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FEASIBILITY OF SOYBEAN FARMING BUSINESS FROM YOUTH AND OLD SUBSIDIARIES OF GROBOGAN LOCAL VARIETIES

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ABSTRAK

Permintaan akan kebutuhan kedelai terus meningkat setiap tahunnya, hal ini tidak diimbangi dengan produktivitas. Salah satu peran pemerintah untuk menarik minat petani untuk berusahatani dengan memberikan subsidi. Walaupun belum mencapai target produktivitas ada beberapa petani yang melakukan panen muda. Maka dari itu penelitian ini bertujuan untuk: 1) mengetahui R/C ratio komoditas kedelai polong muda dan polong tua, mengetahui titik impas produktivitas dan harga kedelai polong muda dan polong tua. Pemilihan lokasi dilakukan secara sengaja (*purposive*) dan penentuan responden menggunakan teknik *purposive sampling* dengan jumlah responden sebanyak 39 orang. Sumber data menggunakan data sekunder dan primer. Metode pengumpulan data dilakukan dengan wawancara. Penelitian ini menggunakan analisis R/C ratio, analisis titik impas produktivitas dan harga. Hasil penelitian menunjukkan bahwa R/C ratio komoditas kedelai polong muda >1,23, polong tua = 1. Titik impas produktivitas dan harga kedelai polong muda 523 kg/ha, Rp763 kg dan polong tua 708,21 kg/ha, Rp1.214,93 kg, hal ini melebihi titik impas produktivitas dan harga sehingga menghasilkan keuntungan. Berdasarkan hal tersebut perlu adanya peran pemerintah dalam hal penetapan harga untuk kedelai polong tua untuk menarik minat petani berusahatani kedelai polong tua.
Kata kunci: *kedelai, polong tua, polong muda, R/C ratio, titik impas produksi dan harga*

ABSTRACT

The demand for soybean needs continues to increase every year. This is not matched by productivity. The role of the government is to attract farmers to conduct business by providing subsidies. Even though they haven't reached the productivity target, some farmers conduct the early harvest. Therefore, this study aims to: 1) determine the R/C ratio of young soybean pods and old soybean pods commodity, knowing the breakeven point of productivity and prices of young soybean pods and old pods. The location selection was carried out purposively (purposive) and the determination of respondents using purposive sampling technique with a total of 39 respondents. Data sources used secondary and primary data. The data collection method was conducted by interview. This research used R/C ratio analysis, breakeven analysis of productivity and price. The results showed that the R/C ratio of commodity young soybean pods> 1.23, old pods = 1. The breakeven point of productivity and price of young pods was 523 kg/ha, IDR 763 kg and old pods 708.21 kg/ha, IDR 1,214, 93 kg, this exceeds the breakeven point of productivity and price and thus results in a profit. Therefore, there is a need for the government to play a role in setting prices for old soybean pods to attract farmers to cultivate old soybean pods.
Keyword: *soybean, young pods, old pods, R/C ratio, break-even point production and price*

INTRODUCTION

The government patents soybeans under the name of local variety Grobogan Non-GMO (Geneticaly Modified Organisms) as superior seeds (Prasetya & Yuliawati, 2020). Grobogan soybean varieties are very influential in soybean production. Grobagan soybean variety is one of the main contributors to national soybean production. Grobagan soybean variety has been widely cultivated in Central Java because it is topographically following soil characteristics so that it can thrive. It is technically more disease resistant, harvest time is fast, and the quality of the seeds produced is very good so that it is profitable when cultivated. Grobagan soybean varieties are developed by the government in collaboration with the private sector and involving farmers. Increasing the quantity and quality of the use of superior seeds of the Grobogan variety for farmers is provided with subsidies in the form of indirect subsidies (price subsidies) and direct subsidies. Direct seed subsidies are implemented in the form of Superior Seed Direct Assistance (BLBU) and the National Seed Reserve (CBN).).

