Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

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ABSTRACT

The purpose of this study include: (1) Discover the difference in growth of seedlings of sugarcane in dry land with the use of inorganic fertilizer and the addition of sugar factory waste. (2) Know the difference analysis of farming and productivity of seeds cane on dry land with the use of inorganic fertilizer and the addition of sugar factory waste. (3) Determine the cost efficiency effort seeds cane on dry land by using inorganic fertilizer and the addition of sugar factory waste. (4) Determine the feasibility of sugarcane seeds business in dry land by using inorganic fertilizers and adding sugar factory waste.The analysis used in this study were: (1) Analysis Comparison of Growth using tabulation the data. The results showed differences in the results of production between three treatments, namely : Treatment of first use of NPK fertilizer 600 kg/ha and ZA 400 kg/ha showed yields 62 tons/ha while both use treatment NPK 600 kg/ha and ZA 400 kg/ha plus 2.5 tons/ha cut shows 63.6 tons/ha yield and the third treatment with NPK fertilizer dosage 300 kg/ha and ZA 200 kg/ha plus 2.5 tons/ha cut show 60.2 tons/ha yield. (2) Cost Analysis of farming and productivity by calculating the results of crop production using a system of tile on the treatment Into two with total cost of Rp. 3,842,353 and get the production of sugarcane seedlings of 63.6 tons/ha with an income of Rp. 610,114 (3) Analysis of the efficiency of businesses using the calculation of Revenue and Cost Ratio, the results obtained that treatment of three doses of NPK fertilizer 300 kg/ha and ZA 200 kg/ha with added 2.5 tonnes of sugar factory waste/hectare produce efficiency better business value The highest R/C ratio is 1.19. (4) Analysis of feasibility level of the business efficiency by calculating Benefit and Cost Ratio, results were obtained that the dosage of NPK fertilizer 300 kg/ha and ZA 200 kg/ha with added 2.5 tonnes of sugar factory waste/hectare produced level of feasibility of the highest value of B/C Ratio of 1.18.

Keywords : Grade, productivity products, sugarcane seedlings, farming, R/C Ratio and B/C Ratio

1. INTRODUCTION

The decline in national sugar production based on sugarcane is getting further and further away from the target desired by the government. Domestic sugar demand in 2016 is 5.7 million tons in the form of 3.2 million tons of refined crystal sugar (GKR) for industry and 2.5 million tons of white crystal sugar for consumption while the national sugar production is 2.2 million tons per year. (Ditjenbun, 2016).

It is caused by a factor of sugarcane land availability that has been narrowed and shifted from watery paddy fields and lush, switch to the dry fields that tend to be dry and not watery, by relying on irrigation rainfed (Balitbangpertan, 2012).

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 113

Other factors are the decline in the productivity of sugarcane fields, one of which is influenced by the availability of seed and fertilizer treatment to the cane crop due to lack of the element of organic in the land (Purnomo *et al.*, 2011). Organic materials have several advantages namely easily available materials, low cost, but availability is constantly changing and must be given manytimes in large numbers (Edi Tando, 2017).

Factor cultivation and crop cost production is higher, the availability of fertilizers to farmers less than the maximum, while farmer demanded still exist and can get a good cane production (Mahrus, Bambang Wicaksono, Nurlina, Cholil, & Sri Wiwoho, 2017). One of them is by using fertilizer from organic materials to increase sugarcane production at a lower cost to improve productivity raw materials by using good sugarcane seeds.

Research purposes

The researchers' goal early this is :

1. Knowing the differences in the growth of sugarcane seeds in dry land by using inorganic fertilizers and the addition of sugar factory waste.
2. Knowing the difference analysis of farming and productivity of sugarcane seeds on dry land with the use of inorganic fertilizer and the addition of sugar factory waste.
3. Knowing the cost efficiency effort sugarcane seeds on dry land using inorganic fertilizers and the addition of sugar factory waste.
4. Knowing the feasibility of sugarcane seeds business on dry land using inorganic fertilizers and the addition of sugar factory waste.

2. RESEARCH METHODOLOGY

Research location and time.

