

## Factors That Influence Farmer's Adoption of Citrus GergaLebong Technology in Bengkulu Indonesia

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### Abstract:

*The adoption technology influenced by internal dan external factors. The internal factors included knowledge, skill, the education level, farmer age, farming activities, and the external factors are the distance to the supplies production market, the distance to the field, price of product, and transportation. Citrus agribusiness development in Lebong is certainly supported by the role of stacholder and citrus farmers, as well as the proper dissemination of methods. Adoption process in the extension can be interpreted as the changes of behavior process such knowledge (cognitive), attitude (affective), and skill (psycho-motoric) in a person after the received "the innovation" from extension worker by target communities. The outputs of this study were: 1)to analyze the factors that influenced farmers' adoption; 2) to analyze the effectiveness of field day method in improving farmers' cognitive and affective ability; 3)to know the relationship between the knowledge and the adoption level of the farmers. The methods of this study were field day and survey to 76 respondents with the structured questionmaire by deep interview in Rimbo Pengadang Sub District, Lebong Regency in 2014. Data analysis was done by descriptive and statistical parametric methods (multiple linear functions). The results showed that: 1) The factors that influence farmers' adoption level toward PTKJS are the internal factors such as: education, knowledge, training intensity, and the external factors like: distance from home to field farming, distance from home to production supplies store; 2) The field day method was effective in improving the farmers' knowledge (23.17%) and the farmers' affective ability in the cultivation of citrus RGL is positive with the score of 4.03; 3)The identification of the adoption level shows that there is a very close and positive relationship between farmers' knowledge level and farmers' adoption level about PTKJS innovation.*

**1. Keywords:** Adoption of technology; Affec; Citrus gerga; Effectiveness dissemination

### 2. Introduction

The adoption in the extension process means a process the change of the behavior: cognitive,

affective, and psycho-motoric on someone after the innovation is received from the extension worker to their target. They do not only receive the knowledge, but they also apply and implement it in their farming activities. The innovation usually receives direct and un-direct by the other people, it is as a reflection from changing the attitude, knowledge, and their skill [1].

One of citrus kind that developed in Bengkulu Province is a RGL citrus that it is a superior commodity. RGL citrus had some superiority: orange-yellow fruit color, every year production, big fruit's size: 200 – 350 gram, high of fruit juice value, and have of potentially market. RGL citrus produce once years, each tree consists 4 to 6 generation, there is has flower, young fruit, and mature fruit (Suwanto, 2010). Since 2011, the Horticultural Directorate General was established the RGL citrus as a national priority to the development of citrus agribusiness area until 6.000 ha in next 5 years.

RGL citrus can become a superior product of the local or national horticultural and it has a chance to be one of some national priority product because market of RGL citrus was opened. The cultivating of RGL citrus will be success by some factors: the farmers' spirit on cultivation, citrus seed from the Government, training, extension. Beside those, applying the technology with the farmers' adoption is also an important role in improving production and citrus quality. On the citrus center development area in Indonesia, the IAARD on early 2000' was developed research and assessment program of citrus technology implementation and it is known as PTKJS or the Integrated Management of a Healthy Citrus Farm (Supriyanto et al. 2003). The cultivation through PTKJS approach is needed to be widely disseminated in order to accelerating the technology adoption in Lebong Regency.

An acceleration strategy of RGL citrus dissemination is needed in order to support the development of Citrus agribusiness area in Lebong Regency. The development of citrus agribusiness area in Lebong Regency is certainly needs a support from stakeholders and citrus farmers, also an accurate dissemination method. The problem is all about perception of citrus farmers toward RGL citrus farm development. That perception is needed as a first step of development on citrus agribusiness area and technology adoption in Lebong Regency. The adoption of technology based local-specific is affected by internal factors and farmer perception toward a characteristic of technological innovation. The internal factors consist of farmers' formal education, farming experience, land area, and provision of production tools. Mean while, the innovation characteristic that affected are relative profit, compatibility, complexity, triability and observability.