Constraints faced in the development of soybean commodities including limited planting area. This is caused by agricultural land that has changed its function to non-farm or farmers switch to planting other more profitable commodities. Thus, soybean production becomes low as Rahmawati *et al.*, (2018), Sofhan *et al.*, (2019), dan Aldillah, (2015) revealed that land area is very influential on agricultural production. This greatly affects the productivity of soybeans. The government program through the Ministry of Agriculture targeted national soybean self-sufficiency in the 2015-2019 strategic plan. Efforts made in food self-sufficiency were by expanding the planting area (extensification) and increasing land productivity (intensification). Bancak Subdistrict is one of the locations in Semarang Regency which is currently used for the cultivation and development of soybean plants in the hope of being able to meet soybean needs and increase productivity figures that have been set by the Government. Soybean productivity in Bancak District is 1.39 tons/ha. This figure is still below the national standard for soybean production. Not to mention that the soybean production system in Bancak District is divided into two systems, namely the production of young pods and old pods. Thus, the productivity that the government wants to achieve has not yet reached the target.

Based on this case, as the government, the development of soybeans in Bancak District is directed at increasing the planting area. It can be achieved through optimizing the use of existing land from rice fields and dry fields or in young plantation areas and Perhutani as intercrops, rotation, and intercropping to increase the index. cropping through cropping pattern settings (Prasetyo & Suriadikarta, 2006). The thing to pay attention to is the potential of agricultural land. Hence, it becomes a top priority for meeting needs by considering economic, social, and ecological aspects so that farming activities are sustainable (Keratorop *et al*., 2016). This is carried out to increase the production of soybean farming. There are various obstacles in soybean development, including in economic terms, namely: (1) farmers haven't interested yet in growing soybeans because the level of financial incentives is not attractive; (2) the industrial seed system for soybeans has not yet been developed; (3) it is difficult for farmers to obtain cheap fertilizers and pesticides, even though soybean is a plant that is susceptible to plant pests; (4) the partnership pattern has not developed, because the private sector is not yet interested in soybean agribusiness; (5) lack of partisanship of government policies (Zakaria, 2010). In this case, the government's role in providing subsidies in the form of seeds is wrong. Opportunities in providing seeds are one way to increase soybean productivity. It can be conducted by planting high-yielding varieties according to site conditions. The Grobogan variety is superior because it has

the characteristics of large seeds of 18 g/100 seeds, as well as early maturity, 76 days of ripening age, and according to land conditions in Bancak District (Nuswantara *et al*., 2018).

The use of superior varieties of seeds is expected to increase productivity so that farmers' income can also increase. Several studies related to soybean farming provide quite diverse information which in research by (Berliana, 2018), the soybean variety used in North Lampung District is the Anjasmoro variety. In addition, research conducted by (Laksono & Bidang, 2011) applied the PTT cropping pattern in Nimbrokrang, Jayapura Regency with soybean varieties of Ijen increased soybean productivity. Based on these expectations, one of the government's expectations is to increase soybean productivity by providing convenience and subsidies for seeds of the Grobagan variety in soybean farming in Bancak District, Semarang Regency. However, in Bancak District, for soybean farming, the Grobagan variety is known for 2 harvesting systems; young pods and old pods. This fact is what makes the income of each respondent farmer different which results in the selling price of young and old soybean pods being different. Based on the existing problems, this research would see how much the costs, income, profits, and feasibility of farming young and old soybean pods using subsidized Grobagan variety seeds are. The objectives of this study were: 1) to determine the R/C ratio of young and old soybeans 2) to determine the break-even point of productivity and prices of young and old soybeans.

RESEARCH METHOD

Soybean farming in Bancak District was divided into two parts where there are inputs (land, seeds, fertilizers, pesticides, equipment, labor) and produce outputs (outputs). In producing soybeans in Bancak District, it was divided into 2 parts, namely young and old pods. This affected farmers' acceptance where the price of young and old soybean pods is different. This affected the income so that the results received for each farmer are different. After the income was obtained, it was reduced by the use of inputs used by farmers, income results were obtained. it was determined that young and old soybean pod farming is profitable or not by looking at the feasibility of farming in Bancak District so that financial feasibility was carried out to prevent and at the same time evaluate the development of soybean farming by looking at R/C Ratio and the break-even point of productivity of young and old soybean pods in Bancak District, Semarang Regency.