The location study was conducted at the Experimental Station owned one part of sugar factory in Lamongan is in the hamlet Kedungbunder, Kedungsoko village, subdistrict Mantup, Lamongan. The research activities starting from the preparation of tillage in the month October 2018 s.d retrieval and processing of data and preparing reports research on the moon in July 2019, while retrieval of data (observations) conducted on estimates of sugarcane seeds up to the age of 6 months, in order to speed up the process of data collection, then the tile sampling method is used (Purwono, 2015). The soil type in the location of research is in the form of clay, air clay which is colored black (grumosol).

Plant Treatment

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 114

a. Experimental plots were made in 3 plots with a size of 0.01 Ha per plot. among the plots is limited by 1 irrigation channel. while the total area of the experimental plot is 0.03 Ha

b. The planting material used is a seed Budchip eye grows with distance PKP 1.10 cm and the distance between the seedlings 40cm. Before planting, seeds are selected and sorted to ensure the seedlings free of varieties mix and clean of pests and systemic disease.

c. Sugar factory waste compost is given to the irrigation channel when the irrigation channel is finished and is given 1 week before planting according to the treatment dose by sowing evenly on the basis of the juringan. Treatment compost given before planting will react with the soil, so the soil chemical and physical processes had occurred before planting sugarcane.

Tucker type

1) Fertilizer ZA containing 21% N

2) Fertilizer Phonska (15-15-15)

3) Sugar factory waste of Sugar factory, *the results of the sugar factory waste are presented as follows:*

Table 1. Analysis of Sugar factory waste (Organic Fertilizer) Sugar Factory of PT. Kebun Tebu Mas, Lamongan, East Java

No.Lab	No. Field	pH 1:5 H_2O (%)	Gravimetry C-Organic (%)	K Jeldahl N (%)	Wet Harbor (exstract HNO_3 + H ClO_4)				Gravimetry Water Content
					P_2O_5 (%)	K_2O (%)	Ca * (%)	Mg * (%)	
KC 3055	sugar factory waste	7.20	17.46	0.89	0.17	0.70	12.20	0.34	35.50

Source : Lab Soil Analysis. IPB. Agriculture Faculty. Bogor (January 2019)
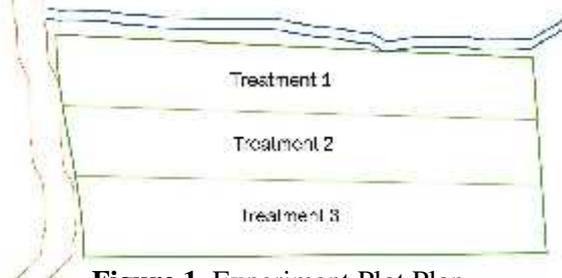*Note : * does not include the scope of Accreditation*

Treatment Use of Fertilizers divided into three, namely:

• **Treatment 1** : Using inorganic fertilizers ZA and NPK at a dose of 400 : 600 kg/ha

• **Treatment 2** : Using inorganic fertilizers ZA and NPK at a dose of 400 : 600 kg/ha and adding 2.5

tons / ha of sugar factory waste.

• **Treatment 3** : Using inorganic fertilizers ZA and NPK at a dose of 50% = 200 : 300 kg/ha and

Extra sugar factory waste 2.5 tons/ha.

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Page | 115

Budi Utomo*, Didit Setyaaji

The trial plot can be presented as follows :

Figure 1. Experiment Plot Plan

Data Processing and Analysis Methods
Data analysis methods used in this study include:
1. Comparison of Growth Analysis Using Data Tabulation.
2. Cost analysis, sugarcane farming income and productivity by calculating the total cost and income from the production of sugarcane seeds.
    a. Cost analysis with calculations
       TC = FC + VC
       Where :
       TC = Total Cost
       FC = Fix Cost
       VC = Variable Cost
    b. Seed production analysis with calculations :
       Harvest Productivity (Ton/Ha) = $\dfrac{\text{Productivity (Ton)}}{\text{Land Size (Ha)}}$
3. Calculate an analysis of business efficiency using the R/C Ratio of the comparison treatment with the addition of sugar factory waste fertilizer.
    R/C ratio = {(P_Q. Q) / (TFC + TVC)}
    Where :
    P_Q = Output price
    Q = Output
    TFC = Total Fixed Cost
    TVC = Total variable costs
4. Calculate a business feasibility analysis using B/C Ratio of comparisons treatment with the addition of sugar factory waste fertilizer.
    B/C = $\dfrac{\textbf{PV Benefit}}{\textbf{PV Cost}}$
    Where :
    B/C = Benefit and Cost
       PV Benefit = Total income for each production
       PV Cost = Total expenditure for each production