An increasing of farmers' behavior through agricultural extension agents support is one of strategy to accelerating the technological transfer of RGL citrus cultivation with PTKJS approach local-specific based to users, one of effort that is taken with learning process through agricultural extension. The effectiveness of agricultural extensions agents is determined by components of its system, amongst are agricultural extension agents method. The effective method should be selected and determined based on target characteristics, resources owned, material, and objectives to be achieved. It is not an easy task to make the same perception and knowledge about PTKJS amongst researchers in Balitjestro, BPTP, BPP and staff from other related departments/agencies. Without same knowledge about PTKJS, this technology package will be difficult to delivered to the farmers. In other word, before we expect that the citrus farmers adopting PTKJS, ideally the researchers in BPTP and agricultural extension agents in the field as a carrier of technology already knew it very well. Therefore, the research about knowledge and level of farmers' adoption needs to be done. The objectives of research : 1) to analyze the effectiveness of field day method in improving farmers' cognitive and affective ability; 2) to know the relationship between the knowledge and the adoption level of the farmers; 3) to analyze the factors that influenced farmers' adoption towards citrus technological innovation.

### 3. Methodology

This research was conducted on May to October 2014 in Rimbo Pengadang Sub district Lebong Regency. This research was done through implementation of field day method and survey about the level of adoption. To know the effectiveness of dissemination method in increasing the farmers' cognitive and affective abilities, the respondents' cognitive and affective measurement was done before and after the implementation of extension's activities method and dissemination (field day) on October 2014 consisting of 40 respondents, however the level of adoption and its factor affected was done within survey method using structured questionnaires toward 36 respondents on Mei - August 2014. This research used purposive sampling which has criteria of respondent such as citrus farmers that already receive the technology innovation from BTPTP. The primary data were collected with the characteristic of farmers, level of knowledge data, adoption data and cosmopolite.

The farmers' cognitive toward RGL citrus cultivation technology with PTKJS approach can be seen from 4 indicators, such as (1) CVPD disease and handling, (2) watering, (3) fruit thinning, and (4) harvesting. The farmers' affective can be seen from 6 indicators, such as (1)The PTKJS benefits in resolving the diseases and pests of plants, (2) the conformity of PTKJS with environment / local condition, (3) the use of PTKJS for increase citrus' production, (4) the easily implementation of PTKJS in the field, (5) the conformity of PTKJS with a local culture, (6) the conformity of PTKJS implementation with farmers' capital availability.

The farmers' cognitive and affective abilities toward RGL citrus cultivation with PTKJS approach was be analyzed using descriptive statistics and class interval, each questions can be divided in to 5 scores: 1 (extremly not knowledgeable); 2 (not knowledgeable); 3 (knowledgeable enough); 4 (knowledgeable); dan 5 (very knowledgeable). According to Nasution and Barizi in Rentha. T (2007), the class interval for each indicator can be determined by:

$$NR = NST - NSR \quad \text{and} \quad PI = NR : JIK$$

Where:

NR	:	The range of the score
NST	:	The highest Score
NSR	:	The lowest Score
PI	:	Interval Lenght
JIK	:	The number of Interval Class

The increase of the farmers' cognitive ability after the implementation extension method was analyzed by the Statistik assessment of Paired Simple T Test by formula of Riduwan dan Alma. B [2].

$$T = \frac{D}{\left[ \frac{SD}{\sqrt{N}} \right]}$$

Where:

T	:	Tcalculate
D	:	Measurement's mean 1 and 2
SD	:	Measurement of standart deviation 1 and 2
N	:	The number of sampling

To know the farmers' adoption toward the implementation of the Integrated Management of a Healthy Citrus Farm (PTKJS) component, was calculated from the adoption level (TA). It is multiplication of the adoption value (KA) and the adoption intensity (IA), as described in this formula :

$$TA = KA \times IA$$

The relationship between the knowledge level and the adoption level was analyze by the Pearson Correlation of SPSS. Where as to know the factors influencing the adoption were analyzed by a multiple linear function approach:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_6 X_6 + U_i$$

Where:

Y	=	the adoption levels (%)
X <sub>1</sub>	=	the respondent's age (years)
X <sub>2</sub>	=	the respondent's education (years)
X <sub>3</sub>	=	the distance from the house to citrus farm/garden (meters)
X <sub>4</sub>	=	the distance from the house to agricultural supplies store (meters)
X <sub>5</sub>	=	the cognitive respondent or knowledge about citrus cultivation (%)
X <sub>6</sub>	=	the Intensity of citrus cultivation training (time)
U <sub>i</sub>	=	error term
β <sub>0</sub>	=	constanta
β <sub>i</sub>	=	coefficient parameters

## 4. Result and Discussion

### 4.1. The Farmers' Characteristics

According to Schuller dan Rogers, the farmers' adoption of citrus RGL by PTKJS in Lebong is strongly determined by their knowledge. The result of the survey showed the farmers' education in RimboPengadang Sub-District, Lebong Regency is low (Table.1), so their perception toward the technology innovation is also low.

