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RELATIONSHIP OF FARMERS CHARACTERISTICS TO THE LEVEL OF APPLICATION OF SOYBEAN PLANT TECHNOLOGY (*Glycine max* L. Merrill)

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Abstract

The characteristics of farmers are a picture that reflects the individual's situation in his life as a member of a farmer group, as the head of the family and as a member of the household, and also as a farming business actor in cultivating his arable land. The factors that support these characteristics include: age, level of education, farming business experience, area of arable land, and farmer income. The object of research is farmers with a population of 161 and a sample of 60 farmers who were became respondents, using quantitative methods and questionnaires as a tool to find out information from respondents. The data used are primary and secondary data. The analytical method used is the Spearman Rank correlation test simultaneously, and the Spearman Rank correlation test partially. The results showed that: (1) F-test results showed that the variables of age (X1), education (X2), farming business experience (X3), and land area (X4) were simultaneously related to the application of soybean plant technology (Y), with the value of F_{count} 75.981> from F_{table} 2.53 at the value of sig. of 0,000. The variables of age, education, farming business experience, and land area have a correlation value of 0.896, it means that there is a very strong relationship simultaneously to the application of soybean plant technology, (2) the test results on the partial relationship obtained results, namely: (a) The age variable has a partial relationship to the application of soybean plant technology, with the results of the analysis of T_{count}> T_{table} which is 6,610> 1,681 at sig.t 0,000, (b) Teh educational variables have a partial relationship to the application of soybean plant technology, with the results of the analysis of T_{count}> T_{table} which is 4,510> 1,681 at sig.t 0,000, (c) The farming business experience variable

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has a partial relationship to the application of soybean plant technology, with the results of the analysis of T_{count}> T_{table} that is 2.601> 1.681 at sig.t value of 0,000, and (d) The relationship between land area variables shows that the land area variable has a partial relationship to the application of soybean plant technology, with the results of the analysis of T_{count}> T_{table} which is 6.791> 1.681 at sig.t 0,000.

INTRODUCTION

Soybean (Glycine max L. Merrill) is one of the main food commodities after rice which has a high economic value, namely as a source of vegetable protein for human food needs. Some products produced from soybeans that can be consumed by humans include tempeh, tofu, soy sauce, tauji, beancurd, soy milk, food oil and soy flour. Soybean is also one of the most nutritious food commodities with prices that are affordable by all levels of society. In every 100 grams of soybeans contains 330 calories, consisting of 42% protein, 18% fat, 32% carbohydrates, and 8% water (Palawija Seed Development Center, 2012).

The development of soybean needs apparently cannot be matched by the increase rate of the National soybean production, so that the import figures are still continued to increase from year to year. This situation needs to get the attention of the government, because Indonesia is an agricultural country that has the potential for a fairly large amount of land and soybean plants that can be cultivated properly in Indonesia (Ministry of Agriculture, 2009). Data from the National Soybean Council said that domestic soybean consumption needs in 2011 were 2.4 million tons while the soybean production target in 2011 was only 1.44 million tons. There is still a lack of supply (deficit) of one million tons of soybeans. Soybean consumption which continues to increase rapidly each year is also in line with the increasing public awareness of nutrition which is marked by an increase in consumption per capita of soybeans by 5.55% (Central Bureau of statistics, 2011).

The low soybean production in Indonesia is caused by several factors including the unavailability of adequate irrigation, the dose of fertilizer that is not in accordance with the recommendations, crop maintenance, the determination of plant population and control of pests and diseases and also the ability of plants to absorb nutrients in the soil (Ministry of Agriculture, 2010).

Bakung Kidul Village is one of the soybean producing centers in Jamblang District. Based on Village Potential data of 2018, the level of soybean productivity in Bakung Kidul Village is 12.88 kw / ha, it still below the average of soybean productivity in Jamblang District which is 13.02 kw / ha. The productivity can still be increased, one of which is by expanding the planting area and increasing the adoption or the use of agricultural technology.

The characteristics of farmers are a picture that reflects the individual's situation in his life as a member of a farmer group, as the head of the family and as a member of the household, and also as a farming business actor in cultivating his arable land. Factors that support these characteristics include: age, level of education, farming business experience, area of arable land, and farmers' income (Rusidi, 2009). In Bakung Kidul Village, the age of the farmers is around 40-54 years with a number of farmers 160 people, the education of farmers in the Bakung Kidul Village is quite low because many farmers are only educated until junior high school so that farming knowledge and insights are still lacking, but the experience in its farming is quite a lot, because of the many educational programs provided from extension agents. Bakung Kidul

Village has an area of about 58 hectares of rice fields.

This research aims to determine the relationship between the characteristics of farmers (age, education, farming experience, arable land area) with the application of soybean plant technology.