3. RESULTS AND DISCUSSION

Profile of Gardens Research Location

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Page | 116

Budi Utomo*, Didit Setyaaji

The research activity was carried out at the location of the Experimental Garden and Production of sugarcane seeds owned by PT Kebun Tebu Mas is a company engaged in the sugar industry. This factory was established in 2011 by obtaining a construction permit in Lamongan Regency. To support the development of sugar cane land as raw material for production, PT Kebun Tebu Mas built a trial garden and seedling production development in Kedungsoko Village, Mantup District, Lamongan Regency. Land that is used in the researcher 's is one of the plots was an experiment and production of seeds owned by PT. Kebun Tebu Mas, the KES209 plot with an area of 0.30 hectares.

Comparison results of the growth of sugarcane seeds.

Table 2. Observation Data Number of Population/Meter^2, at age 2, 4 and 6 BST.

No	Treatment	January	March	May	Average
1	Treatment of 1 NPK 600 kg / ha + ZA 400 kg / ha (Control)	5.67	6.67	6.67	6.33
2	Treatment 2 (Full Dosage of Fertilizer + 2.5 tons of sugar factory waste)	6.00	7.00	7.00	6.67
3	Treatment 3 (1/2 Dosage of Fertilizer + 2.5 tons of sugar factory waste)	5.33	6.00	7.00	6.11

Source: 2019 Primary Data (processed)

The results of observations of population growth tabulations from the three treatments above in the second treatment showed the highest number because using the full dose of fertilizer plus 2.5 tons of sugar factory waste, while the third treatment only used half of the normal population fertilizer dosage at the least. This is likely due to the amount of nutrient intake Macro nitrogen (N) which is less in the third treatment so that it is less stimulating the growth of tillers at the beginning of growth.

Table 3. Plant Height Observation Data, at ages 2, 4 and 6 BST.

No	Treatment	January	March	May	Average
1	Treatment of 1 NPK 600 kg / ha + ZA 400 kg / ha (Control)	93	131	142	122
2	Treatment 2 (Full Dosage of Fertilizer + 2.5 tons of sugar factory waste)	99	137	146	127
3	Treatment 3 (1/2 Dosage of Fertilizer + 2.5 tons of sugar factory waste)	93	130	141	122

Source: 2019 Primary Data (processed)

The observations in table 3. showing that the high growth of plants from three treatments above , the second treatment showed average crop of the most high, 127 cm, because using the full dose of fertilizer (NPK 600 kg/ha + ZA 400 kg/ha) and additional sugar factory waste 2.5 ton/Ha. While the third treatment that only uses half of the normal dose of plant height fertilizer is shorter, while the first and third treatments show the same number. This is because the amount of macronutrient intake is lower in the third treatment so that it does not spur the growth of sugarcane stem segments.

Table 4. Observation Data of Rod Diameter, at ages 2, 4 and 6 BST.

No	Treatment	January	March	May	Average

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

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1	Treatment of 1 NPK 600 kg / ha + ZA 400 kg / ha (Control)	2.60	2.77	2.77	2.71
2	Treatment 2 (Full Dosage of Fertilizer + 2.5 tons of sugar factory waste)	2.67	2.77	2.77	2.73
3	Treatment 3 (1/2 Dosage of Fertilizer + 2.5 tons of sugar factory waste)	2.60	2.70	2.77	2.69

Source: 2019 Primary Data (processed)

The observations in Table 4. tabulation rod diameter of three treatments above are not experiencing diferent significant, especially on the last observation (in May), due to the intake of water availability also affects the growth of sugarcane stalk diameter, whereas for the addition of sugar factory waste treatment there is no effect which means.

