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Analysis of Pesticide Residue Content in Rice in the Region Aceh Besar District

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ABSTRACK

The use of pesticides from year to year is increasing. Spraying pesticides on rice can leave residues in the environment and the rice. Pesticide residues are found in soil, water, crops, and harvested commodities. The study aimed to analyze pesticide residues in harvested rice in the district of Aceh Besar. This type of research is descriptive by conducting laboratory examinations using qualitative tests, namely knowing the presence or absence of pesticide residues in rice. The samples were examined using a pesticide test strip G9 fast pesticides detection kit. The research subject is rice from rice that has been sprayed from planting to harvest and taken from farmers in Aceh Besar district. Sampling was done by purposive sampling, taking as many as 30 points in six sub-districts in the district of Aceh Besar. The results of the analysis showed that 29 negative samples contained pesticide residues, there was only 1 positive sample which was indicated by the absence of a blue color change in one of the reagent areas. These results can be influenced by the use of pesticides by farmers who are still below the threshold value, low frequency of spraying, and the influence of rainfall which causes pesticide residues to accumulate with water.It is necessary to carry out repeated analyses of the pesticide content in rice, considering the analysis results are highly dependent on the intensity of pesticide use by farmers and are influenced by the season/rainfall.

Keywords: residue, pesticide, rice

Introdaction

The use of pesticides from year to year is increasing. This is inseparable from the benefits felt by the community from the use of these pesticides. One of the roles of pesticides is to help overcome the problem of pest organisms and plant diseases. Even pesticides become a very important tool in increasing agricultural production. This causes pesticides to become a means of controlling plant pests and diseases that play an important role and are needed by farmers.[1]

The dangers of pesticides to humans, especially consumers, make the use of pesticides must be done wisely and carefully. Every use of pesticides in the agricultural production process always has the potential to leave pesticide residues on agricultural products. Residues can pose a hazard to public health, especially to consumers.[2]

Pesticide residues on plants can come from spraying on plants. Insecticide residues are found in all plant bodies such as stems, leaves, fruits, and roots. Especially in fruit, this residue is found on the surface and flesh of the fruit. Even after washing or cooking, pesticide residues are still present in foodstuffs.[3] Rice is one of the most

important grains in the world for human consumption. Most the farmers are used to it and it is almost impossible to grow rice without chemical fertilizers and pesticides. The chemical composition of rice varies depending on the variety and processing method.[4]

Pesticide poisoning in rice can occur due to the presence of pesticide residues in the rice. Although pesticide residues contained in rice are in small amounts, if they are continuously consumed, the pesticides will accumulate in the human body and have an impact on health.

Research purposes

The purpose of the study was to analyze the pesticide residue content in rice harvested from farmers in Aceh Besar District.

Methods

This type of research is qualitative by conducting laboratory examinations on rice samples to determine the presence or absence of pesticide residues in the rice. The research subject is rice taken from farmers in the Aceh Besar district. The sampling method in this study was purposive sampling, namely, the sample was taken based on the criteria of the researcher. In this case, the sample is taken to represent the sub-districts with superior agricultural productivity. The data obtained is in the form of laboratory examination results which are processed manually by identifying pesticide residues

organophosphate groups in rice samples and then the data is grouped according to the presence or absence of pesticide residues in rice.

Result and Discussion

Table 1. Results of Identification of Organophosphate and Carbamate Pesticide Residue Content in Rice (n = 30 sample locations)

No	Description	Code Sample	Organophosphate and Carbamate pesticide residues		Conclusion
			Positive	Negative	
1	Point 1	A1	-	√	No pesticide residue
2	Point 2	A2	-	√	No pesticide residue
3	Point 3	A3	-	√	No pesticide residue
4	Point 4	A4	-	√	No pesticide residue
5	Point 5	A5	-	√	No pesticide residue
6	Point 6	A6	-	√	No pesticide residue
7	Point 7	A7	-	√	No pesticide residue
8	Point 8	A8	-	√	No pesticide residue
9	Point 9	A9	-	√	No pesticide residue
10	Point 10	A10	-	√	No pesticide residue
11	Point 11	A11	-	√	No pesticide residue

