



ANALYSIS OF VARIETY AND PLANTING TIME OF INDONESIAN SOYBEAN TOWARDS THE PRODUCTION RESULT TO MEET THE DEMAND

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ABSTRACT

To meet the high demand of soybean from domestic soybean production it is necessary to increase the planting time. For years, soybean farmers only plant once in a year that is in June or July. This research was conducted by experiment using 5 superior varieties planted in March, April and May. Data processing and analysis use experimental design of factorial design with random model of 95% confidence level. The results obtained that soybean varieties and planting time does not affect the production results, whether the interaction between soybean varieties and planting time greatly affects the production.

Keywords: Indonesian Soybean Varieties, Planting Time, Interaction, Production Results

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1. INTRODUCTION

Adequate food supply, including soybeans, is the right of every citizen to be fulfilled by the government (Harsono 2008, Agricultural Research and Development Agency 2011). Domestic soybean production should be maximized to meet the needs (Suyono, 2013). Increasing soybean production to self-sufficiency level is not impossible (Supadi, 2008); the shortage of soybean production needs should be solved immediately through efforts to increase non-import production which drains the country's foreign exchange (Harsono, 2008). Superior variety of varieties can be planted throughout the year with intercropping systems tested from Sumatra to Papua (Sinar Tani 2013: Suyono 2013). During this time, domestic

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soybean farmers have been planting only once in a year, namely June or July, or at most twice a year in June and December (Nelly, 2016). One indicator to increase domestic soybean production is growing soybean throughout the year (Nelly, 2017). Therefore a research by planting outside the planting time of farmers needs to be done.

2. THEORITICAL REVIEW

The experiments done with the guidance from soybean experts obtained from the Village Integrated Service Unit (UPTD) Bangsal Sari, Jember Regency, East Java (Djoko, 2015, Imam, 2015). East Java is the largest producer of soybeans compared to other regions throughout Indonesia (Nelly, 2017). The cultivation method chosen by the researchers is the simplest method and easy to apply, considering this research uses farmers who are not soybean growers. Similarly, if the result of this study is significant as stated by researchers in previous studies that planting soybean does not need to pay attention to soil conditions and time, then the results will be applicable as additional information for other researchers and those who need. In that case the purpose to fulfil the demand of soybeans can meet the quality and reasonable price. The data analysis used experimental design theory of 2 factors with random model (Suwanda, 2015). Variety is A factor and Planting time is B factor, as the independent variable. The dependent variable is the result of production or the harvest. The reason of using a random model is because soybean cultivation in domestic production has many varieties, then the conclusion of the research can be applied to all varieties of soybean domestic production includes 5 varieties of soybeans tested. Likewise the planting time is not only for the three months tested only, but can be applied to other months; therefore it will help reducing soybean deficiency.

3. RESEARCH METHODOLOGY

The experiment was conducted with experiment that used five seeds and three planting time. Data processing and analysis used 2-factor experimental design with random model. After doing the cultivation, the next step is soil processing, planting seeds, fertilization, irrigation, harvest maintenance, threshing and cleaning then record the results.

4. RESULTS ANALYSIS

The process of planting domestic soybean is based on the theory and guidance of soybean research and development unit, Ministry of Agriculture especially food crops, Jember regency, East Java province, Indonesia, BBPP 2015 (Agricultural Training Center) Ketindan, Djoko Sumianto, Agribusiness Technical Training Soy.

Also Imam Sutrisno, 2015, Soybean Cultivation Training, Research Institute of Aneka Beans and Tubers, Balit Kabi. The data processing and analysis obtained from the reference of Suwanda, Experimental Design For Scientific Research, ALFABETA, Bandung, 2017.

The results of the experiment are obtained as seen in Table 1.

Table 1 Results of Treatment of 5 Varieties of Indonesian Soybean and 3 Planting Time (Ton/ha)

Planting time (B)	Variety (A)					amount	average
	Raja Basa	Mu tiara 1	Dena 1	Dega 1	Grobogan		
March	2,2	2,7	2,2	3,0	3,2		
	2,9	3,7	2,5	2,9	2,9		
	2,4	3,5	2,4	3,4	2,8		
amount	7,5	9,9	7,1	9,3	8,9	42,7	
Average	2,5	3,3	2,4	3,1	3,0	-	2,9
April	2,4	2,7	2,1	2,8	2,8		
	3,4	2,8	2,5	3,4	3,0		
	3,2	3,5	2,3	3,2	2,9		
amount	9	9	6,9	9,4	8,7	43	
Average	3	3	2,3	3,1	2,9	-	2,9
May	2,1	2,4	2,1	2,9	2,8		
	3,2	2,8	2,2	2,8	3,0		
	2,7	3,2	2,7	2,9	3,0		
Amount	8	8,4	7	8,6	8,8	40,8	-
Average	2,7	2,8	2,3	2,9	2,9	-	2,7
Total amount	24,5	27,3	27,3	27,3	26,4	132,8	
Average	2,6	3,0	3,0	3,0	2,9		2,9

5. HYPOTHESIS

There is no difference in the use of seed type, planting time and interaction of seed type and planting time toward production results.