The farmers started planting the citrus after they looked at the success of Mr. Gerga and Maharani's citrus farm, and they also got citrus seeds from the government. From the empirical evidence, it shows that the citrus technology implementation, especially PTKJS, will also result in the same success story. The Mardikanto's opinion (1996)[1] in the adoption of extension process means a behavior change process, such as: someone's knowledge (cognitive), attitude (affective), as well as skill (psycho-motoric) after receiving "innovation" which is delivered by extension officers to the target. The "receiving" is not only "knowing", but also being able to implement or apply it to their farming life.

Seventy-four percent of the labors as the main production factor in citrus farming are at productive ages (21-50 years old). According to Rusli [3], a productive labor is someone around 15-64 years old. This becomes a supporting factor in the farming of

citrus RGL development in Lebong Regency. According to Mardikanto(1993), this age will affect someone's maturity level (both physical and emotional maturity). Age also affects a person's capacity of learning. Generally, someone's capacity of learning grows fast when she or he is 20 years old and it becomes slower when they are 50 years old (Dahama and Bhatnagar in Mardikanto 1993). The opinion of Cruz in Choirotunnisa, et al (2008) [4] is young and inexperienced farmers have a bigger possibility of receiving new ideas. The younger farmers can leave the old method easily, so they can change from one system to another system quickly.

The farmer's education level is divided into 4 groups: Primary School (PS), Junior High School (JHS), Senior High School (SHS), and Bachelor's Degree. The majority of their education levels are PS (47.50%), SHS (35.00%), JHS (15.00%), and dan Bachelor's Degree (2.50%) as in (Table.1).

Number	Descriptions	Minimum	Maximum	Average
1	Age (year)	20	70	41.14
2	Formal Education (year)	6	12	10
3	Citrus Field Area (ha)	0.5	3.5	1.5
4	Plant's age (year)	1	3.5	1.6
5	The number of dependent family (people)	1	7	3

Source: the primary data tabulated

**Table 1:** The Sample of Farmer's Characteristics in Lebong Regency in 2014.

The farmer's formal education level determines the human resources quality. The higher the formal education level, the better and more rational the way of thinking. The education level is a learning tool to improve the knowledge, the cognitive ability and the farmer's ability of technology adoption. The education level is one of the indicators of the farmers' activity in their groups because generally if someone has a higher formal education level. it will be easier for them to join some activities. This opinion is supported by a perception that adult farmers have a better self-concept and learning experience. They are ready to learn things so that their human side and learning process are visible (Apps in Sadono D. 2008).

**4.2. The Effectiveness of Dissemination Method (field trip) toward the Farmers' Cognitive and Affective Abilities in Citrus RGL Farming Technology by PTKJS Approach**

The effectiveness of agricultural extension is determined by the components in agricultural extension system such as agricultural extension method. The effective method must be chosen and determined according to the target's characteristic, resources owned, materials, and the goals to be achieved. The choice of effective extension method is expected to improve the farmers' knowledge, attitude, and skill toward the citrus RGL farming technology (BPPSDMP.2010) [5].

**4.2.1. The Farmers' Cognitive Abilities in Citrus RGL Technology Cultivation by PTKJS Approach**

This assessment result showed that the farmers' cognitive abilities after the field day was applied increased 23.17% from 3.28 to 4.04 (Table.2).and it showed that the farmer's ability of citrus RGL farming technology is better than before. If we reach

each indicator. the highest increase of the farmers' cognitive abilities is CVPD disease control (41.85%).

followed by harvesting (25.51%. fruit thinning (18.21%). and watering (11.84%).