1. **Analysis of Cost, Revenue and Productivity Farm Sugarcane**

    a. Analysis of Farm Cost and Income

    According Soemarso (2014), Income is an increase in the number of assets or decreases of liabilities arising from the delivery of goods and services or other business activities during the period. Analysis of the three treatments cost on farm sugarcane seeds with regard to revenues that will be obtained on each treatment. Analysis of costs on businesses farmer sugar cane seeds divided into two fixed costs is the cost of land lease, land preparation, supply of seeds and planting costs as well as costs that do not change over a period of planting seed cane to do the loading and replanting, while the variable costs is operational costs, maintenance and harvesting costs, these costs will stay there every year . The following is an analysis of the cost and income of sugarcane seedlings farming using three kinds of fertilizer treatments.

    1). Analysis of the cost of sugarcane seedlings farming for the first treatment (P1)

    The Total Cost of Farming Analysis for the first treatment (P1) is

    TC = FC + VC

    TC = 2,155,000 + 1,624,500

    TC = 3,779,500

    Analysis of First Treatment Income

Total Cost of seedlings First treatment	3,779,500
Price of seeds (Rp/ton):	700,000
Seedling Production Results First treatment	6.20
First Harvest Treatment	Rp 4,340,000

    PdU = PrU - Bu

    PdU = 4,340,000 – 3,779,500

    PdU = 560,500

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 118

2). Secondary sugarcane seedlings farming cost analysis (P2)

The Total Cost of Farming Analysis for the second treatment (P2) is

TC = FC + VC

TC = 2,155,000 + 1,687,353

TC = 3,842,353

Second Treatment Income Analysis

Total Costs of Seedlings Second Treatment	3,842,353
Price of seeds (Rp/ton):	700,000
Seedling Production Results Second treatment	6.36
Second Harvest Treatment Results	Rp 4,452,467

PdU = PrU - Bu

PdU = 4,452,467 – 3,842,353

PdU = 610,114

3). Analysis of the cost of farming sugar cane seedlings Third treatment (P3)

Total Farm Analysis Cost for the third treatment (P3) is

TC = FC + VC

TC = 2,155,000 + 1,398,036

TC = 3,553,036

Information

TC = Total Cost

FC = Fixed Cost

VC = *Variable Cost*

Analysis of Third Treatment Revenue

Total Cost of the Third Treatment seedlings business	3,553,036
Price of seeds (Rp/ton):	700,000
Third Treatment Seed Production	6.02
Third Harvest Treatment Results	Rp 4,213,440

PdU = PrU - Bu

PdU = 4,213,440 – 3,553,036

PdU = 660,404

Information :

PdU : Operating Income

PrU : Business Acceptance

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 119

BU   : Business Costs

The results of the analysis of the three treatments of sugarcane seedlings cultivation there is a difference in the cost of fertilization, for other cultivation costs there is no difference because it uses the standard cost of sugarcane seeds farming which is carried out in PT Kebun Tebu Mas. Following is the difference in cultivation costs for each treatment.
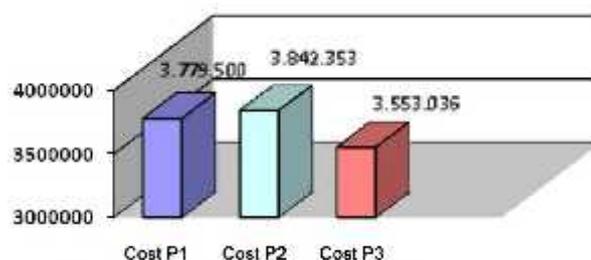
Graph 1. Graph Comparison of farm cost

Graph 1. shows the difference in business costs of the three treatments, there are differences, it is shown that the third treatment is the least compared to the first or second treatment, this is because the first treatment uses a complete dose of chemical fertilizer, while the second treatment uses a complete chemical fertilizer dosage with a price value High chemical fertilizer and added with sugar factory waste. While the third treatment uses only half the dose of chemical fertilizer with addition of sugar factory waste fertilizer whose value is less.

b. Productivity Analysis

Productivity cultivation of seedlings of sugarcane by using inorganic fertilizer with the addition of sugar factory waste is calculated by sampling by taking each tile harvest treatment of 3 samples. Tile size of 5 x 5 meters or 25 square meters to analyze and calculate the weight has harvesting seed cane each tile, from the calculation of yields of seed cane obtained the following data :

Table 5. Calculation of productivity The first treatment (P1)

