

## FARMER BEHAVIORS IN A PEST CONTROL FOR SPRAYING CHEMICAL PESTICIDES IN SANDEN SUBDISTRICT, BANTUL REGENCY

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### ABSTRACT

Shallot is one of the important commodities grown by farmers in Bantul regency. Cultivating shallots is uneasy due to many obstacles faced, one of them is pest attack. To control pests, farmers spray pesticides as a solution. Spraying of pesticides must be in accordance with the Standard Operating Procedures (SOP). This research is located in Sanden Subdistrict, Bantul Regency with the following objectives: (1) To determine the behavior of farmers towards controlling plant pests by spraying chemical pesticides in Sanden Subdistrict, Bantul Regency, and (2) To analyze the factors that influence the behavior of farmers in controlling plant pests by spraying chemical pesticides in Sanden Subdistrict, Bantul Regency. The method used in this research is quantitative descriptive method. Respondents were drawn from 5 farmer groups, they are Kelompok Tani Ngudi Makmur, Bukti Tani, Malangan, Ngudi Rejeki and Tani Maju with the total number of 60 farmers. The sample was chosen by using simple random sampling. The results showed that less than and equal to fifty percent ( $\leq 50\%$ ) of farmers in Sanden Subdistrict, Bantul Regency had disobedient behavior when spraying chemical pesticides to control plant pests. Factors that influence the behavior of farmers in controlling plant pests by spraying chemical pesticides are motivation, attitude, group role, instructor role, and group membership activity. The higher the motivation, the behavior of farmers will increasingly disobey the rules. The worse the attitude, the behavior of farmers will increasingly disobey the rules. The lower the role of the group, the behavior of farmers will increasingly disobey the rules. The less active members are, the behavior of farmers will be more disobedient and the higher the role of extension agents, the behavior of farmers will be more disobedient.

Keyword: *shallots, behavior, pesticide, spray pesticides, plant pests*

### INTRODUCTION

Farmer is the name for those who run agricultural businesses, and farmers can additionally be defined as people who depend on agricultural land for their main livelihood (Welia *et al.*, 2013).

Sanden Subdistrict, Bantul Regency, in Yogyakarta has potential in agriculture. All this time, Sanden is well known as a shallot producing area. This business needs to be developed, considering that this commodity is a superior commodity and can contribute to regional income. However, in shallot cultivation there are many obstacles, one of which is plant pests. This has made farmers strive to produce quality and quality products, therefore that chemical pesticides are used as a solution. The use of pesticides must be in accordance with the rules to maintain a certain level of appearance or conditions therefore a job can be completed safely and effectively. However, nowadays, farmers are

still reluctant to apply pesticides according to regulations. This has resulted in many cases due to improper use of pesticides, such as poisoning to farmers, high levels of pesticide residues and environmental pollution. The World Health Organization (WHO) estimates that every year 1-5 million cases of pesticide poisoning occur in agricultural workers, most of which (80%) occur in developing countries (Mahampang *et al.*, 2012).

In using pesticides, farmers should apply them according to standard operating procedures. The actions of farmers take to apply pesticides are called behaviors. Behavior is an born attitude due to the interaction between humans and the environment, therefore individual and community behavior by influencing environmental conditions and public awareness can influence this (Setyowati *et al.*, 2013).

### METHOD

This research was conducted in Srigading Village, Sanden Subdistrict, Bantul Regency. In this study, behavior refers to the SOP (Standard Operating Procedure) for spraying chemical pesticides. The behavior is shown through the disobedience of farmers in spraying chemical pesticides according to the SOP (rules). Disobedience to the rules is indicated by the never and rarely categories.

Sampling of farmers / respondents was

carried out using simple random sampling method. Respondents will be drawn from 5 farmer groups, namely Ngudi Makmur Farmer Group, Evidence Tani, Malangan, Ngudi Rejeki and Tani Maju. The five farmer groups were chosen because they always chose the commodity of shallots every year and made shallots a leading commodity. Each farmer group was taken as many as 12 respondents. Overall, the sample taken is 60 farmers.

