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Utilization of Sengon Wood Garden as a Farmer Alternative Business

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Abstract: Indonesian people still import soybean at 226% until 2019 [1]. It is necessary to increase production,that is utilize the plantation land. The research was carried out by planting 5 varieties of Indonesian soybeans under the sengon tree. Data analysis used a random subsampling block design with a confidence level of 95% The results of the study showed that there have effect on the use of various types of Indonesian soybean varieties with planting location (Intercropping with sengon wood plant) on production / harvest results. It can be concluded that planting on garden land have effect on the yield of Indonesian soybean. The results of Indonesian soybean production under the sengon tree with an area of 10 meters x 10 meters are as follows: Raja Basa is 2.2 kg, Mutiara1 is 2.3 kg, Dena1 is 2.4 kg, Dega1 is 2 3 kg and Grobogan of 2.5 kg, this is in accordance with the statement of the discoverer that each soybean has a profile of each variety, among others, yields that are different from one another.

Keywords: Soybean Variety, Sengon Wood Garden, Intercropping, Production Result

1. Introduction

On the sidelines of the time of the year often there is still a lot of land that farmers are unemployed because there is no rent / not used, also the land under the garden is empty / overgrown with grass, reeds or other plants that have no value or low value because of less needed , less useful. On the one hand, Indonesian people still import soybean at 226% until 2019 [1].BATAN (National Atomic Energy Agency), assessing imported soybeans other than GMO, the levels are left to waste, may be taken from their home country or because it is too long in the trip [2]. So it is necessary to expand the cultivation of soybean in domestic production, among others by utilizing the land owned by farmers. So far, farmers only know that soybean cultivation can only be done in rice fields. So it is necessary to conduct research and soybean cultivation besides rice fields, among others in gardens under the sengon tree

2. Research Methods

The study was conducted by means of an experiment by applying 5 superior Indonesian soybean seeds planted under the sengon tree. Processing and analyzing data using experimental design. The experimental design used was in accordance with the treatment carried out, namely the block subsampling design with a random model. In Indonesian soybean cultivation, many varieties have been found, so the model used is random, meaning that the conclusion applies to all other domestic soybean production varieties.

3. Results and Discussion

From the results of the experiment, by planting Indonesian soybeans in accordance with the theory and guidelines of the soybean crop research and development unit, the department of agriculture specifically food crops, Jember Regency, East Java Province, Indonesia [16]. Production data from 5 Indonesian Soybean Varieties and Planting Locations are as follows:

Table 1. Production Results of 5 Indonesian Soybean Varieties Under the Sengon Tree
(kg / 10m x 10m)

Block (Planting Location)	Soybean Variety					Amount	Average
	Raja Basa	Mutiara 1	Dena 1	Dega 1	Grobogan		
Under Sengon Tree	2,4 2,2 2,1	2,3 2,5 2,3	2,4 2,5 2,5	2,2 2,3 2,5	2,5 2,5 2,5		
Amount	6,9	7,1	7,3	7,0	7,5	35,8	7,16
Under Sengon Tree	2,1 2,3	2,3 2,4	2,3 2,3	2,2 2,4	2,6 2,9		

	2,2	2,2	2,5	2,2	2,8		
Amount	6,6	6,9	7,1	6,8	8,3	35,7	7,14
Under	2,3	2,4	2,5	2,4	2,3		
Sengon Tree	2,2	2,5	2,5	2,5	2,4		
	2,2	2,4	2,3	2,5	2,4		
Amount	6,7	7,3	7,3	7,4	7,1	34,9	6,98
Grand Total	20,2	21,3	21,7	21,2	22,9	107,3	
Average	2,2	2,3	2,4	2,3	2,5		2,4

Source : Nelly and team 2019

Hypothesis: Variance (σ^2) = 0 = There is no difference in the use of soybean varieties Under Sengon Tree on soybean production yield

Data Processing:

$\sum Y^2 = (2,4)^2 + (2,2)^2 + \ldots + (2,4)^2 + (2,4)^2 = 257,41$

$Ry = (107,3)^2 / 5x3x3 = 255,850$

$Sb = (6,9)^2 + \ldots + (7,1)^2 / 3 - 255,850 = 0,7866$

$Sy = 257,41 - 255,850 - 0,7866 = 0,7734$

$By = (35,8)^2 + (35,7)^2 + (34,9)^2/5x3 - 255,850 = - 4,24$

$Py = (20,2)^2 + (21,3)^2 + (21,7) + (21,2)^2 + (22,9)^2 /3x3 - 255,850 = 0,42$

$Ey = 0,7866 - 0,7734 - 0,42 = - 0,4068$

Data Analysis:

For random models, the calculated F (sample) / treatment value is obtained by the formula:

$F_{0,05}$ (p-1), [(b-1) (p-1)].

Table 2. Analysis of Variance of 5 Types of Indonesian Soybean Seeds Under Sengon Tree

Variation Sources	Degree of Freedom (dk)	Sum of Squares (JK)	Average of Sum of Squares (RJK)	F Count
Average	1	255,850	255,850	
Block (vegetables)	2	4,24	2,12	
Treatment (Indonesian Soybean Variety)	4	0,42	0,105	17,948
	8	0,0468	0,00585	
Error of Experiment	30	0,7734	0,02578	
Error of Sampling				

With the confidence level of 95%, the F value was 0.05 (4.8) = 3.84 → with F Count > F table; the hypothesis was rejected. It mean that there is difference in the production due to the varieties.

The profile of the production of each variety is as follows (Source: UPTD Bangsal Sari Jember and Balitkabi Gadang Malang, East Java Province, Indonesia): (Ton / Ha)

1. Rajabasa : Potential results 3.9, average = 2.05
2. Mutiara : Potential results 4.1, average = 2.4
3. Dega 1 : Potential results 3.82, average = 2.78
4. Dena1 : Potential results 2.9, average = 1.7
5. Grobogan : Potential results 3.4, average = 2.77

4. Conclusion

- There are affect of The use of Indonesian soybean seedlings planted under the sengon tree on the yield obtained.
- Each variety has its own profile
- Plant location is not a decision because in block design theory, blocks are not variable.

- The yield of Indonesian soybeans grown under the sengon tree is an average of 2.4 kg / 10mx 10m.
- Indonesian soybean production yields of Raja Basa varieties planted under sengon trees are on average 2.2 kg / 10mx 10m.
- The yield of Indonesian soybean varieties Mutiara 1 which is planted under the sengon tree is an average of 2.3 kg / 10mx 10m
- The yield of Indonesian soybean varieties Dena1 which is planted under the sengon tree is an average of 2.4 kg / 10mx 10m
- Indonesian soybean production of Dega1 varieties planted under sengon trees is an average of 2.3 kg / 10mx 10m
- The Indonesian soybean production of Grobogan varieties grown under the sengon tree is 2.5 kg / 10mx 10m on average
- The results of this study indicate that Indonesian soybean seedlings can be planted under the sengon tree only for Dena 1 and Raja Basa types that meet the standard limits while for Mutiara1, Dega1 and Grobogan do not meet the profile standards. So it is only 40% percent successful, this is probably due to the root of the sengon tree which affects the roots / growth of soybeans and the lack of light because it is blocked by a much higher sengon tree

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