The research was conducted in Bancak District, Semarang Regency from December 2018 – March 2019. The location selection was purposive with the consideration that Bancak District was one of 6 sub-districts in Semarang Regency which produced the largest soybean production of 1 086.00 tons in Semarang Regency. The population that grew soybeans in Bancak District was 162 people. The sampling of 28 people consisted of Mboto, Bantal, and Plumutan villages. Sampling using a purposive sampling technique. according to Sugiyono, (2010), it is with certain considerations based on the characteristics that consider the characteristics of the population of farmers who grow soybeans that are able to input and output so that they understand the price of farming, the cropping patterns carried out by respondent farmers are almost the same or uniform, the land used is narrow and planted on rainfed rice fields. The data collected in the research consisted of primary and secondary data. Secondary data was obtained from the relevant agencies or agencies regarding regional conditions, social and economic potential. Related institutions were BPS, Agriculture Service, and Bancak District Office. Primary data were obtained from farmers by interviewing using a questionnaire guide.

The data analysis technique is by calculating the feasibility analysis of farming calculated using the R/C ratio.

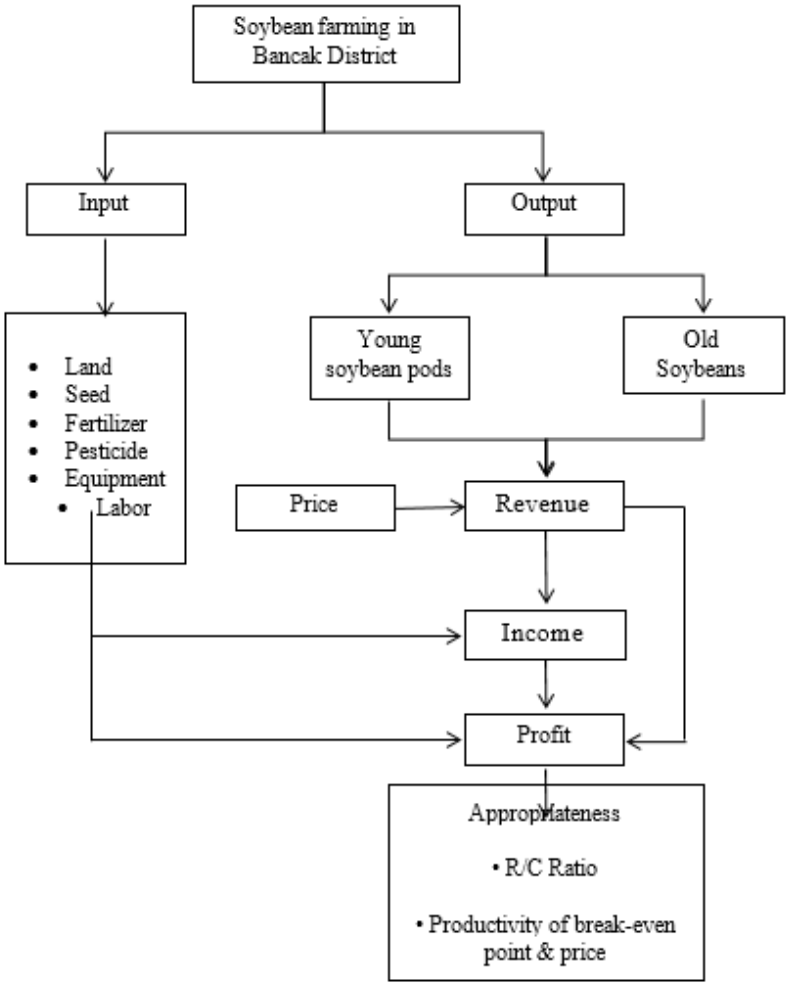

Figure 1. Research Framework

The R/C ratio is the ratio between the receipts received and the costs incurred, and is calculated by the following formula (Rahim & Hastuti, 2007):

$$R/C = \frac{TR}{TC}$$

information:
TR = Total Revenue
TC = Total Cost

Test Criteria:
R/C *ratio* < 1, farming is considered to be unfeasible. R/C ratio > 1, farming is said to be feasible. R/C ratio = 1, the farm does not experience profit or loss. To find out the break-even point production and prices are calculated using the following formula:

Productivity Break-even Point (TIP) Y = $\frac{BT}{H}$

Productivity Break-even Point (TIP) H = $\frac{BT}{Y}$

information:
BT = Total cost (Rp/ha)
Y = productivity (kg/ha)
H = commodity Proce(Rp/kg)

RESULT AND DISCUSSION

Characteristics of Research Respondents

The sample farmers in Bancak Sub-district were 49 years old on average. This age was classified as productive because farmers could adopt new technology to do in their farming. Meanwhile, the education of the sample farmers was still relatively low, namely elementary school. This was very

influential on the management of decision-making on the use of agricultural inputs that could result in greater farm expenses. The farming experience of soybean farmers was an average of 4 years. This was still relatively new because farmers were reluctant to plant soybeans due to low soybean prices. It is in line with the research of (Indratanaya *et al.*, 2019) in Lungatad Sub-Division, Denpasar City for age, the level of education is the same only in the experience carried out in Lungatad Sub-Section, including farmers who take part in training to improve farmers' knowledge and skills in the application of technology. The average total family member was 4 people. This was an advantage for farmers in terms of energy because it could minimize the cost of labor that was quite large. Furthermore, the average arable area of soybean farming was 0.5 ha, with the highest arable area of 2 ha and the smallest being 0.25. It depends on the ability of farmers to manage their land.

Table 1. Characteristics of Soybean Farmer Respondents in Bancak District, Semarang Regency

Information	Mean	Maximum
Age (year)	49	66
Education	SD	-
The duration of farming business	4	7
Family member	4	6
Land area	0,5	2

Source: primary data (processed 2019)

Grobogan Soybean Varieties

The Grobagan soybean variety is a superior variety introduced by the Ministry of Food in 2008 to support demand and increase soybean productivity. The advantage of the Grobogan soybean variety is that it is ripe (76 days). This is similar to what was stated by(Sumadi et al., 2017), the average harvest age of soybeans grown in Cikarang and Jatinangor for the Grobagan varieties was ±76 days, Anjasari of 98-100 days, Argomulyo of 80-82 days, Anjasmoro of 82.5-92.5 days. Large seed size (about 18g/100 seeds) as in research by (Warbaal *et a*l., 2019), the Grobogan variety when compared with other varieties such as Anjasmoro, Burangrang, Rajabasa, and Detam 2 produced a greater seed weight of 26.26 grams/100 seeds when compared to other varieties with seed weights per 100 grams ranging from 15.09 to 19.6 grams. This proves that the Grobogan variety has a relatively large seed size, the higher the seed weight. This soybean is suitable in rainfed rice fields or areas with limited rainfall because it can utilize water. The average yield of Grobogan soybean is ±2.77 tons/ha with a potential yield of 3.40 tons/ha, protein content 43.9%, fat content 18.4%, other characteristics of pods are not easily broken and at harvest 95%-100% fallen leaves. Based on the Balitkabi study (2015), the Grobogan variety has a yield at the farmer level of 1,775, giving an additional yield of 1,167 for the local variety, where the Grobogan variety provides the third highest economic contribution under the economic contribution of the Anjasmoro and Mahameru varieties.

The Use of Soybean Production Input

The use of inputs for old and young pods soybean in Bancak District, Semarang Regency varies, depending on the area of land and the ability of farmers to manage it. The following inputs are used by farmers:

The seeds used by farmers in Bancak District, Semarang Regency are the Grobogan variety. A seed was the means of production in determining soybean production. The average total seed use per hectare was only 21.63 kg. It was still below the standards of the Agricultural Research and Development Agency (2010) that requires 40 kg of seed per hectare. This was affected by the use of a very narrow land area for young soybean pod farming, the land area used was 4,976 ha and young pods 4,611 ha. Seeds were provided free of charge by the government, with the help of seeds from the government helping farmers in Bancak District in soybean farming so that the costs for spending on

purchasing inputs are reduced as in research (Farikin et al, 2016) that seed costs greatly affect soybean farming.

