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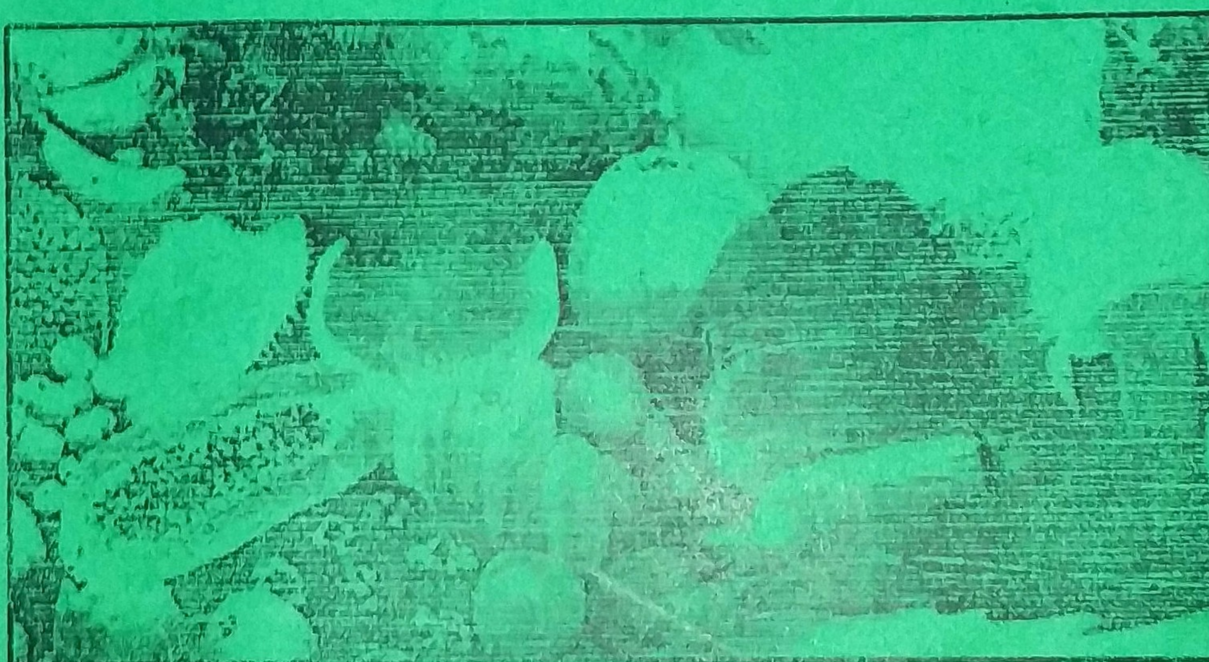
PROCEEDING

International Seminar

on Horticulture to Support Food Security 2010

June 22-23 ,2010
Bandar Lampung, INDONESIA



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KENTUCKY

HALAMAN PENGESAHAN

Judul : Correlation of Farmer Socioeconomic Factors and Apllication Integrated Pest Management of Shallot (*allium ascalonicum*.L)

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PREFACE

Growing populations across the world, economic growth and changes in dietary patterns have caused both the production and consumption of horticultural produce, mainly fruit and vegetables, increasingly important. Horticulture, which includes the production of fruits, vegetables, flowers, spices, medicinal and aromatic plants and plantation crops, has a vital role in farm income enhancement, poverty alleviation, food security, as well as sustainable agriculture. However, this sector severely suffers from postharvest losses. Some estimates suggest that about 30–40% of fruit and vegetables are lost or abendoned after being harvested. Huge postharvest losses result in diminished returns for producers, and reduced food availability.

It is very clear that postharvest management determines food quality and safety, competitiveness in the market, and the profits earned by producers. However, the postharvest management of fruit and vegetables in most developing countries is very poor.

The major constraints include inefficient handling and transportation; poor technologies for storage, processing, and packaging; and poor infrastructure.

In order to overcome the incidence of the huge postharvest losses in the region and new challenges faced under trade liberalization and globalization, serious efforts are needed to reduce postharvest losses of horticultural produce, and to support food security.