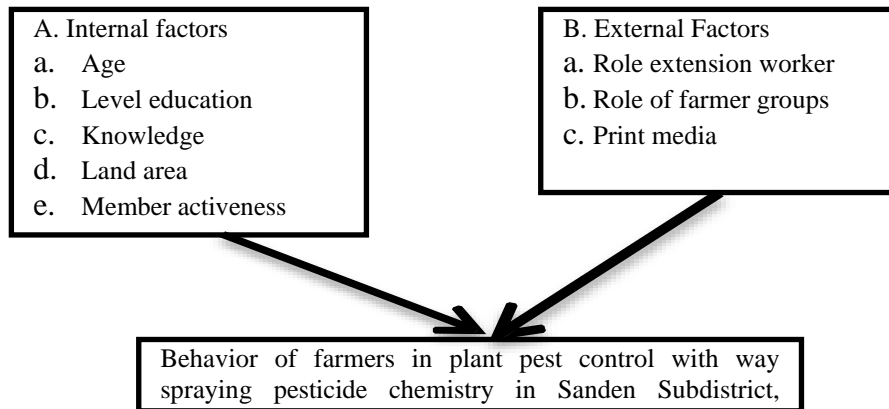


Figure 1. Conceptual Framework.

**RESULTS**

The behavior of farmers in this study was the behavior of farmers towards plant pest control by spraying chemical pesticides. Obtained the results as following:

Table 6.8. Distribution of farmer behavior in Srigading Village.

No.	Category	Score	Number of people	Percentage (%)
1.	Not ever	0-6	4	6.45
2.	Rarely	7-12	8	12.90
3.	Sometimes	13-18	13-18	45.16
4.	Often	19-24	19-24	27.42
5.	Always	24-30	24-30	8.06
Jumlah			62	100.00

Source: Primary data analysis, 2019

From Table 6.8. obtained a distribution of 6.45% who said never. As much as 12.90% stated that it is rare. As much as 45.16% said sometimes. As many as 27.49% said often and as much as 8.06% said often. The largest percentage was 45.16%, this shows that most of the farmers in Srigading Village sometimes behave in applying SOP (Standard Operating Procedures) in spraying chemical pesticides to control plant pests. This is due to various reasons, such as too much trouble in using PPE (Personal Protective Equipment) and the plant pests and diseases have become resistant to the dosage.

The level of farmer behavior towards plant pest control by spraying chemical pesticides in Srigading Village can be determined by analyzing data using the proportion test as follows:

$$Z \text{ hit} = \frac{\frac{x}{n} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}}$$

Where:

- Z hit = Z test stat
- P<sub>0</sub> = Proportion of population (50%)
- X = Number of visitors who have frequent and always have never and rarely behavior towards spraying chemical pesticides to control plant pests.
- N = The total number of sample

**Hypothesis:**

- H<sub>0</sub> = P ≤ 50%
- H<sub>a</sub> = P > 50%

With the translation:

- P = The proportion of the sample that has behavior
- Ho = a small proportion (≤50%) of farmers in Sanden Subdistrict, Bantul Regency have disobedient behavior when spraying pesticides chemistry to controlling plant pests.
- Ha = most (> 50%) farmers in Sanden Subdistrict, Bantul Regency have disobedient behavior when spraying pesticides chemistry to controlling plant pests.

The level of signification used is 0.1 (10%)

**Testing criteria**

Zhit > ZTable = Ho rejected, Ha be accepted

Zhit ≤ Z Table = Ho be accepted, Ha rejected

Test statistics:

$$Z \text{ hit} = \frac{\frac{x}{n} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}}$$

$$Z \text{ hit} = \frac{\frac{12}{60} - 0.5}{\sqrt{\frac{0.5(1-0.5)}{60}}}$$

$$Z \text{ hit} = \frac{-0.3}{0.064}$$

Z hit = - 4.688

Conclusion:

Zhitung: - 4.688

Z table: - 1.645

Z count Zhit ≤ Z table, then Ho is accepted, Ha is rejected

Based on the results of the calculation, the calculated Z value is - 4.688. The Z-value of the Table is -1,645. The calculated Z value obtained shows that the calculated Z value is smaller than the Z table. This shows that Ho is accepted and Ha is rejected. This means that a small proportion (≤50%) of farmers in Sanden Subdistrict, Bantul Regency, have disobedient behavior when spraying chemical pesticides to control plant pests.

In addition, this study also serves to determine the factors that are involved influence the behavior of farmers towards control plant pests use analysis Multiple linear regression, the results of multiple linear regression analysis model 6 can be seen in Table 6.10.