The use of fertilizers used by respondent farmers in Bancak District was manure (organic) and urea, Phonska, TSP 36 (an organic) on young and old soybean pod plants in Bancak District presented in the figure below.

Based on Figure 2, the use of organic and non-organic fertilizers in soybean farming in Bacak District was mostly used in old-pod soybean farming. This was affected by the land area used for old-pod soybean farming of 4,976.19ha compared to 4,611,11 young pods. The price of each fertilizer consisted of IDR 1,800/kg for urea, IDR 2,300/kg for Ponska, and IDR 2,300/kg for TSP. This price was included in the subsidy price provided by the government to farmers while the price for manure was IDR 800/kg.

Pesticides used in soybean farming were needed considering the vulnerability of soybean plants to attack by plant pest organisms (OPT) such as armyworms, leaf caterpillars, stem flies, pod caterpillars, planthoppers. The use of pesticides was based on pests that attack soybean plants. The use of pesticide brands in Bancak District used by soybean farmers was: matador, dencis, dursban, starban, roundap, noxson, polaris, Kayabas and Rumpas.

Labor in soybean farming is very important for soil processing, planting, weeding, fertilizing, controlling pests and diseases, harvesting to post-harvest. The workforce used is classified based on labor within the family and outside the family which is divided into male and female workers. The wages given to workers were IDR 60,000/day. Young soybean pod farm laborers were more efficient because they did not require costs for work harvesting until post-harvest, and also for threshing costs. The use of production inputted from seeds, fertilizers, pesticides, labor carried out in Bancak District was similar to the research by (Deswika *et al.*, 2017) regarding the income analysis of old soybean pods and young pods in Jatiwaras District, Tasikmalaya Regency, West Java, there was only a difference in the use of production inputs in Bancak District only on old pod farming.

R/C *Ratio*

Soybean farming income in Bancak District for young and old pods is profitable. This is affected by the income received by farmers that were higher than the total expenditure for soybean farming.