Therefore, the University of Lampung in collaboration with the Government of Lampung Province as well as the University of Kentucky USA has organized this seminar with the objectives: 1) to discuss recent developments in postharvest handling, processing and marketing of horticultural produce, 2) to identify issues and constrains to reduce postharvest losses, 3) to define strategies and measures to reduce such losses in order to support food security, 4) to discuss marketing and food security issues, and challenges in the postharvest management of horticultural produce, issues and obstacles to improve the marketing and safety of postharvest handling and processing of horticultural produce.

It is our hope that serious consideration will be given to the recommendations of International Seminar on Horticulture to Support Food Security in shaping the future development of the production, postharvest handling, processing and marketing of horticultural produce.

June 22, 2010

Organizing Committee
International Seminar for Horticulture to Support Food Security 2010
Bandar Lampung - Indonesia

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ORGANIZING COMMITTEE ★ ISHSFS 2010 ★ UNIVERSITY OF LAMPUNG

EVENT SCHEDULE

TIME			MODERATOR	SPEAKERS
	Tuesday - June 22, 2010			
08.00–08.30	**Registration**			
	Opening Ceremony			
08.30–08.40	Report from ISHSFS's Chairman			Sandi Asmara, M.Si.
08.40–09.00	Speech from Rector of University of Lampung			Prof. Dr. Ir. Sugeng P. Harianto, M.S.
09.00–09.30	Speech and Event Opening Governor of Lampung's Province			Drs. Hi. Sjachroedin S.Z.P., S.H.
09.30–09.40	Prayer			Dr. Ir. Hi. M.A. Syamsul Arif, M.Sc.
09.40–10.00	**Break**			
10.00–12.00	Key Note Speakers 1. Directorate General of Horticulture, Department of Agriculture Republic of Indonesia 2. Horticulture Department, College of Agriculture University of Kentucky, USA		Prof. Dr. Ir. Tirza Hanum, M.S.	Dr. Ir. Ahmad Dimyati Prof. Douglas Archbold, Ph.D.
12.00–13.00	Lunch and Prayer			
13.00–15.00	Plenary Speakers :		Prof. Dr. Ir. Bustanul Arifin, M.Sc	Ir. Bihikmi Soefian, M.M Prof. Dr. Ir. S. Esti Widodo Hasan J. Widjaja, M.Engr Ir. Nurjaya, M.M. Ir. I Made Donny Waspada
15.40–17.00	**Parallel Seminar**			
	Group A: Horticultural Biology and Physiology	Group B: Horticultural Postharvest Handling and Processing Technology	Group C: Horticultural Pests and Diseases & Horticultural Postharvest Handling and Processing Technology	Group D: Economy of Horticulture of Food Security
15.40-16.20	Session 1	Session 1	Session 1	Session 1
16.20-17.00	Session 2	Session 2	Session 2	Session 2
	Wednesday - June 23, 2010			
08.00-14.00	**Parallel Seminar**			
	Group A: Horticultural Biology and Physiology	Group B: Horticultural Postharvest Handling and Processing Technology	Group C: Horticultural Pests and Diseases & Horticultural Postharvest Handling and Processing Technology	Group D: Economy of Horticulture of Food Security
08.00-08.40	Session 3	Session 3	Session 3	Session 3
08.40-09.20	Session 4	Session 4	Session 4	Session 4
09.20-10.00	Session 5	Session 5	Session 5	Session 5
10.00–10.20	**Break**			
10.20-11.00	Session 6	Session 6	Session 6	Session 6
11.00-11.50	Session 7	Session 7	Session 7	Session 7
11.50–13.00	**Lunch and Prayer**			
13.00-14.00	Session 8	Session 8	Session 8	Session 8
14.00	**Closing**			

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APPENDIX

CORRELATION OF FARMER SOCIOECONOMIC FACTORS AND APPLICATION INTEGRATED PEST MANAGEMENT OF SHALLOT (*Allium ascalonicum L*)

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ABSTRACT

Agricultural development can not be separated from the use of technology in the farm business. One of the technologies used in farming is a technology at integrated pest management to control pests and plant diseases that could affect the production process. The purpose of this research was to investigate 1) level of application of integrated pest management technology by farmers on farm of shallot (*Allium ascalonicum L.*), and 2) the correlations socioeconomic factors of farmers and the applications of integrated pest management technology on farm of shallot (*Allium ascalonicum L.*).