No	Plot Samples	Total weight (kg)	Information
1	S1P1	158.41	
2	S2P1	158.94	
3	S3P1	147.65	
	Average Amount	155.00	

Note: S = Sample, P = Treatment

Harvest Area in Table 5, above is 25 m², with an average number = 155.00 kg
The area of Harvest P1 is 1,000 m² or 0.10 hectares, so the production is:
= 155.00 x (1.000/25) = 6.200 kg or 6.20 tons

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Productivity / hectare = $\dfrac{\text{Production (Tons)}}{\text{Land Area (Ha)}}$ = $\dfrac{6.20 \text{ Tons}}{0.10 \text{ Ha}}$ = 62.0 Tons/Ha

Table 6. Calculation of productivity Second treatment (P2)

No	Plot Samples	Total weight (kg)	Information
1	S1P2	162.74	
2	S2P2	161.43	
3	S3P2	152.88	
	Average Amount	159.02	

Note: S = Sample, P = Treatment

Harvest Area in Table 6, above is 25 m², with an average number = 159.02 Kg
The area of P2 harvest is 1,000 m² or 0.10 hectares, so the production is:
= 159.02 x (1.000/25) = 6.360.67 kg or 6 . 36 Tons

Productivity / hectare = $\dfrac{\text{Production (Ton)}}{\text{Land Area (Ha)}}$ = $\dfrac{6.36 \text{ Ton}}{0.10 \text{ Ha}}$ = 63.6 Ton/Ha

Table 7. Calculation of productivity Third treatment (P3)

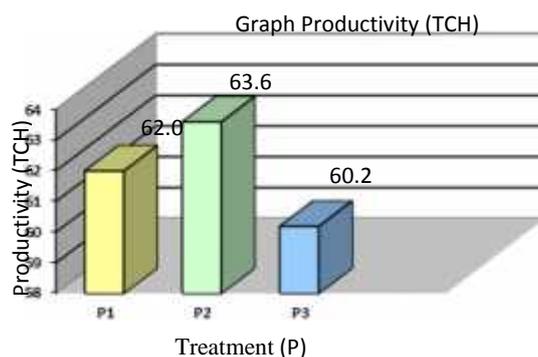| No	Plot Samples	Total weight (kg)	Information
1	S1P3	147.84	
2	S2P3	151.08	
3	S3P3	152.52	
	Average Amount	150.48	

Note: S = Sample, P = Treatment

Harvest Area in Table 7, above is 25 m² = 150.48 kg
The area of P3 harvest is 1,000 m² or 0.10 hectares, so the production is:
= 150.48 x (1.000/25) = 6.019.20 Kg or 6.02 Tons

Productivity /hectare = $\dfrac{\text{Production (Tons)}}{\text{Land Area (Ha)}}$ = $\dfrac{6.0 \; 2 \text{ Tons}}{0.10 \text{ Ha}}$ = 60. 2 Tons / Ha

Graph 2. Comparison of Harvest Productivity in Each Treatment

Graph 2. shows the comparison of sugarcane production above there is a difference, which shows the second treatment gets the most results (63.6 tons / ha) compared to the other two fertilizer treatments , an indication of these results because the second treatment is a treatment using the full dose of normal fertilizer and added to the treatment sugar factory waste form of additional fertilizer, the composition of fertilizers in this case nitrogen (N_2) more than

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Page | 121

Budi Utomo*, Didit Setyaaji

the treatment of other, so that the vegetative growth becomes better (Mastur, 2015). Whereas the third treatment was the least because only received half the normal chemical fertilizer intake.

Calculation of R/C Ratio *(Revenue/Cost)* Business Efficiency Analysis

The data obtained from all three fertilizer treatments above can be in arithmetic treatment Which much better or more efficient economically recommended for cultivation of sugarcane seed.

a. First treatment (P1)

Acceptance	$= P_Q . Q$
	$= 700,000$ x 6 2.000
	$= 4,340,000$
Total Cost	$= TFC + TVC$
	$= 2,155,000 + 1,624,500$
	$= 3,779,500$
R/C Ratio	$= \{(P_Q . Q)/(TFC + TVC)\}$
	$= \{(700,000$ x $62.000)/(2,155,000 + 1,624,500)\}$
	$= 4,340,000/3,779,500$
	$= 1.15$

