and harvesting the treated crops and their answers are shown in Table 4. The results showed that the majority of respondents (61.6) were found to harvest crops 1-5 days after pesticides application, which is not recommended and some times even dangerous.

Storage of pesticides

Farmers were asked about places where they store their pesticides and their answers are shown in Table 5. The results showed that the majority of respondents (55.8%) stored their pesticides in unrecommended places such as bathrooms, saloons, open yards, shelters in fields, canals and pits in fields. Even the stores which were used by a large number of farmers

(44.2%) were found to be stuffed with other materials such as sorghum or other food items.

Empty containers disposal

Farmers were asked about the methods of disposing of empty containers and their answers are shown in Table 6. The results revealed that 73.3% of the respondents were not adopting the recommended methods of disposing of empty containers. According to Mathews (1979), the empty containers should be buried in pits at least 1.5 m deep.

Reading the label before using pesticides

The farmers were asked if they used to read the label before using pesticides and they were also asked about mixing two or more pesticides to increase their potency (Table 7). The results showed that 45% of respondents had never read the label before using pesticides. Probably this is due to the high percentage of illiteracy among them. It's very important to read the label because it shows the manufacturing date, usage, methods of application, hazards *etc.* The results revealed that 37.5 % of respondents never mixed pesticides together. Mathews (1979) stated that toxicity of mixtures to man and other organisms may be increased, and their residues may persist longer.

Association between sources of information and farmers' knowledge and practices of pesticides

Table 8 shows a high significant association between methods of information dissemination and farmer's skill and knowledge of wearing protective clothes. Tenants who obtained their information from agricultural agents and T.V had more knowledge about wearing protective clothes than others.

Table 8 shows a significant association between sources of dissemination of information and farmers knowledge of the recommended safety period of pesticides. The result showed that those who received their information from agricultural

agents had a high percentage of adopting the recommended safety period than those who received information from other sources.

The result in Table 9 showed a high significant association between sources of information and farmers skills and knowledge of empty containers disposal methods. This means that tenants who received information from agricultural agents showed a high percentage of knowledge of recommended methods of disposing empty containers (buried away) than those who received information from other sources.

Table 10 showed no significant association between sources of dissemination of information and respondent's attitudes towards reading the labels before applying pesticides. There was a significant association between respondent's attitudes towards mixing two or more pesticides and sources of information. Respondents who got their information from agricultural agents showed a high level of awareness of hazards of mixing pesticides compared to those who got information from other sources.

The findings of this study have revealed the absence of extension services in many aspects related to pesticides activities such as safety precaution, methods of disposing empty containers, *etc.* Also, here is a lack of training courses in the field of pesticides. The study indicated that some farmers acquired their information from non-official sources, and the main providers of pesticides to farmers were the unauthorized sources. Also, the study showed that T.V and radio were not fully exploited as methods of dissemination of agricultural information. From chi-square tests, it was found that agricultural agents were the best in conveying knowledge and skills to farmers and assisting them to take right decisions about pesticides application, followed by T.V and radio.

Based on the findings of the study, the following recommendation can be drawn: Rahad Scheme administration

should give more attention to dissemination of agricultural information to farmers so as to boost their awareness about pesticides. Laws and regulations should be implemented to prohibit unauthorized trade and improper use of pesticides. Adequate protective clothes should be provided in all areas of the Rahad Scheme.

Table1. Distribution of farmers according to training in pesticides application and wearing protective clothes when applying pesticides

	Had training		Wearing protective clothes	
	Frequency	Percent	Frequency	Percent
Yes	32	26.7	32	26.7
No	88	73.3	88	73.3
Total	120	100	120	100

Table 2. Distribution of respondents according to sources of information.

Information sources	Frequency	Percent
Radio	10	8.3
T.V	3	2.5
Agricultural agents	26	21.8
Colleagues and neighbors	49	40.8
Salesmen	31	25.8
Others	1	0.8
Total	120	100

Table 3. Distribution of farmers according to the sources of pesticides.

Sources of pesticides	Frequency	Percent
Local market	97	80.8
Agric-companies and offices	20	16.7
Others	3	2.5
Total	120	100

Table 4. Distribution of farmers by their awareness of considering the safety period.

Safely period (days)	Frequency	Percent
1 – 3	49	40.8
3 – 5	25	20.8
5 – 7	12	10
More than 7	28	23.3
According to recommendation	6	5
Total	120	100

Table 5. Distribution of farmers according to their practice of storing pesticides.

Place of storing pesticides	Frequency	Percent
In the store	53	44.2
Bathroom	7	5.8
Saloon	1	0.8
Open yard	10	8.3
Other	49	40.8
Total	120	100

Table 6. Distribution of respondents according to practices and knowledge about the methods of disposing of empty containers.