Table 6.10 The results of multiple linear analysis regarding the factors that influence farmer behavior towards plant pest control (Plant Pest Organisms) by spraying chemical pesticides (model 6)

No.	Variable	Coefficient Regression (B)	t Count	Sig.	Information
1.	Motivation (X5)	-0.252	-2,817	0.007	*
2.	Attitude (X6)	0.306	2,557	0.013	*
3.	Member activeness (X7)	0.337	1,900	0.063	*
4.	Group Role (X8)	0.290	2,983	0.004	*
5.	role of instructor (X9)	-0,209	-1,901	0.063	*
	Constant	16,492			
	R Square	0.331			
	Adjusted R Square	0.269			
	F count	5,347			
	F table	2.05			

Information :

\*: Significant NS: Nonsignificant

Source: Primary data analysis, 2019

1. Motivation

Based on the value of the multiple linear regression equation, it can be  $Y = 16.492 - 0.252X_5$ , therefore the coefficient value of the motivation variable is -0.252 is negative. The negative value indicates that the higher the motivation, the lower the farmer's behavior towards plant pest control by spraying chemical pesticides in the village of Srigading to be disobedient to the rules, by decreasing 0.252

units. Hypothesis is not in accordance with the results obtained, this is because farmers in Srigading Village are afraid of the risk of crop failure, they prioritize profits to meet basic needs. Farmers in Srigading Village are peasant farmers / subsistence farmer. They have high motivation to spray pesticides. The high level of pest attack makes farmers no longer use pesticides for control, however as an effort for pests to appear in the plant. They are not only afraid of the risk of

crop failure, however they are afraid that their shallot yields do not match what they expect therefore it will have an impact on the selling price, which will affect their basic needs. What they do to anticipate failure is to spray chemical pesticides that never or rarely comply with the rules, in other words, the frequency is as often as possible once a day, even some farmers spray pesticides twice a day. This is not in compliance with the spraying rules pesticide. They assume that the more frequent spraying of chemical pesticides, the plant pests will die quickly and will not appear, therefore they can overcome the problem of plant pest. This is in accordance with the peasant theory which reveals that peasants is farmer who control a few natural resources. They are often referred to as smallholders, including farm laborers (Dewi, 2007). They depend on their livelihoods from farming and the inputs they produce to fulfill their daily needs, therefore they minimize the risks involved.

## 2. Attitude

Based on the results of multiple linear regression analysis, it can be seen that the value of the regression equation is  $Y = 16.492 + 0.306X_6$ , the coefficient value of the attitude variable is 0.306 which is positive. A positive value shows a relationship between attitudes that are unidirectional to farmer behavior, which means that the worse the attitude will decrease the behavior of farmers towards plant pest control by spraying chemical pesticides in Srigading Village that obey the rules, by increasing 0.306 units. The initial hypothesis was accepted that the worse the attitude, the farmer's behavior was not obeying the rules. For example farmers are hesitant to mix dosages according to the rules on the packaging therefore the plant pests die quickly, this shows that the farmer's attitude is bad which will affect the behavior of farmers who do not obey the rules for spraying pesticides.

## 3. Member activeness

Based on the results of multiple linear regression analysis, it can be seen the value of the equation regression amounting to  $Y = 16.492 + 0.337X_7$ . the coefficient value of the group role variable is 0.337 which is positive. The positive value shows the relationship between the role of the group which is in line with the behavior of the farmers, which means that the lower the role of the group will reduce the behavior of farmers towards plant pest control by spraying chemical pesticides in Srigading Village that obey the rules, by increasing 0.337 units. The results obtained are in accordance with the initial hypothesis which indicates that the more inactive members of the farmer group are, the more the farmer's behavior

to spray chemical pesticides is less obedient to the rules. In the frequency of attendance, most of the farmers often attend group routine gatherings. However, when they are not active in the event, it is like farmers who rarely convey new ideas / ideas. The new ideas / ideas that will be presented are related to the knowledge, experience, and opinion of the farmers who are conveyed. When they rarely convey ideas / ideas, there is no process of sharing information that will affect their knowledge, therefore farmers carry out what behavior they only know.