12	Point 12	A12	-	√	No pesticide residue
13	Point 13	A13	-	√	No pesticide residue
14	Point 14	A14	-	√	No pesticide residue
15	Point 15	A15	-	√	No pesticide residue
16	Point 16	A16	-	√	No pesticide residue
17	Point 17	A17	-	√	No pesticide residue
18	Point 18	A18	-	√	No pesticide residue
19	Point 19	A19	-	√	No pesticide residue
20	Point 20	A20	-	√	No pesticide residue
21	Point 21	A21	√	-	contains pesticide residues
22	Point 22	A22	-	√	No pesticide residue
23	Point 23	A23	-	√	No pesticide residue
24	Point 24	A24	-	√	No pesticide residue
25	Point 25	A25	-	√	No pesticide residue
26	Point 26	A26	-	√	No pesticide residue
27	Point 27	A27	-	√	No pesticide residue
28	Point 28	A28	-	√	No pesticide residue
29	Point 29	A29	-	√	No pesticide residue
30	Point 30	A30	-	√	No pesticide residue

The results of table 1. above can be simplified as follows:

Sample Point	Pesticide Residues Point Sample					
	A	B	C	D	E	F
1.	-	-	-	-	-	-
2.	-	-	-	-	-	-
3.	-	-	-	-	-	-
4.	-	-	+	-	-	-
5.	-	-	-	-	-	-

Note: (-) indicates no pesticide residue
(+) there is pesticide residue

From the results of the examination of the pesticide content at 30 sample points of rice, there is one sample that is indicated positive for containing pesticides where (test results using the pesticide test strip G9 fast pesticides detection kit), the sample strip with code A21 does not change color in any of the areas. reactor. As for the other samples, there was a color change in the reagent area so the results were negative.

Before the sample was taken, farmers were first interviewed about the use of pesticides with the question of whether to use pesticides on their rice plants or not, this was in accordance with the sample criteria, namely rice from rice that had been sprayed with pesticides, the next question was when to spray on rice, how much times using pesticides from planting to harvesting, when was the last pesticide spraying before harvesting and whether there was any influence of weather during the harvest season.

Based on the results of interviews, researchers received information that farmers spraying rice plants starting when the rice plants are 10 days or 1 week after planting, depending on the need if there are pests and

diseases on rice plants. The frequency of spraying in one harvest is an average of 1 to 2 times. The last spraying of pesticides on rice plants is usually done before the rice ducks down or the rice has entered harvest time. Meanwhile, the pesticides used in pest control vary with different types and trademarks from one farmer to another.

Joint Decree of the Minister of Health and the Minister of Agriculture Number: 881/MENKES/SKB/VIII/1996;711/Kits/TP.270/8/1996) stipulates the maximum limit of pesticide residue is 0.05 ppm. Indonesian National Standard Agency 2008, regarding the maximum limit of pesticide residues in plants, pesticide residues for chlorpyrifos are still allowed to exist in plants in predetermined concentrations, specifically for rice the allowable residue concentration limit is 0.5 mg/kg and in the decision together with the Minister of Health and the Minister of agriculture, the permissible level of pesticide residue for the chlorpyrifos organophosphate group is 0.1 mg/kg and 2 mg/kg for dichlorvos.

The negative results of the presence of pesticide residues in farmers' rice in the Aceh Besar District may be caused by several things, including the pesticides used by farmers including the pesticide group that is allowed to be used in controlling plant pests and diseases and is contact. The pesticide does apply was appropriate and followed the established recommendations or even the application was under the recommended dose. At the time of planting rice, it is also influenced by the frequency of the frequent rainy season so that pesticide residues attached to the outside of the rice plant are washed and carried away with rainwater and surface water, resulting in relatively few pesticides accumulated in the rice.

The amount of rainfall affects pesticide residues on plants.[6] Rain can wash off pesticides on the surface of plants. Furthermore, low doses also allow lower pesticide residues on plants. This situation causes the presence of pesticide residues in rice to decompose and dissolve quickly and pose no danger. Organophosphate group pesticides are allowed to be used in Indonesia and can be deactivated in the environment.[78] Rainwater can dissolve pesticides that are stuck on the surface of the plant canopy, then carried by surface runoff to receiving water bodies such as rivers. Pesticides that are non-systemic or contact and not persistent, result in pesticides not being absorbed by plant tissues, but only sticking to the outside of the plant.

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Conclusion

The results of the analysis of the pesticide residue content in rice in the district of Aceh Besar were negative. These results can be influenced by the use of pesticides by farmers who are still below the threshold value, low frequency of spraying, and the influence of rainfall which causes pesticide residues to accumulate with water. It is necessary to repeatedly analyze the pesticide content in this

rice, considering the results of the analysis are very dependent on the behavior of pesticide use by farmers and are influenced by the season/rainfall.

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