Methods of empty containers disposal	Frequency	Percent
Lay it in canals	38	31.7
Bury	32	26.7
Clean and use in house	4	3.3
Burn	46	38.3
Total	120	100

Table 7. Distribution of respondents according to attitudes towards reading the label before applying pesticides and mixing of pesticides to increase their potency.

	Reading the label		Mix two or more pesticides together	
	Frequency	Percent	Frequency	Percent
Always	46	38.3	33	27.5
Sometimes	15	12.5	36	30.0
Rarely	2	1.7	5	4.2
Very rarely	3	2.5	1	0.8
Never	54	45	45	37.5
Total	120	100	120	100

Table 8. Chi-square test showing the association between sources of information and knowledge of safety period and knowledge of wearing protective clothes.

Sources of information	Safety period (days)					Sig. test	Wearing protective clothes		Sig. test
	1-3	3-5	5-7	More than 7	According To recommendation		Yes	No	
Radio	7	3	0	0	0	1	9	0.013** 0.001**	
T.V	2	1	0	0	0	2	1		
Agric-agents	2	6	4	9	5	15	11		
Colleagues and neighbors	26	8	5	10	0	7	42		
Salesmen	12	7	3	8	1	7	24		
Others	0	0	0	1	0	0	1		

** and *** Significant at 1% and 0.1% levels, respectively.

Table 9. Chi-square for the association between sources of information and farmers' knowledge and practices of disposing empty containers.

Information sources	Methods of empty containers disposal				Sig. test
	Lay in canal	Bury	Clean and use in house	Burn	
Radio	5	1	1	3	0.005**
T.V	0	0	0	3	
Agric-agents	4	16	1	5	
Colleagues and neighbors	20	11	1	17	
Salesmen	9	4	1	17	
Others	0	0	0	1	

*Significant at 0.1% level.

Table 10. Chi-square test for association between respondent's attitudes of reading the label and sources of information.

Sources of information	Always	Sometimes	Rarely	Very rarely	Never	Sig. test
Radio	1	1	0	0	8	0.074
T.V	2	0	0	0	1	
Agric-agents	16	6	0	0	4	
Colleagues and neighbors	14	7	2	3	23	
Salesmen	13	1	0	0	17	
Others	0	0	0	0	1	
	Mixing two or more pesticides					
Radio	4	4	0	0	2	0.043*
T.V	1	2	0	0	0	
Agric-agents	0	7	2	0	17	
Colleagues and neighbors	17	11	0	1	20	
Salesmen	11	11	3	0	6	
Others	0	1	0	0	0	

Significant at 5% level.

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أثر نشر المعلومات الزراعية عن مخاطر المبيدات على معارف واتجاهات
ممارسات المزارعين (دراسة حالة : مشروع الرهد ، السودان)

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الخلاصة

المبيدات الحشرية سموم تستخدم لوقاية المحاصيل من الآفات
وإذا لم تستخدم بالطرق الصحيحة يمكن أن تصبح ذات خطورة
على صحة الإنسان وبيئته. نفذت هذه الدراسة لتقويم أثر نشر
المعلومات الزراعية عن مخاطر المبيدات على معارف واتجاهات
وممارسات المزارعين الخاصة باستخدام المبيدات. تم جمع المعلومات
عن طريق الاستبيان والمقابلات الشخصية لعدد مائة وعشرين مزارع
تم اختباره عشوائياً من ستة قرى بالقسم الشمالي لمشروع الرهد.
استخدم التوزيع التكراري والنسبة المئوية ومربع كأي في تحليل
المعلومات. أظهرت النتائج أن 61.6% من المزارعين يتحصلون على
معلوماتهم عن المبيدات من مصادر غير رسمية وغير موثوق بها وأن
المزارعين لا يستخدمون الملابس الواقية لأنها غير متوفرة وأن الإذاعة
والتلفزيون كمصدر للمعلومات اعتمد عليها قلة من المزارعين. كما
أظهر البحث أن المرشدين والمفتشين الزراعيين هم أفضل من ينقل
معارف الاتجاهات الصحيحة عن المبيدات ويساعد المزارعين على

- تطبيقها. مما تقدم وبناء على نتائج البحث يوصي البحث بالاتي: أن تهتم إدارة مشروع الرهد بنشر المعلومات عن المبيدات:
- 1/ أن تهتم ادارة مشروع الرهد على تدريب المتعاملين في تداول المبيدات لزيادة معارفهم وتحسين مهاراتهم في استخدام المبيدات.
 - 2/ ان تمنع ادارة المشروع التجارة غير المرخصة والاستخدامات الخاطئة .
 - 3/ على إدارة المشروع أن تعمل على توفير الملابس الواقية وبأقل تكلفة ممكنة حتى يتسع نطاق استخدامها وسط المزارعين.