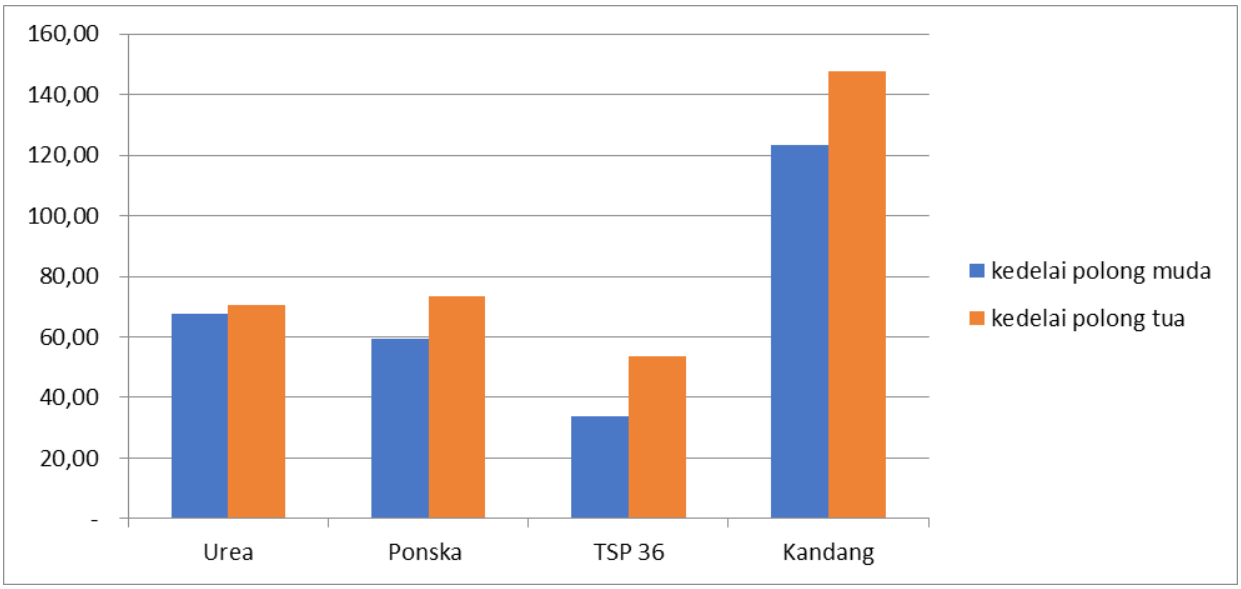

Figure 2. The Use of Organic and Inorganic Fertilizers

However, the revenue for old pod soybean farming is greater than that of young pods. This is affected by the selling price of old soybean pods being greater than the young pods. The price difference between young pods and old pods was Rp. 2,000 and also the production rate of old pods was higher than young pods.

The analysis of the R/C ratio was the result of a comparison between farm revenues and farm expenditures. This analysis was used to determine the feasibility of the farming run. These results showed how efficient the farming of young and old soybean pods is in Bancak District, Semarang Regency. The results of the analysis of the R/C ratio of young soybean pods and old pods can be seen in Table 2.

The results of the R/C ratio analysis based on the table that between young soybean pods and old pods are feasible to cultivate where the R/C ratio ≥1. It means that soybean farming is still feasible to cultivate. The highest R/C ratio in young soybean pod farming was 1.23. It means that for every additional unit cost of IDR. 1,000, the revenue was IDR. 1,230 with the assumption that production and prices are fixed. The lowest R/C ratio in old pod soybean farming = 1.00 means that old soybean pod farming does not experience profits and losses where the expenditure costs are almost the same as the revenue costs. Similar to research by(Anwar *et al.*, 2019) in Ciamis Regency that the R/C ratio of young pods is higher than that of old pods due to the higher revenue price and lower cost.

Table 2. Feasibility of Farming Young and Old Soybeans Pods in Bancak District, Semarang Regency

Type of activity	Young pods (Rp/ha)	Percentage (%)	Old pods (Rp/ha)	Percentage (%)
Total Soybean Production (kg)	1.166,67		1.419,83	
Soybean selling price	4.000,00		6.000,00	
Total revenue (TR)	4.666.666,67		8.518.979,59	
Production cost:				
Variable Cost:				
1. Manure	98.666,67	4,71	118.131,52	2,78
2. Urea fertilizer	122.000,00	5,82	126.808,16	2,98
3. Phonska Fertilizer	130.370,37	6,22	161.483,14	3,80
4. TSP 36 Fertilizer	77.944,44	3,72	123.042,33	2,90
5. Pesticide	105.444,44	5,03	84.634,35	1,99
6. Labor	1.415.111,11	67,52	3.008.489,80	70,80
Total Variable Cost	1.949.537,04		3.622.589,31	
Fixed Cost:				
1. Tractor	54.488,89	2,60	152.038,10	3,58
2. *Rontok*	-	-	268.240,36	6,31
3. Taxes and Land Rent	91.693,90	4,38	206.416,66	4,86
Total Fixed Cost	146.182,79		626.695,12	
Total production cost (TC)	2.095.719,83	100,00	4.249.284,43	100,00
Soybean Farming Income	2.570.946,84		4.269.695,16	
R/C Ratio	1,23		1	

Source: primary data (processed 2020)

The problem is that old pod soybean farming in Bancak District has a lower R/C ratio than young pods because old pods have a longer harvesting age (production) and there is the additional use of costs such as labor for harvesting and also the use of fall machines. at harvest. Research conducted by (Nuswantara *et al.,* 2016) related to soybean farming, Kebonagung Village, Grobogan Regency is feasible, but in the development of production cost factors and selling prices continue to change and tend to switch to other profitable commodities so that soybean farmers will switch to other more profitable commodities. In Bancak sub-district, some farmers choose to harvest young soybean pods with the consideration that the harvest time is relatively fast (45 days) and there is no need to pay labor costs at harvest because the buyers will do the harvesting themselves.