Research was conducted in Desa Pabuaran Kidul, Kecamatan Pabuaran, Cirebon, West Java, from June - August 2008. The method used was a survey method, and the samples were determined based on proportional random sampling technique with total of 53 people. The data were analyzed using nonparametric statistical analysis Spearman Correlations.

The results showed that 1) the level of application of integrated pest management by farmers in farming was still in the range of low to moderate, 2) education level, the contact between farmers with the extension agents, size of land area, and incomes of farmers who planted shallots had a correlation with the application of Integrated Pest Management (IPM), and 3) the level of experience of farmers in the farm of shallot was not correlations to the applications of integrated pest management (IPM).

Keywords: Integrated pest management, Shallot, Socioeconomic factors of farmers,

INTRODUCTION

The national development is an effort to improve the quality of human and community of Indonesia are carried out in a sustainable manner, based on the ability to take advantage of advances in science and technology and considering the challenges of global development. One direction of national development policy is to develop a food security system based on the diversity of food resources, institutional and local culture, in order to ensure the availability of food and nutrients in the required quantity and quality with attention to increasing the incomes of farmers and fishermen , as well as increased production regulated by law.

Agricultural development priorities will lead to social change in rural society towards a better life. Side of agricultural development is closely linked to the structure of rural communities is the development of progressive farming system involving the management of farming systems, ranging from the production subsystem to the distribution and consumption. The agricultural sector will continue to be improved in order to increase farmers' incomes and living standards, expand business opportunities, and expanding domestic market and abroad through an efficient and resilient agriculture, so as to improve the quality of agricultural commodities (Mubyarto, 1988).

System of agricultural development in Indonesia, which has undergone several changes and developments, ranging from courses BIMAS, INMAS, OPSUS, INSUS, and SUPRA INSUS. Such a program by applying the principle of 'Panca Usaha' package, and the intensification of Agribusiness Insight to add value to the process engineering post production. Of all the packages that have been applied technology, and pest control is one component carried out the farmers to improve the quality of agricultural production, because the pests are always making trouble in achieving expected production. This often occurs in plants shallot production decline in Cirebon is often caused by pests, including caterpillars "ulat grayak" (*spodophtera exigua*).

Plant pest control of shallot by farmers are generally carried out pest control preventive and using pesticides schedule, because of the assumption that organisms (pest) of shallots plants can not be controlled without using pesticides. According to Eddy Prasetyani Tarman (1997), that controlling pests without pesticides will lose the harvest of about 45-100%. This shows the importance of the use of pesticides that give good results, but continuous use of pesticides and does not adversely affect such selective death of predators, the occurrence of immunity in insects, then at any time will pest outbreak that can not be controlled any longer by the pesticide. Therefore, it is necessary to develop alternative pest control through a concept of integrated pest management.

Cooperation between agricultural extension agents and field officers of the company's pesticides should be improved to make aware the farmers in application integrated pest management, by making the farmer as an expert in pest control. In general farmers in the Cirebon is a small farmer, so in pest control must work together in groups of farmers. According Kasumbogo Untung (1993), that a farmer IPM or IPM farmer groups has a different behavior with conventional farmers. Behaviors or attributes, which are (a) they are capable of taking decisions independently and professionally, (2) they are able to use the method for controlling plant organisms in accordance with the principles of IPM, (3) responsive in accepting the new IPM technologies and, (4) they are capable cooperate with other farmers in the group or between groups in the implementation of IPM.

To make the farmers who possess the characteristics of the above, the farmers started with his involvement as a participant of the Field School Integrated Pest Management (SLPHT), because SLPHT designed to change the mindset of farmers who depend on pesticides be replaced with the mindset through an ecosystem approach and management of plant healthy. Through this approach was not expected to occur blasting plant pests, and then the farmer may decide that controls use of pesticides is a last alternative in pest control. Pattern approach to IPM through SLPHT in Cirebon District has successfully changed the mindset of farmers in the rice plant pest control, but there are still many farmers who have not applied the IPM, especially in the shallot palnt.

