Farming Analysis of Red Potato with Various Dose of Fertilizer in Highland

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ABSTRACT

This research was aimed to: 1) determine potential productivity of red potato farming in highland with various doses of fertilizers, 2) know of income and farming earned financially from each dose of fertilizer. The research was conducted in about rainy season for four months in Rejang Lebong regency. The doses of fertilizer used as much as 3 doses, namely: 1,000 kg NPK Phonska + 400 kg SP 36 / hectare (dose I), 1.400 kg NPK Phonska + 400 kg SP 36 / hectare (dose II) and 1,500 kg NPK Phonska / hectare (dose III). Data obtained on the quantitative descriptive analisys to calculate the production of potato farming and analysis (R/C) ratio to determine the level of income obtained by farmers financially. Results of the study were: 1) the potential productions resulting from each dose of fertilizer respectively were 19.30 ton/ha, 19.25 ton/ha and 19.05 ton/ha, 2) Farming income from each fertilizer dose were Rp 29,506,000,-; Rp 28,281,000,-; Rp 28,011,000,- and (R/C) ratio of each of fertilizers dose is 1.514; 1.484 and 1.485.

Key words: farming, fertilizers, highland, red potatoes.

INTRODUCTION

Potato (*Solanum tuberosum*) is a plant of Solanaceae family shaped shrubs or herbs and has a stem tuber eatable. Except carbohydrates and protein, this vegetables are rich vitamin C and potassium. This causes the potatoes become a vegetable with a dual function ,as a vegetables and carbohydrates substitute (Langoy, 2013). High Economic value make potato as one of excellent commodities grown in the highlands.

Potato can growth well in altitude more than 1000 m above sea level. In highland, potato get cold night temperature to form the tuber (Damiri dan Sugandi, 2013). But, if plants vegetables in higland also have some troubles. Except washing of NO_3, vegetables farming also affected by erosion rates , the availability of organic material, and the participation of farmers in extension (Widiriani *et al*., 2009). The use of fertilizers is determined by the balance of nutrients to be more efficient and can increase highland vegetables farmers' income (Kasno *et al*., 2009).

Fertilization is the provision of materials to the soil to improve and enrich the soil in the form of macro and micro elements (Notohadiprawiro *et al*., 2006). According to Setyorini *et al*., (2004) plant needs 16 essensial element for growing. The C, H and O element they get from air (CO_2) and water (H_2O), while of 13 element either divided into two parts, namely six macro nutrients and seven micro-nutrients. Macro nutrients is nutrients required by plants in large numbers, while micro-nutrients are elements needed by plants in small amounts. Elements belonging to macro nutrients are nitrogen (N), phosphorus (P), kalium (K), calcium (Ca), magnesium (Mg), sulfur (S), while the micro-nutrients are boron (B), manganese (Mn), copper (Cu), zinc (Zn), iron (Fe), molybdenum (Mo) and chlorine (Cl).

Rejang Lebong has regional characteristics and agro-ecosystems that are suitable for the development of potato. But for the development, production technology still has limitations. The level of potatoes productivity is 13.65 tonnes/hectare is still far below the national productivity (16.09 tonnes/hectare). Therefore, even though the application of cultivation in this area is still not so good, but the potential development production through area expansion and increase of productivity is still very possible.

Currently, potato farmers in Rejang Lebong planted many red potatoes than granola. Selling price of red potatoes is higher than price of ordinary potatoes become one of the attractions for farmers to cultivate red potatoes. However, research to determine the potential of farm production of red potatoes with various doses of fertilizer has not been done. So, we can get recommendations appropriate fertilization profitable for farmers and red potatoes . This research aimed to: 1) determine

potential productivity of red potato farming in highland with various doses of fertilizers, 2) know of income and farming earned financially from each dose of fertilizer.

.MATERIALS AND METHODE

The research was conducted in Talang Lahat Village Sindang Kelingi Sub District Rejang Lebong regency. Research location include of highland with height more than 1.000 m from above of the sea and andosol type of soil. The experimental was randomized block design with three treatments and four replicationsusing farmers' land and involving farmer participatory manner, so that is made farmers known clearly about implementing activities.

The provision of fertilizer used as much as 3 doses, namely: 1,000 kg NPK Phonska + 400 kg SP 36 / hectare (dose I), 1.400 kg NPK Phonska + 400 kg SP 36 / hectare (dose II) and 1,500 kg NPK Phonska / hectare (dose III). NPK use is NPK by content 15-15-15. Data obtained on the quantitative descriptive analisys to calculate the production of potato farming and analysis (R / C) ratio to determine the level of income obtained by farmers financially

RESULT AND DISCUSSION

General Condition of Region

Talang Lahat village is located approximately 3 km from the capital of the Sindang Kelingi District and approximately 25 km from the capital of Rejang Lebong . Total area of the village of about 340 ha, divided into dry land area of 285 ha (83.82%), plantation of 30 ha (8.82%), and housing, yard, and other grounds 25 ha (7.36%). Most of the population livelihood as farmers with cultivated commodities include: chili, cabbage, collards, cauliflower, tomatoes, leeks, carrots, potatoes, eggplant, and beans.