METHODOLOGY

The research was carried out in Bakung Kidul Village, Jamblang District, Cirebon Regency. This research was conducted in November 2018 until March 2019 as the object of the research was farmers with a population of 161 and a sample of 60 farmers who were became respondents. The research design uses descriptive quantitative methods using a questionnaire as a tool to find out information from respondents (Syofian Siregar, 2017). Descriptive research method is a method in examining the status of a group of people, an object, a condition, and a system of thought or a class of events in the present. The purpose of this descriptive study is to make a systematic, factual and accurate descriptive, picture or illustration of the facts, properties, and relationships of the phenomenon under investigation. The data used are primary and secondary data. The analytical method used is the Spearman Rank correlation test simultaneously, and the Spearman Rank correlation test partially (Surakhmad, 1994).

RESULTS AND DISCUSSION

Relationship of Farmer's Characteristics to the Level of Application of Soybean Plant Technology Simultaneously

F-test results for variables of age, education level, farming business experience, and land area obtained from SPSS design version 24 Table 1.

Table 1. Results of F Test of Relationship of Farmer's Characteristics to the Level of Application of Soybean Plant Technology Simultaneously

ANOVA[a]						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	6938.314	4	1734.579	75.981	.000[b]

	Residual	1322.783	57	23.207		
	Total	8261.097	61			
a. Dependent Variable: the application of soybean plant technology						
b. Predictors: (Constant), age, education, farming business experience, land area						

The F test results show that the variables of age (X1), education (X2), farming experience (X3) and land area (X4) are simultaneously related to the application of soybean technology (Y).

The magnitude relation of age, education, farming experience, and land area which is simultaneously 0.896 is shown in Table 2.

Table 2. Correlation Test Results

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.896[a]	.840	.829	4.81733
a. Predictors: (Constant), age, education, farming business experience, land area				
b. Dependent Variable: the application of soybean plant technology				

From the table it can be seen that R of 0.896 shows that the relationship between variables of age, education, farming experience, and land area are simultaneously related to the application of soybean technology. It means that there is a very strong relationship simultaneously between variables of age, education, farming experience, and land area on the application of soybean plant technology. According to Sugiyono (2013) simultaneous test is to see whether the independent variables together have a significant effect to the dependent variable. In simultaneous testing, the influence of the two independent variables together will be tested to the dependent variable.

The same results have also been conducted by *Choirotunnisa*'s research (2008), there is a very significant relationship between age, formal and non-formal education with the level of application of integrated crop management models at 99% confidence level; and there is a significant relationship between income and experience with the level of application of integrated soybean crop management models at 95% confidence level. Research conducted by *Mohamad Ikbal* and *Muharja Hasan* (2014), titled the relationship between the characteristics of farmers and corn farming in Paguat District, Patilanggio District, and Buntulia District Pohuwato Regency, which has a very strong relationship based on the correlation coefficient *Kendall W* between 0.93 – 097.

Relationship of Farmer's Characteristics to the Level of Application of Soybean Plant Technology Partially

Multiple correlation analysis was carried out to find out the magnitude relation of several independent variables together to the dependent variable, in this research namely the variables of age, education, farming experience, and land area to the application of soybean plant technology. The following are the results of multiple correlation analysis using SPSS version 24:

Table 3. The Results of T-Test. Relationship of Farmer's Characteristics to the Level of Application of Soybean Plant Technology Partially

Coefficients[a]

Model		T	Sig.	Correlations		
				Zero-order	**Partial**	**Part**
1	(Constant)	2.318	.024			
	Umur	6.610	.000	.664	.649	.345
	Tingkat Pendidikan	4.510	.000	.651	.510	.236
	Pengalaman Usahatani	2.601	.013	.585	.331	.136
	Luas lahan	6.791	.000	.732	.681	.361

Source : Questionnaire Data (processed by SPSS)

Correlation Relationship between Age Variables (X1) with the Application of Soybean Plant Technology (Y)

The analysis shows that age has a partially significant relationship to the application of soybean plant technology. The magnitude of the partial relationship between age and the application of soybean plant technology is 0.649 (Table 3).

Based on the results of partial correlation test research on the age variable is very influential on the application of soybean plant technology, because the age of farmers that up to 50 years is more, so they have a lot of information about the application of soybean plant technology. According to Notoatmodjo (2003), the age influences someone's comprehension and mindset. As you get older you will increase and develop your comprehension and mindset, so that the knowledge you gain is getting better. According to Rogers (2003) the younger the farmers usually have a great enthusiasm for new things, so there is an impression that farmers are faster and responsive to renewal. Farmers' perceptions to the innovation are faster, more complete and objective than those of older farmers.