According to Suyanto, et al. (1994), there are still many farmers who routinely use excessive pesticides in controlling pests. This is not independent of socioeconomic factors of farmers such as farming experience, education level, area farm, farmer income, and frequency of contact with agricultural extension. Based on the problem, it should be investigated to what extent socio-economic level of farmers related to the application of integrated pest management technology on the shallots crop, which includes. How far the correlations between the experience of farmers in shallots farming, farmers' education level, frequency of contact between farmers and extension staff in extension, farm incomes, and farming the land area cultivated of shallots with the application of integrated pest control technology in shallots farming. The research aims to find out the correlations farmer socioeconomic factors and the application of integrated pest management technology in shallot plants (*Allium ascalonicum L*).

MATERIALS AND METHODS

The method used in this research was survey method with the case study. Observations obtained from the selected sample can be generalized for the entire population in the study area. The case study is a form of in-depth research on an aspect of social environment, including human beings within it (Nasution, 1997). Case studies can be conducted on an individual, a party of human beings or social institutions. The unit of analysis is the farmers who cultivated shallots farming. This research was conducted on shallots farmer in the Pabuaran Kidul Village, Pabuaran Sub District in Cirebon, West Java Province. Location selection was done purposively, with consideration that the area is state land that is widespread in shallot cultivation.

Sampling Techniques and Data Collection

Determining the sample in this study were randomly coated with *proportional random sampling*. This was taken in connection with the heterogeneity of the land area cultivated by farmers. In accordance with the opinion Barizi and Andi Hakim Nasution (1983), if a homogeneous population, the sampling method simple enough, but if the heterogeneous population, then sampling should use an average sampling. Secondary data obtained from the data of respondents were 58 people. To determine the sample size was based on the proportion of the population according to the formula set forth Taro Yamane (1967) in Jalaludin Rachmat (1999) is as follows :

$$n = \frac{N}{Nd^2 + 1}$$

Where : n = The sample size
N = Population
d = Precision (10%)

From the calculation of sample size, as object of this study is to sample as many as 37 people were farmers. Determination of sample farmers in this study were randomly coated with the basic stratification is widely used in farming. Furthermore, to determine the number of samples from each stratum using the formula balanced stratification (Andi Hakim Nasution and Barizi, 1983), namely :

$$nk = \frac{PK}{P} \times n$$

Where : P = The sample size
PK = Member of the sample size population in strata to- K (k = 1.2 ...., n)
n = Sample size
nk = Members of the sample in strata to- k

Stratification based on extensive sampling plots of farmers from the three groups. From the calculation of sample as in Table 1.

Table 1. Population and Sample Size in Each Strata

No.	*Strata Area (ha).*	*P*	*Pk*	*n*	*nk*	percent
1.	> 0,50 ha		16		10	27,02
2.	0,25 – 0.50		19		12	32,43
3.	< 0,25		23		15	40,55
	Amount	58	58	37	37	100

Source: Primary Data Analysis

Variable Operationalization and Data Analysis

To clarify the understanding of all the variables as outlined in this study, we need a definition of these variables, and the concept of measurement as follows :

1. Integrated pest management is the effort to control the pest by using one or more control techniques developed in one unit, to prevent economic losses and environmental damage. Farmer adoption of integrated pest management IPM components measured include: (a) cropping system, (b) farming techniques, (c) the use of natural enemies, (d) physical control

mechanics, and (e) the use of pesticides on the basis of economic threshold. For testing purposes, the research variables are translated, so that the obtained indicators or characteristics of the relevant variables, then the indicator is given a score that is the answer "as recommended / yes" were scored 1, "Not appropriate recommendations" were scored 0 . Score integrated pest management as a whole amounted to 15 and facilitate interpretation of the data obtained a score of integrated pest management are classified as follows :

a. score of 11-15 = good
b. score of 5-10 = fairly
c. score <5 = less.