: Varians: $(\sigma^2 A) = 0$; $(\sigma^2 B) = 0$; $(\sigma^2 AB) = 0$

(There are no different variant for varieties, planting time and interaction A and B to production results)

6. DATA PROCESSING

$$\sum Y^2 = (2,2)^2 + (2,9)^2 + \dots + (3,0)^2 + (3,0)^2$$

$$= 372,15$$

$$R_y = (132,8)^2 / 5 \times 3 \times 3 = 391,9$$

$$A_y = (42,7)^2 + (43)^2 + (40,8)^2 / 3 \times 3 - 391,9$$

$$= 167,8$$

$$B_y = (24,5)^2 + (27,3)^2 + (27,3)^2 + (27,3)^2 + (26,4)^2 / 5 \times 3 - 391,9 = -305,42$$

$$J_{ab} = 1/3 \{ (7,5)^2 + (9,9)^2 + \dots + (8,6)^2 + (8,8)^2 / 3 - 391,9 = -32,21$$

$$A B_y = -32,1 - 167,8 - (-305,42) = 105,52$$

$$E_y = 372,15 - 391,9 - 167,8 - (-305,42) - (105,52) = 12,7$$

7. DATA ANALYSIS

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

$$: A = A/AB ; B = B/AB ; AB = AB/E$$

Table 2 Variance Analysis of 5 Indonesian Soybean Varieties and Planting Time

Variation source	Degree of freedom (dk)	Sum of squares (JK)	Average Sum of squares (RJK)	F calculation
Average of TREATMENT: (Variety)	1	391,9	391,9	
(planting time)	4	167,8	41,95	0,79
Inter-action	2	305,42	-152,7	-2,89
Standar Error	2	105,52	52,76	125,61
	30	12,7	0,42	

With 95% confidence level, it is obtained:

$$F_{0,05} \text{Variety} \quad (4,30) = 2,69$$

$$F_{0,05} \text{Planting time} \quad (2,30) = 3,32$$

$$F_{0,05} \text{Interaction} \quad (2,30) = 2,32$$

F calculation < F table, then the hypothesis is accepted, meaning there is no effect of production result because of the Indonesian soybean varieties, similar to the planting time. For Interaction, F calculation > F table, then the hypothesis is rejected, it means there is influence in production result because of the interaction between soybean varieties of Indonesia and Planting Time.

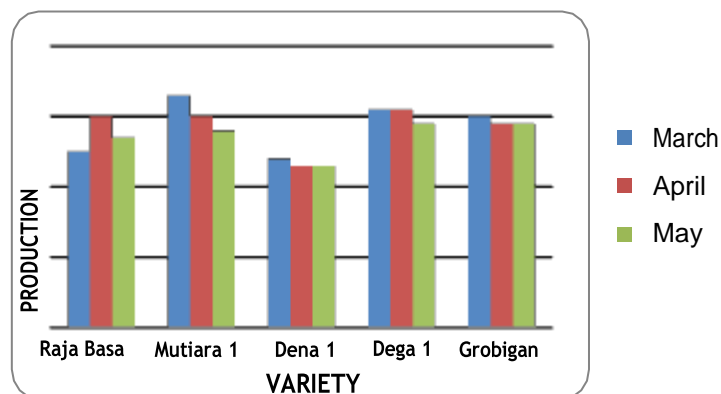


Figure 1 Average production of 3 planting time

From Figure 1 it can be seen that April reach the highest average production of 43 tons/ha, while March and May each produced average production of 42.7 tons/ha and 40.8 tons / ha.

8. DISCUSSION

Table 2 showed that F calculation $<F$ table, therefore the hypothesis is accepted. There is no effect to production result because of variety, same goes to planting location. F calculation $> F$ table, then the hypothesis is rejected, meaning there is influence of production result because of the interaction between variety and plant location. This corresponds to the fact that each type of seed has its own profile which has been discovered by its breeder planted at the breeding site in the usual planting time of soybean farmers. For the interactions, it is proven that there is a difference in the amount of production in each planting time. The results of the research proved that soybeans can grow and can be productive if planted in other locations as well when planted in different month than usual, for instance June or July in Jember and November or December in Banyuwangi (Nelly, 2016), this is being the novelty of the researcher because previous farmers worried about their soybean for not growing or producing.

9. CONCLUSION

1. Indonesian soybean varieties do not affect the results of production obtained.
2. Planting time does not affect the results of production obtained.
3. The interaction between varieties and planting times greatly affects the production results obtained.
4. Planting time in May produced the highest production of 2.7 tons/ha, while March and April each produce 2.5 tons/ha
5. In March, the Mutiaral variety produced the highest average production of 3.3 tons/ha, in April the Dega 1 variety was 3.1 tons / ha and in May the Dega 1 and Grobogan varieties were 2, 9 tons/ha
6. Each variety has its own profile.

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