The difference in soybean production in Bancak District, Semarang Regency was influenced by several factors; first, for young soybean pods, the production period was short. The need for fast funds was affected by the needs of farmers, and the costs incurred by farmers were smaller in soybean farming. The selection of young pod soybean farming was affected by the expenditure for young soybean pod farming smaller than that of old pod soybean farming. The existence of this young pod production system greatly affected the national soybean production announced by the government to be self-sufficient in soybeans.

Break-even of Productivity and Price Analysis

The break-even point shows the point where the expenses incurred are balanced with the income received. Thus, there is no loss or profit. Knowing the productivity and minimum price charged to soybean farming, farmers need to know the break-even point of productivity and the price obtained at harvest can be seen in Table 3.

Table 3 shows the highest productivity of break-even point for old soybeans at 708.21 compared to young soybeans at 523.93. This was influenced by the productivity of young soybean pods which were smaller than old soybeans. This was because the yield of young soybean pods harvested and sold was still wet and the pods were not filled. Thus, the selling price obtained from selling young pods is also lower than the old pods. The results showed that young and old soybean pods were above the minimum productivity, which meant that soybeans were still profitable for farmers in Bancak District. Although the results were favorable, the productivity target set by the Ministry of Agriculture should be 3.4 tons/ha, but in Bancak sub-district, it was not sufficient because the average national soybean productivity while the average productivity in Bancak sub-district itself was low at 1.3 tons. It was below the productivity standards set by the government. Increased productivity can be conducted by increasing the area of arable land such as research by (Wadu *et al.*, 2019) revealing that increasing land area can increase productivity.

Table 3. Analysis of the Break-even Point of Productivity and Prices of Young and Old Soybean Pods in Bancak District, Semarang Regency

Commodity	Cost (IDR/ha)	Productivity (Kg/ha)	Market Price (IDR/kg)	TIP (Kg/ha)	TIH (IDR/kg)
Young soybean pods	2.095.719,83	2.745,37	4.000	523,93	763,37
Old soybean pods	4.249.284,43	3.497,55	6.000	708,21	1.214,93

Source: Primary Data (processed 2020)

Table 3 also shows that the break-even point for old soybean pods was higher at IDR. 1,214.93/kg, while young pods were lower at Rp. 763.37/kg. This is beneficial at the farmer level because the actual price (market price) received by farmers for selling young and old pods is higher than the break-even point. If the change in the price of young soybeans decreased to 19.08%, and old soybeans were 20.25%.

It was very influential where soybean farming is not profitable. Thus, in terms of production and selling prices, farmers must pay attention to the farming they run to provide benefits. The higher the selling price and production, the higher the farmer's income (Lumintang, 2013). The sale of the results of each farmer's commodity must be sold when the price is high in order to obtain a high profit because the price is not only determined by the production obtained but based on the market price as in the study of (Tamalonghe *et al.*, 2015), with large land area and high production prices will lead to increased production and income. The determination of the purchase reference price that only considers farm costs for the production of young soybean pods and old pods has not provided optimal support for increasing soybean farming income. Hence, it is necessary to consider all cost components as well as government intervention to help strengthen the bargaining position of farmers in the soybean commodity trading system in Indonesia so that the supply chain from farmers to final consumers can be cut so that it can have a direct impact on increasing farm income (Aldillah, 2018).

CONCLUSION AND SUGGESTION

Conclusion

Based on the results of data analysis and discussion, it can be concluded from the research that the R/C ratio of young soybeans >1 while the R/C ratio of old soybeans =1, the factors that become obstacles in soybean farming are where the production factors and prices are different. The break-even point of young soybean pods is 523.93 kg/ha and old pods are 708.21 kg/ha. The break-even point of young soybean pods is IDR. 763.37/kg and old pods are IDR.1.214.93/kg. It can be concluded that the farming of young and old soybean pods in Bancak District is feasible.

Suggestion

Based on the conclusion above, it is recommended for farmers to continue to cultivate old soybean pods to achieve the national productivity target and the selling price offered to farmers for old pods is higher than young pods. The role of the government must also determine the appropriate price of soybeans to attract the interest of farmers to keep growing old soybeans.

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