2. Cultivated land area is cultivated land that is either owned or owned by another person who stated in hectares.
3. Experience farming shallot is the length of experience of farmers in farming shallot, expressed in units of years.
4. Frequency of contact with extension agents is the number of farmers associated with the field extension staff both in group meetings and in personal contacts in order to develop knowledge about IPM farmers who stated in a few times per cropping season.
5. Farmers' education level is the level of education ever undertaken by the farmers themselves. SD level were scored 1, SLTP level were scored 2 and high school level (SLTA) were scored 3
6. Farmer's income is received in the form of benefit derived from shallots farming is stated in rupiah per season.

Details of the research variables and measurement are as follows

Table 2. Research variables and measurement

No.	Variable	Indicator
1.	Farmer adoption of IPM technologies	a. Cropping Pattern b. Cultivated of shallot farm c. Natural Enemies / Biological Control d. Control of physical / mechanical e. the Chemical control
2.	Farmer Social and economic factors	a. Land area cultivated b. Experience farming c. Frequency of contact with extension agents d. Level of farmer education e. the Farm benefit

To know the relationship between the variables studied regarding the application of IPM used analysis of Spearman Rank Correlation Coefficient Test with the formula proposed by Wijaya (2000), as follows :

$$r_s = 1 - \frac{6\Sigma di^2}{N(n^2-1)}$$

If there is the same observed values, rs statistic calculated using the formula:

$$rs = \frac{\sum x^2 + \sum y^2 - \sum di^2}{2\sqrt{\sum x^2 \sum y^2}}$$

where:

$$\Sigma x^2 = \frac{N^3 - N}{12} - \Sigma Tx \quad \text{and} \quad \Sigma Tx = \Sigma \frac{t^3 - t}{12}$$

$$\Sigma y^2 = \frac{N^3 - N}{12} - \Sigma Ty \quad \text{and} \quad \Sigma Ty = \Sigma \frac{t^3 - t}{12}$$

To determine the relationship between land use, farming experience, and frequency of contacts with extension agents farmers, educational level and income of farming with the application of integrated pest management (IPM) approach is carried out t test as told Anto Dajan (1991) as follows:

$$t = r^2 \sqrt{\frac{n-2}{1-(r_s)^2}}$$

t = distribution value
rs = correlation coefficient
n = number of samples

From the calculation, the decision on the level of 95% with degrees of free (db) = (n-2) are as follows :

Ho : If $t_{Countdown} < t_{table}$, meant there was no significant correlations between land use, farm experience, frequency of contact farmers with extension agents, education level of farmers, and farm income with the application of IPM technologies.

H1 : If $t_{Countdown} > t_{table}$, there is a significant correlations between land use, farming experience, the frequency of contact farmers with extension agents, education level of farmers, and farm income with the application of IPM technologies.

RESULTS AND DISCUSSION

Socio-Economic Farmer Background

Farmers Respondents

Based on questionnaire results obtained, it turns out the average farmer age 41 years with a minimum age of 25 years and maximum age 51 years. This shows that all farmers are productive age, so are able to do the shallots farming. Based on the recognition of farmer respondents, that to cultivate shallotss required perseverance, precision and power activities more than other farm crops, so farmers in the productive age who have a passion for planting shallotss. For more details, circumstances such as age of farmer respondents listed in Table 3.

Table 3. Condition of Farmers Age of Respondents

No	*Strata Area (ha).*	*Farmer Age*			**Amount**
		25-33	34-42	43-51	
1.	< 0,25 ha	3	10	3	16
2.	0,25 - 0,50 ha	0	3	8	11
3.	>0,50 ha	2	5	3	10
	Amount	5	18	14	37
	Percent %	13,51	48,65	37,84	100,00

Source: Primary Data Analysis

Table 3. showed that the age of farmers is 13.51% of young age (25-33), 48.65% 34-42), and 37.84% from 43-51 years of age. This shows that all respondents are peasant farmers in productive age, so they will be able to carry out farming faced. This situation indicates that the population in the village of Pabuaran Kidul still care about the farm.

Farmer education level of respondents in general are still relatively low, mostly primary school graduates for 75.68%, 24.32% for junior high school graduates and more detail can be seen in Table 4 following.