## 4. Group roles

Based on the results of multiple linear regression analysis, it can be seen that the value of the regression equation is equal to  $Y = 16.492 + 0.290X_8$ , the coefficient value of the group role variable is 0.290 which is positive. The positive value shows the relationship between the role of the group which is in line with the behavior of the farmers, which means that the lower the role of the group will reduce the behavior of farmers towards plant pest control by spraying chemical pesticides in Srigading Village that obey the rules, by increasing 0.290 units. Hypothesis of the study, the lower the role of farmer groups, the farmer's behavior in spraying chemical pesticides is increasingly disobeying the rules. This is because farmer groups do not have a role as learning media, cooperation media, production units, and collective decision-making units. Lack of role of farmer groups will reduce farmer behavior, for example farmer groups do not cooperate with sales, other farmer groups, as well as extension workers to provide personal protective equipment and information on how to control plant pests in accordance with the rules by using chemical pesticides. This has resulted in many farmers who do not use complete attributes when spraying and how to spray that is not according to the rules.

## 5. The role of extension worker

Based on the results of multiple linear regression analysis, it can be seen that the value of the regression equation is  $Y = 16.492 - 0.209X_9$ , the coefficient value of the extension agent variable is -0.209 is negative. The negative value shows that the higher the role of the extension agents, the lower the behavior of farmers towards plant pest control by spraying chemical pesticides in the village of Srigading to become disobedient, by reducing 0.209 units. Hypothesis is not in accordance with the results of the analysis, the higher the role of the extension worker, the more the farmer's behavior will be disobedient. This is because the image of the extension in front of farmers is bad. Extension workers are rarely

present in farmer group associations. In addition, farmers assume that extension workers only know what is being taught is limited to theory. Farmers feel smarter and know more about what is in the field, therefore they spray pesticides according to what they believe. For example, using pesticides before plant pests appear in the plant and exaggerating the dosage therefore plant pests die quickly. The lack of trust in the extension agents makes the information conveyed by the extension agents just pass, in other words the information is only received, but not applied.

## CONCLUSION

1. Less than the same as ( $\leq 50\%$ ) farmers in Sanden Subdistrict, Bantul Regency, have disobedient behavior when spraying chemical pesticides to control plant pests.
2. The factors that influence farmer behavior in plant pest control by spraying chemical pesticides are motivation, attitudes, role of groups, role of extension workers, and the activeness of members, with the following directions:
  - a. The higher the motivation, the more the farmer's behavior to spray chemical pesticides will not obey the rules.
  - b. The worse the attitude, the farmer's behavior to spray chemical pesticides, the more they disobey the rules.
  - c. The lower the role of the group, the farmer's behavior in spraying chemical pesticides, the less they obey the rules, namely never and rarely.
  - d. The less active the members are, the less the farmer's behavior in spraying chemical pesticides will not obey the rules.
  - e. The higher the role of the extension workers, the farmer's behavior in spraying chemical pesticides is increasingly disobeying the rules.

## SUGGESTION

Suggestions that can be conveyed based on the results of research on farmer behavior in plant pest control by spraying chemical pesticides are:

1. To increase the role of extension workers and the agency to collaborate through farmer groups by establishing field schools regarding the manufacture of natural pesticides, promotion of making natural pesticides in each farmer group.
2. To increase knowledge by holding extension workers in collaboration with farmer groups to

provide complete counseling on PPE, along with the functions and examples of PPE in real time.

3. To improve a good attitude, the extension worker collaborates with the agency to conduct counseling on the use of chemical pesticides in accordance with the rules by inserting information about the positive impact of applying pesticides according to the rules, for example for health, for the environment and for farmers' expenses for production costs.
4. To increase member activeness in routine association forums, the event should be made interesting, for example with a Focus Group Discussion (FGD) therefore the ideas of each member can be channeled and considered as a joint decision.
5. To increase the motivation of farmers to become modern farmers, farmer groups need to conduct comparative studies to successful shallot-producing areas using organic farming technology.
6. To increase the role of print media, it is better if sales and extension workers convey information using attractive leaflet props, according to farmers' needs and using language that is easily accepted by farmers. In addition, before making props when conveying information to farmers, it is a good idea to conduct a survey of what problems there are farmer groups that will be the target of information.
7. To improve the extension of the extension's image, it is better if the extension worker comes even if it is not long before the farmer group association forum therefore the farmers feel that they are being cared for by the extension agent. This will increase the good image of the extension worker.
8. To maintain farmers' motivation, but not reduce their behavior, it can be done by creating a pesticide use program that is in accordance with the rules and presenting inspiring farmers who have cultivated environmentally friendly products.

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