The Technology components of Citrus RGL with PTKJS approach	Cognitive Farmer's Score	
	Before	After
CVPD disease and handling	2.70	3.83
Watering	3.54	3.96
Fruit thinning	3.46	4.09
Harvesting	3.41	4.28
Total	13.11	16.16
Average	<b>3.28</b>	<b>4.04</b>

Source: The primary dat

**Table 2:** The farmers' Cognitive Abilities of the Citrus RGL Farming Technology by PTKJS Approach in Lebong in 2014.

Where:  $1.00 \leq x \leq 1.80 = \text{very low}$   
 $1.80 < x \leq 2.60 = \text{low}$   
 $2.60 < x \leq 3.40 = \text{medium}$   
 $3.40 \leq x \leq 4.20 = \text{high}$   
 $4.20 \leq x \leq 5.00 = \text{very high}$

Based on table 2 the data will be analyzed by paired simple t test like as table 3. The criteria of the farmer's cognitive abilities toward the CVPD disease control was medium (2.70), and after the implementation of field day, the criteria increased to high criteria (3.83). The criteria of harvesting was high (3.41), and it increased to very high criteria (4.28). The result showed that a field day method is effective to deliver the information about PTKJS technology. The field day was done by discussing the topic/material, demonstrating how to handle CVPD

disease, how to water, how to do fruit thinning, and handling accurate harvest. The field day method gives benefit for the farmers and it is a suitable method for the farmers' characteristics such as the farmers' various education and age.

After field day, the farmers' cognitive abilities showed the significant difference by Paired Simple T Test (**Table.3**). It means that the extension by field day can increase the farmers' knowledge about citrus cultivation technology by PTKJS approach.

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before – after the field day	-16.70225	13.53110	2.13946	-21.02971	12.37479	-7.807	39	.000

Source : The primary data calculated

**Table 3:** The farmers' cognitive Condition before and after Extention Method in Lebong in 2014.



If we look at the chart (Figure 1), the increase of farmers' cognitive describe about their consciousness to search and receive the technology innovation.

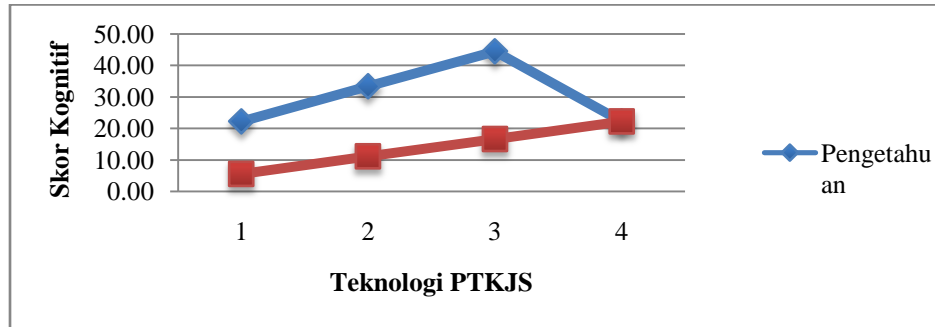


Figure (Chart) 1: Graph of the farmers' cognitive improvement in citrus RGL cultivation by PTKJS approach.

The success of citrus RGL cultivation is not an easy thing to achieve. The problem which is often faced by the farmer is how to apply the technical culture accurately. The education which was relatively low is sump once of the factor causing the farmers' limited thinking and it can influence their behavior. It is because a person's knowledge (cognitive) can affect the person's behavior and once of factors that influences the knowledge is someone's education. It cannot be refuted that if someone's education is high, it will be easier for the person to receive information, and in the end the person's knowledge will be higher. On the other hand, if someone has lower education, it may inhibit someone's behavior toward the way to receive information and new values which are introduced. (Simanungkalit in Mandias. 2012).

According to Notoatmodjo (2003) [6], the knowledge which is included in the cognitive domain

has six (6) stages: knowing, understanding, applying, analyzing, synthesizing, and evaluating. The knowing stage means someone can remember something learned previously and can recall all specific material or the object experienced. The understanding stage means the ability to explant about the object known. Therefore, there was an expression in the extension: I hear, I forget; I show, I remember; I try, I know; I try again, I understand.