Talang Lahat topography consists of a flat topography, wavy, until hilly with slopes up between 8-60 %. Soil acidity levels between 5.5 to 6.5 with a height of between 750 to more than 1,000 m above sea level. Andosol soil types dominate the soil with good drainage and topsoilas thick as 42 cm. Rainfall average of 2,850 mm per year with the spread almost evenly throughout the year consisting of 9 months and 3 months of dry wet (Rohadin, 2011).

Potential Production and Revenue Financial Red Potato Farming

Red potato production obtained from each dose is 19,300 kg/ha; 19,250 kg/ha and 19,050 kg/ha. The highest production was obtained from the aplication of dose I (Table 1).

In general, the amount of potato production resulting from the package of fertilizers dose used is not much different. Its mean that is the use of fertilizers for each dose is quite in accordance with the conditions of the study sites. Differentiates from each dose is the content of the element nitrogen (N) and phosphorus (P) of each package.

Nitrogen element is playing an active role in the vegetative growth period. Symptoms of N deficiency plants look in stunted, leafs yellow and fall. According to Hakim *et al*. (1986), Phosphorus plays an active role in transferring energy within the cell and also plays a role in root development. It serves to support plant roots firmly and serves the plant with water uptake and nutrient (Fisher dan Dunham, 1992). A common symptom when a phosphorus deficiency is impaired growth, stunted plants and poor rooting and declined production.

All packages of dose fertilizers are also feasible to apply because they have a value of R/C> 1. Calculation of R/C is performed to determine the magnitude of the relative advantages of farming is done in one growing season. The research result is in line with several previous studies include research Djufri *et al*. (2014) concerning the application of various doses of NPK Super and the percentage of humat acid (HA) to potato crops on andosol land in the village of Pattapang, District Tinggi Moncong, Gowa, South Sulawesi.

The highest potato production obtained in NPK fertilizer treatment Super 300 kg / ha + 1.5% AH. The addition of AH on potato can save the use of NPK fertilizer as big as 50%. Potato farming with fertilizer NPK Super 300 kg/ha + 1.5% AH can provide benefits Rp73.481.339/ha with RC ratio of 2.75. Sutrisna study (2003) on the Alamendah Village, Rancabali subdistrict, Bandung district in summer 2001 showed the results of the use of NPK 20-9-9 fertilizer on potato plants most profitable

compared to other treatments and deserves to be recommended. Because it provides the highest marginal rate of return, 1.74 (174%).

Table 1. Potential Productionand Revenue Financial Red Potato Farming in Talang Lahat District of Sindang Kelingi Rejang Lebong

No	Description	Dose I		Dose II		Dose III	
		Volume	Value (Rp.000)	Volume	Value (Rp.000)	Volume	Value (Rp .000)
1.	Cost (hektar)						
	Seeds	1.500	18.000	1.500	18.000	1.500	18.000
	Fertilizers (kg)						
	a. NPK	1.000	2.500	1.400	3.500	1.500	3.750
	b. SP 36	400	880	400	880	0	0
	c. Organik	10.000	5.000	10.000	5.000	10.000	5.000
	d. Mikro	25	875	25	875	25	875
	Fungisida		7.500		7.500		7.500
	Insektisida		5.625		5.625		5.625
	Labours (HOK)						
	a. Land management	69,00	4.140	69,00	4.140	69,00	4.140
	b. Plant	24,15	1.449	24,15	1.449	24,15	1.449
	c. Maintenance	78,30	4.968	78,30	4.968	78,30	4.968
	d. Harvest	106,77	6.406	106,77	6.406	106,77	6.406
	Total Cost		57.343		58.343		57.713
2.	Production (kg/ha)	19.300		19.250		19.050	
3.	Selling price (Rp/kg)		4,5		4,5		4,5
4.	Revenue (Rp)		86.850		86.625		85.725
5.	Income (Rp)		29.506		28.281		28.011
6.	R/C	1,514		1,484		1,485	

Source: Primary data 2012 processed

CONCLUSION

1) Potential production from each dose of fertilizer respectively was 19.30 ton / ha, 19.25 ton/ha and 19.05 ton/ha.
2) (R/C) ratio of each of fertilizers dose is 1.514; 1.484 and 1.485.

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