Research conducted by Choirutunnisa (2008) shows that the correlation between age and the level of application of integrated rice crop management models is negative and significant. It means that the younger the age of farmers, the level of application of integrated rice crop management models will be higher.

Correlation Relationship between Variable Educations Level (X2) with the Application of Soybean Plant Technology (Y)

The analysis results show that education has a partially significant relationship to the application of soybean

plant technology. The magnitude of the partial relationship of education to the application of soybean plant technology is 0.510 (Table 3). Based on the results of partial correlation test research to the educational level variables are very influential on the application of soybean plant technology, because the higher levels of education will understand more information or knowledge about the application of soybean plant technology.

Research conducted by Choirutunnisa (2008) shows that the value of the T-test between the level of education and the level of application of integrated rice crop management models is positive and significant. It means that the higher the level of formal education, so the level of application of integrated crop management models will also be higher. By taking education can affect the way of thinking to act and behave towards everything that is faced by both innovation and various forms of existing problems. Haryani (2009) shows that the higher education taken by farmers, the higher their ability to adopt technology and can be able to use input proportionally so that it will improve performance in rice farming. According to Wedy Nasrul (2012), highly educated people are relatively faster in implementing the adoption of innovations, and vice versa those with less education are rather difficult to implement innovation adoption quickly.

Correlation Relationship between Variable Farming Business Experience (X3) with the Application of Soybean Plant Technology (Y)

The analysis shows that farming business experience has a partially significant relationship to the application of soybean technology. The magnitude of the partial relationship of farming business experience with the application of soybean plant technology is 0.331 (Table 3). The length of farming is closely related to the age of farmers, older farmers have more experience than younger farmers. Someone who has been working for a long time is very careful in absorbing new technologies offered from outside, whereas farmers with relatively little experience tend to more easily absorb new technology and more quickly try the new technology in the farming business they manage. Thus, the experience of farming will reflect a person's behavior in his farming business activities.

Research conducted by Choirutunnisa (2008) shows that the correlation between farming business experience and the level of application of integrated rice crop management models is positive and significant. It means that the higher the level of experience, so the level of application of integrated crop management models for wetland soybean will also be higher and more innovation will be used. According to Achmad Faqih (2011), experience is not always through a forml learning process, experience can be increased through a series of events that have been encountered. So, with this experience, we can gain new knowledge that can be used as provisions to apply soybean plant management technology. The experience of farming has a significant effect on the level of adoption of technological innovations in rice cultivation, the more experience the better the rate of adoption of these innovations (Röling and van de Fliert, 1994).

Correlation Relationship between Variable Land Area (X4) with the application of Soybean Plant Technology (Y)

The analysis shows that the land area has a partially significant relationship to the application of soybean plant technology. The magnitude of the partial relationship of land area to the application of soybean plant technology is 0.681 (Table 3). Based on the results of partial correlation test research on land area variables is very influential on the application of soybean plant technology, so the size factor of the land area determines how large the production results of farming. According to Hoffmann, et al (1998), land is as one of the factors of production which is a factory of agricultural products that has a considerable contribution to farming business. Land area has an important role in farming to increase high production yields (Achmad Faqih, 2016).

Research conducted by Choirutunnisa (2008) shows that the T test value between the land area and the level of application of integrated rice crop management models is positive and significant. It shows that the land area use has an affect to the level of application of integrated rice crop management models. So, if farmers whose land use is narrow and farmers who have large land use will have an impact on the level of application of integrated rice crop management models. According to Eaton, et al, (2001), showed that the higher farming business income, the higher the desire of farmers to adopt technology.

CONCLUSION

Based on the results of the analysis and discussion above, it can be concluded that the results of the F test show that the variables of age (X1), education (X2), farming business experience (X3), and land area (X4) are simultaneously related to the application of soybean technology (Y), with the results of the analysis the value of F_{count} 75.981> from F_{table} 2.53 at the value of sig. of 0,000. The variables of age, education, farming business experience, and land area have a correlation value of 0.896, meaning that there is a very strong correlation simultaneously with the application of soybean technology. The test results on the partial relationship obtained results, namely: (a) The age variable has a partial relationship to the application of soybean technology, with the results of the analysis of T_{count}> T_{table}, it is 6.610> 1.681 at sig.t value of 0.000, (b) Educational variables have a partial relationship to the application of soybean technology, with the results of the analysis of T_{count}> T_{table}, It is 4,510> 1,681 at sig.t value of 0,000, (c) Farming business experience variable has a partial relationship to the application of soybean plant technology, with the results of the analysis of T_{count}> T_{table}, It is 2.601> 1.681 at sig.t value of 0,000, and (d) The relationship of land area variable shows that the land area variable has a partial relationship to the application of soybean technology, with the results of the analysis of T_{count}> T_{table} , It is 6.791> 1.681 at sig.t value of 0,000.

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