Table 4. Farmers' Education Level of Respondents

No.	Level of education	Total (life)	Percent (%)
1.	Primary School (SD)	28	75,68
2.	Junior High School (SMP)	9	24,32
	Amount	37	100,00

Source: Primary Data Analysis

Education is expected to affect the respondent in carrying out their agribusiness. Higher education will have the knowledge and insight into the broader, so the openness with the outside world more widely as well. In line with the opinion A.T. Mosher (1981) in Mubyarto (1988), that the education of the population is one of facilitator in the learning process to adopt an innovation. Thus, farmers will more easily allow for new information and adopting innovations that have been there in an attempt to reform their agribusiness.

Farmers' experience of respondents in the study area farming mostly over 10 years experience as many as 27 people (72.97%), farmers farming respondents experienced between 60-10 years as many as eight people (21.62%) and the remaining two people (5 , 41%) peasant farming respondents experienced between 0-5 years. Although low levels of farmer education, it appears may not be a major problem, because they have a long experience in farming. More detail can be seen in Table 5.

Table 5. Respondents in a farmer's experience farming

No.	Farm Experiences	Total (life)	Percent (%)
1	0 - 5 year	2	5,41
2	5 - 10 year	8	21,62
3	> 10 year	27	72,97
	Amount	37	100,00

Source: Primary Data Analysis.

Experience is one factor that determines success in farming, because of past experiences a person can influence the work that is now done. This relates to the risk of farm failures. Regarding the duration of the different experiences among the respondents will also influential in running their agribusiness. Farmers influential older pages will know more about the situation and conditions facing farming. so the success or failure in the past can be used as benchmarks in implementing better farming.

Cultivated land area farmer respondents in the study area range from 1000 -7500 m^2. The results were obtained most of the farmers cultivated land area of the respondents had ≤ 0:25 ha as many as 15 respondents (40.54%), cultivated land area larger than 0.25 ha - 0.50 ha as many as 12 people (32.43%) and the respondent farmers who have cultivated land area> 0.50 ha as many as 10 people (27.03%). More detail can be seen in Table 6.

Table. 6. Land Area Farmers' Respondents

No.	Land Area Farmers'	Total (life)	Percent (%)
1.	< 0.25 ha	15	40,54
2.	0,25 ha - 0,50 ha	12	32,43
3.	> 0.50 ha	10	27,03
	Amount	37	100,00

Source: Primary Data Analysis

Tarya J. Suganda (1981) says farmers with a narrow area of land ownership that many experience obstacles, if faced with the use of new technologies, such as rice farming technology. Narrow area of land plots will lead to small farmers' income, so as to meet the needs of food usually seek land for the purpose of short-term and more intensive, regardless of the suitability of the land capability.

Farmers' Income

Shallots farm income level is largely determined by the land area cultivated, and shallots prices are on the season. Based on the data obtained, it turns out the farmer's income from business shallot average of more than Rp. 43.400.000,-/ ha with an average cost reaches Rp27.800.000,-/ha for once planted, so that only farmers who have large capital it is capable of conducting the business of shallot plants. Lowest income farmers, namely Rp. 3.225.000,- an area of 1000 m^2 of land plots, and the largest revenue reached Rp32.550.000,- an area of 7500 m^2 plots. This shows that the more widely Land Area Farmers' higher incomes earned by farmers. In addition, shallot farmers' income level is also influenced by the price of shallots in that season. In general, prices of shallot on the season reaches Rp.4.000, - up to Rp 4500, - / kg so that the price farmers earn higher incomes.

Contacts With Extension

Through meetings with extension staff and farmers group planned intensities are expected to help change the knowledge of farmers and farmer groups to increase cooperation in dealing with such problems in the shallots crop pest control. Based on the results obtained that the contact farmers by extension officers during one growing season only 1-2 times, and most of the farmers, namely 70.27%, only experienced once in contact with counselors during the growing season (Table 7). This is due mostly farmers understand how to control the pest plant shallots, shallots and age of the plant is short only ± 60 days with the intensity of maintenance is very intensive, causing a lack of farmers' contact with extension agents.