### 5. The Farmers' Affective Abilities in Citrus RGL Technology Cultivation by PTKJS Approach

This research showed that the criteria of the farmers' affective abilities average is high with score 4.03 (Table.4). This shows that the field day method can give the farmers' positive attitude, so the farmers like the PTKJS innovation.

No.	Description	Score of the Farmer' Affectiv	Criteria
1.	The PTKJS benefits in resolving the diseases and pests of plants	4.33	Very high
2.	The Conformity of the PTKJS with environment/ local condition	4.30	Very high
3.	PTKJS benefits for increasing citrus production	4.25	Very high
4.	The easily implementation of PTKJS in the field	4.15	High
5.	The Conformity of the PTKJS with local culture	3.83	High

6.	The Conformity of the PTKJS implementation with the farmers' capital availability	3.33	Moderate
	Average	4.03	High
Source: Primary data calculated			

**Table 4:** The Farmers' Affective Abilities in Citrus RGL Technology Cultivation by PTKJS Approach in Lebong Regency at 2014.

Where:  $1.00 \leq x \leq 1.80$  = very low;  
 $2.60 < x \leq 3.40$  = moderate;  
 $4.20 \leq x \leq 5.00$  = very high;  
 $1.80 < x \leq 2.60$  = low;  
 $3.40 \leq x \leq 4.20$  = high;

(Table.4) shows that the category of the farmers' affective ability average is high. One of six indicators about PTKJS (capital) is moderate category and the others are high and very high. The farmers' attitude (affective) is in the stage of adoption innovation process. In this stage, the farmers start to be interested in the new knowledge. It is characterized by determining something new, considering what it is, finding how to do it by themselves. After they get the information, they start to consider how to apply it by themselves. The farmers will describe the innovation well and accurately and then they agree to like it or not.

From the six (6) indicators of the farmers' affective ability, only the conformity of the PTKJS implementation with the farmers' capital availability is on a moderate category. Although the farmers want the PTKJS innovation, the capital availability is one of the considerations for the farmers to adopt it. The government's role and their contribution to the easier farmers' capital access can become the solution, so that the PTKJS technology for the farmers can be adopted quickly.

The accurate dissemination of PTKJS local specific technology is very needed to accelerate the PTKJS technology adoption. The farmers' participation in the acceleration of innovation dissemination process is very important, such as the local farmers' participation as a self-help extension. They are agents of innovation technology dissemination in Lebong Regency. That is the

same as Rolling's opinion (1988) and Pretty (1995) in Indraningsih (2011) [7], that is the extension approach in the past era only focused on the technology transfer from the extensionists (read: the government by some development projects) to the farmers. That caused many failures and problems for the farmers.

### 6. Correlation between knowledge and adoptions score of technology with PTKJS approach

The innovation adoption is a farmer's mental process or behavior changes such as the knowledge (cognitive abilities), attitude (affectitive abilities), or skill (psychomotoric) of someone since they know the innovation until someone decides to receive and adopt the innovation (Rogers and Shoemaker.1971) [8]. This definition shows that the adoption process with the innovation introduced to the farmers will change their mentality to receive or reject it. Someone's cognitive ability can influence people to receive and adopt the innovation/ introduction technology.

The result shows the relationship between the farmers' knowledge and adoption level of PTKJS' components in (Table.5). The (Table 5) shows that the farmers with deep knowledge do not always adopt the suggested technology or the farmers' adoption level is still low.

Number of Respondent	Knowledge level		Adoption level	
	%	Category	%	Category
1	22.22	not good	5.56	Low
2	33.33	not good	11.11	Low
3	44.44	not good	16.67	Low
4	22.22	not good	22.22	Low
5	38.89	not good	22.22	Low
6	55.56	Good	22.22	Low
7	83.33	Good	33.33	Low
8	72.22	Good	33.33	Low
9	61.11	good	33.33	Low
10	44.44	not good	33.33	Low
11	66.67	Good	38.89	Low
12	66.67	Good	38.89	Low
13	66.67	Good	38.89	Low
14	50.00	not good	44.44	Low
5	88.89	Good	44.44	Low
16	66.67	Good	44.44	Low
17	88.89	Good	44.44	Low
18	83.33	Good	44.44	Low
19	100.00	Good	44.44	Low
20	88.89	Good	50.00	Low
21	72.22	Good	50.00	Low
22	77.78	Good	50.00	Low
23	94.44	Good	55.56	High
24	61.11	Good	55.56	High
25	83.33	Good	55.56	High
26	83.33	Good	61.11	High
27	77.78	Good	61.11	High
28	77.78	Good	61.11	High
29	77.78	Good	61.11	High
30	77.78	Good	66.67	High
31	88.89	Good	66.67	High
32	94.44	Good	72.22	High
33	83.33	Good	72.22	High
34	88.89	Good	77.78	High
35	83.33	Good	77.78	High
36	94.44	Good	83.33	High