Table 7. Contact Frequency Extension

No	Strata Area (ha).	Contacts with extension agents (times) 1	2	Amount
1.	< 0,25 ha	13	2	15
2.	0,25 - 0,50 ha	7	5	12
3.	>0,50 ha	6	4	10
	Amount	27	13	37
	Percent (%)	70,27	29,73	100,00

Source: Primary Data Analysis

Level of Technology Implementation of IPM at the Shallot Plants

The results showed that the average farmer respondents in the application of IPM technologies is still low - moderate, and generally a well-implemented IPM technology is an extensive farmer work capacity reached more than 0.25 ha. According to farmers they are not willing to bear the risk of failure due to pest attack, so in control they are still many who stuck with excessive use of pesticides.

Table 8. Level of Implementation of IPM

No	Strata Area (ha).	Level of Implementation of IPM low (<5)	Medium (5-10)	High (>10)	Amount
1.	< 0,25 ha	15	0	0	15
2.	0,25 - 0,50 ha	6	5	0	11
3.	>0,50 ha	1	8	2	11
	Amount	22	13	2	37
	Percent (%)	59,46	35,13	5,41	100,00

Source: Primary Data Analysis

Correlation farmer Socio-Economic factors and the application IPM of Farm Shallot

Correlation Education Level and application of IPM Technology of farm Shallot

Educational influence on changes in attitudes, reasoning power and capabilities. Education which is discussed in this study represents a formal education. Education level of respondents who are involved in program implementation Shallots IPM technologies in the Village of Pabuaran Kidul is largely complete primary school. Results average score based on the level of implementation of IPM technology, education level of farmers is as indicated in Table 9.

Table 9. Level of application of IPM Farmer Shallots Based Education

No.	*Education Leve*	*Total Soul*	*Average Score*	**Implementation of IPM (%**
1.	Primary School (SD)	28	3,80	25,60
2.	Junior High School (SMP)	9	6,78	45,20
3.	Upper Secondary School (SLTA)	-	-	-
	Amount	37		

Source: Primary Data Analysis

Based on the calculation of Spearman Rank Correlation test statistics, obtained value rs = 0.486 (medium). This means there is the relationship between educational level with the application of IPM technologies shallots registration 0.486. Furthermore, the t test results showed that $t_{Countdown} > t_{table}$ is 3.294 > 2.030 on the real level 5%, meaning that between the education level of farmers with the application of IPM technologies shallots plants have a real relationship. This shows that the higher the education level of farmers will be followed by a better implementation of IPM as well, because the level of education affect the power of reason, and adoption of new technologies. In accordance with the opinion Oemar Hamalik (1995), that learning is done by a person will result in changes in attitudes and behavior as a whole as a result of individual experience in interacting with their environment

2. Farmers Experience relations with IPM Technology Application of farm shallot

Farming experience is one aspect that can affect the level of business success. The longer the experience of farming are experienced farmers, so they will be able to reduce the risk of failure in farming. Level of implementation of IPM technologies based on Farmers Based on Experience can be seen in Table 10.

Table 10. IPM adoption level Shallot Farmers Based on Experience

No.	*Experience Level*	*Total Soul*	*Average Score*	**Implementation of IPM (%)**
1.	0 -5 years	2	4,50	30,00
2.	6 - 10 years	8	4,37	29,13
3.	11 - 15 years	12	4,08	27,20
4.	> 15 years	15	5,06	33,73
	Amount	37		

Source: Primary Data Analysis

Based on the calculation of Spearman Rank Correlation test statistics, the value rs = 0.260 (weak). This means that there is a link/weak correlation between the level of experience with the application of IPM technologies for plant shallots 0.260. Furthermore, the t test results showed that $t_{Countdown} < t_{table}$ namely 1.590 <2.030 on the real level 5%, meaning that between the level of farmers' experiences with the application of IPM technologies shallots plants there is no real relationship.

It was found that the more experienced in farming, was not followed by the application of IPM technologies. This suggests that the experience of farmers in farming shallots did not affect the farmers in the implementation of IPM, because generally shallots very risky crop to pest attack. Pests often attack plants like shallots leaves or silkworm caterpillar pests grayak, so that the farmers rely on pesticides pest control without regard to other control aspects. Farmers' experience of respondents generally said that without the use of pesticides would be fatal and can thwart the harvest. This is in accordance with the opinion of Prasetyani Eddy Tarman (1995), that controlling pests without pesticides will lose the harvest of about 45-100%, so the use of pesticides is the preferred method for controlling pests in shallots crop pest control.