Source : primary data calculated

**Table 5:**The Knowledge Level and the Adoption Level of Respondent toward PTKJS Component in Lebong Regency at 2014.  
If the condition in (Table.5) is described with the variance correlation between the knowing and adoption level by PTKJS, it will be:

Knowledge level	Adoption level	
	High	Low
Good	14	15
Not good	0	7

It shows that 15 farmers have high knowledge, but they do not have an adoption level or they have a low



adoption level. This describes that if the knowledge is high; it is not followed by the adoption of the new innovation.

Chi Square ( $\chi^2$ ) test is used to know if the farmers' cognitive ability is correlated with the farmers' adoption of PTKJS (Table.6).

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.530 <sup>a</sup>	1	.019		
Continuity Correction <sup>b</sup>	3.685	1	.055		
Likelihood Ratio	7.946	1	.005		
Fisher's Exact Test				.029	.020
Linear-by-Linear Association	5.376	1	.020		
N of Valid Cases <sup>b</sup>	36				

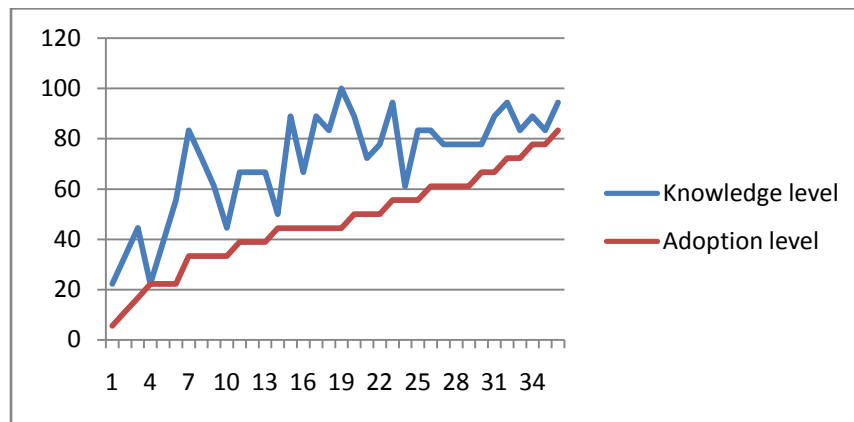
Source : Primary data calculated

**Table 6:** The result of  $\chi^2$  test of the correlation between farmer's knowledge or cognitive ability and PTKJS's adoption level in Lebong Regency 2014.

(Table.6) shows that the farmers' cognitive ability of PTKJS technology is significantly and positively correlated with the farmers' adoption value. The knowledge level is always higher than their adoption level. This describes that without the sufficient knowledge, the farmers cannot adopt the PTKJS technology well. In other words the adoption

technology without sufficient knowledge is difficult to apply.

Chart (Figure 2) shows that the farmers' cognitive ability is always higher than the adoption level. However, this result shows that the high farmers' cognitive ability is not followed by the high adoption level.



**Figure (Chart) 2:** The correlation between farmers' knowledge or cognitive ability and PTKJS's adoption level in Lebong Regency 2014.

## 7. The Factors Influencing the Technology Adoption of PTKJS

The farmers' technology adoption toward PTKJS depends on many things such as the farmers' condition (the internal factor) and the influence of their environment (the external factor). To analyze the factors influencing the farmers' adoption level toward PTKJS, the multiple regression models, with Y as a dependent variable, is used. Xi variables are the internal factors (knowledge, age, education) and the external factors (the distance from home to the field, and home to the production supply store, the extension intensity). The result of this analysis is as in (Table. 7).

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
	1.595	1.792		.890	0.381		
Age	0.229	0.157	0.194	1.461	0.155	0.562	1.780
Education	0.360	0.138	0.330	2.610	0.014	0.618	1.618
The distance from home to field	-0.086	0.039	-0.232	-2.213	0.035	0.897	1.115
The distance from home to production supplies store	-0.108	0.043	-0.262	-2.498	0.018	0.901	1.110
Knowledge	1.538	0.346	0.520	4.443	0.000	0.722	1.384
Training	0.169	0.096	0.225	1.754	0.090	0.601	1.665
R square	0.713						
F hitung	12.01						
Dependent Variable: Adoption level							

**Table 7:** The Result of Multiple Regressions of the Factors that Influence the Adoption Level of PTKJS Innovation in Lebong Regency 2014.

Mathematically it is written:

$$Y = 1.60 + 0.23X_1 + 0.36X_2 - 0.09 X_3 - 0.11 X_4 + 1.54 X_5 + 0.17 X_6 + 1.79$$

(Table.7) shows that the independent variables ( $X_1$  until  $X_6$ ) altogether significantly influence the dependent variables (the adoption levels) of PTKJS innovation. From 6 of the independent variables, 71.3 % influence the farmers' adoption level, whereas 29% are influenced by the factors out of the model. The coefficient regression of respondents' education ( $X_2$ ) significantly influences the adoption level of PTKJS technology. The adoption is a mental process to apply the technology innovation with some considerations to decide whether or not the new technology should be adopted. These considerations need knowledge and intelligence obtained from the education. As a result if the farmers' education is higher, the adoption of the citrus cultivation technology is higher too. According to Bandolan (2008), the farmers' adoption of rambutan in

Romangloe showed that the education level was very much influenced by the technology received. Similar to that, Drakel (2008) stated that the education level influenced the way of thinking toward the innovation response and changes. These respondents are easier to receive the new innovation. The farmers at productive ages with various education levels are expected to help each other so the group dynamics can work well [9-10].

The variable of the distance from home to the field ( $X_3$ ) significantly influences the PTKJS technology adoption. The farther the distance from the field is, the lower the adoption level is too. The distance from the house to the field is around 1.5 km, and the road condition is bad too. If the distance to the production supply store is 1 unit farther, the

farmers' adoption level will decrease 0.11 units. This condition will influence the technology adoption because it will be difficult for the farmers to get the fertilizer and pesticides as recommended. Because the plants do not produce anything yet and the family's income is not enough, it decreases the farmers' purchasing power toward the cultivation input.

The variable of knowledge about PTKJS technology innovation ( $X_5$ ) significantly influences the adoption level of PTKJS technology. With the assumption that the other independent variable is stable, if the respondents' knowledge increases 1 unit, the adoption level will increase 1.54 units. The training intensity variable of PTKJS technology ( $X_6$ ) also significantly influences the adoption level of PTKJS technology. The increase of the farmers' knowledge shows the farmers' awareness to search and receive the technology innovation information. It means the person who has high level of knowledge is the person who has high level of awareness. This statement is supported by the opinion that a farmer has a self-concept, learning experience, and readiness to learn (Apps in Sadono D. 2008), so the human side and learning process need to be put forward [10-15].

## 8. Conclusion

1. A field day method is effective in increasing the farmers' cognitive about 23.17 % and the farmers' affective ability in the cultivation of citrus RGL is positive with the score of 4.03.
2. The identification of the adoption level shows that there is a very close and positive relationship between farmers' knowledge level and farmers' adoption level about PTKJS innovation.
3. The factors that influence farmers' adoption level toward PTKJS are the internal factors such as: education, knowledge, training intensity, and the external factors like: distance from home to field farming and distance from home to production supplies store.

## 9. Suggestion

To improve the farmers' adoption level, the extensions' institutions are expected to provide more extension methods like: field day, technical assistance, training for the farmers and field agriculture officials. The external factors like the distance from a farmers' home to the field and the distance from farmers' home to the production

supplies store have a negative influence toward the farmers' adoption level of PTKJS innovation. To resolve the problems, the agriculture extension is in Lebong Regency can make it easier by making the written matrix of agricultural extension program (ProgramaPenyuluhan).

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