Frequency of Contact Farmers and relationship with Application of Technology Extension IPM Shallots.

Counseling was done by an extension of the farmer/farmer group aims to change attitudes, skills, knowledge and farmer group cooperation. Through contacts between extension agents to farmers/farmer groups in the IPM, then an extension can inform you about the best IPM technologies by farmers. The result of the implementation of IPM score level based on the shallots crop in contact with agricultural extension officers can be seen in Table 11

Table 11. Level of Technology Implementation Based on the frequency of contact with the IPM Extension

No	*Contacts With Extension*	*Total Soul*	*Average Score*	**Implementation of IPM (%)**
1.	1 times	26	2,61	17,40
2.	2 times	11	9,18	61,20
	Amount	37		

Source: Primary Data Analysis

Based on the calculation of Spearman Rank Correlation test statistics, the value r_s = 0.555 (medium). This means there was a relationship/correlation is between the contact farmers with extension agents in IPM extension with the application of IPM technologies for plant shallots 0.555. Furthermore, the t test results showed that $t_{Countdown} > t_{table}$ is 3.949 > 2.030 on the real level 5%, meaning that between contact farmers with extension agents in IPM extension with the application of IPM technologies shallots plants have a real relationship. This showed that extension contacts with farmers in IPM extension was followed by the application of IPM technologies by farmers.

Planted Area Relationships Shallots IPM Technology Application

Land farming was one key element of the production factors have great influence on the use of technology. Results The average score of the level of application of IPM technologies based on shallots crops cultivated land area of shallots can be seen in Table 12

Table 12. Based on the level of IPM Technology Application Area

No	*Strata Area (ha).*	*Total Soul*	*Average Score*	**Implementation of IPM (%)**
1.	< 0,25 ha	15	2,73	18,20
2.	0,25 - 0,50 ha	12	4,25	28,33
3.	> 0,50 ha	10	7,70	51,33
	Amount	37		

Source: Primary Data Analysis

Based on the calculation of Spearman Rank Correlation test statistics, the value $rs = 0.815$ (very strong) It means there is the relationship very strong correlation between the total area planted with shallots with the application of IPM technologies for plant shallots 0.815. Furthermore, the t test results showed that $t_{Countdown} > t_{table}$ ie 8.320> 2.030 on the real level 5%, meaning that the total area planted with shallots with the application of IPM technologies shallots are a real relationship. This shows that the total area planted with shallots was followed by the application of IPM technologies by farmers. According to Faisal Kasryono (1984), that the vast farm land ownership tends to increase productivity through technological change their agribusiness.

Correlation Farmers' Income Level and application IPM Technology of farm Shallots

Farmers' income is cash receipts (profits) from the value of agribusiness. Overall, farmers' income level was around Rp 3.225.000,- to Rp 32.550.000,-, - with an average of Rp 12,689,651, - once the planting season. However, farmers' income is affected by many factors such as cost of production (especially the price of seeds), the price of shallots during harvest, the land area cultivated, and its production, because these factors are always changing every season.

Based on the calculation of Spearman Rank Correlation test statistics, the value $r_s = 0.796$ (strong). This means there is a strong correlation between income levels in farming shallots with the application of IPM of 0.796. Furthermore, the results of t test calculation shows that $t_{Countdown} > t_{table}$ ie 7.787 > 2.030. the real level 5%, meaning that between the level of farmers' income with the application of shallots IPM technologies have a real relationship. According to Herman Soewardi (1972), that revenue can be a stimulus for farmers to improve their agribusiness. The bigger the farmers' income, the higher the ability of farmers to manage their agribusiness capital.

CONCLUSION

It can be concluded that Level education, contacts with farmer extension agents, farmers' income area and the planting of shallots has a real connection with the application of integrated pest control (IPM) shallots plants. Whereas the level of experience of farmers who grow shallots have no real connection with the application of integrated pest management (IPM) shallots plants.

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