Calculation Analysis of R/C Ratio effort seed cane by applying the treatment Mining, a is 1.15, which means R/C Ratio > 1, then the treatment is expressed efficient and profitable.

b. Second treatment (P2)

Acceptance	$= P_Q . Q$
	$= 700,000$ x 63.607
	$= 4,452,467$
Total Cost	$= TFC + TVC$
	$= 2,155,000 + 1,687,353$
	$= 3,842,353$
R/C Ratio	$= \{(P_Q . Q)/(TFC + TVC)\}$
	$= \{(700,000$ x $63.607)/(2,155,000 + 1,687,353)\}$
	$= 4,452,467/3,842,353$
	$= 1.16$

Calculation Analysis of R/C Ratio effort seed cane by applying a second treatment is 1.16, which means R/C Ratio > 1, then the treatment is expressed efficient and profitable for doing business farmer seed cane.

c. Third treatment (P3)

Acceptance	$= P_Q . Q$
	$= 700,000$ x 60.192
	$= 4,213,440$
Total Cost	$= TFC + TVC$
	$= 2,155,000 + 1,398,036$
	$= 3,553,036$
R/C Ratio	$= \{(P_Q . Q)/(TFC + TVC)\}$
	$= \{(700,000$ x $60.192)/(2,155,000 + 1,398,036)\}$
	$= 4,213,440/3,553,036$
	$= 1.19$

Information :
P_Q = Output price
Q = Output

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

TFC = Total Fixed Cost
TVC = Total variable costs
Calculation Analysis of R/C Ratio effort sugarcane seeds by applying Asses treatment A is 1.19, which means R/C Ratio > 1, then the treatment in otherwise efficient and profitable for doing business farmer sugarcane seeds.

The third outcome after treatment were analyzed using the R/C Ratio has gained value the efficiency of the business of each treatment to compare the treatment of the most efficient of the three following treatment are presented in chart 3.
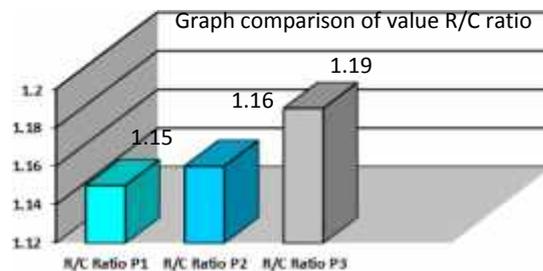
Graph 3. Comparison of the results calculation R/C Ratio

The comparison respectively each treatment all treatment otherwise efficient and profitable for the business right, but the treatment of the third (P3) showing value R/C Ratio most high or most large, so the rated 3rd treatment the most efficient and gain profits the highest if used as a fertilizer treatment in the sugarcane seeds business.

Calculation of B/C Ratio *(Benefit / Cost)* **Business Feasibility Analysis**

Analysis that is used to determine whether farming is carried out properly and can be continued for the following year needs to be done with the *Benefit and Cost Ratio* (B/C Ratio) calculation so that business analysis can be known on the three treatments whether it is feasible to continue and which treatments are considered the most feasible and more good to proceed on sugarcane seeds farming. Sugarcane cultivation is an annual crop with a one-time cultivation system and can be harvested as much as 4 times with a parasitic system so that for the calculation of B/C Ratio it is assumed that the sugarcane seedlings are harvested for 4 times, assuming the second to fourth harvest with cost and same result. Calculation of B/C Ratio is done as follows:

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 123

Table 9. Calculation of B/C First Treatment Ratio (P1)

3rd year	Cost	Benefit	DF 10%	PV Cost	PV Benefit	B/C Ratio
1	3,779,500	560,500	1	3,779,500	560,500	0.15
2	1,624,500	2,715,500	1	1,624,500	2,715,500	0.61
3	1,624,500	2,715,500	1	1,624,500	2,715,500	0.85
4	1,624,500	2,715,500	1	1,624,500	2,715,500	1.01
	PV			8,653,000	8,707,000	1.01

Source: 2019 Primary Data (processed)

$$\text{B/C Ratio} = \frac{\text{PVBenevit}}{\text{PVCost}} = \frac{8,707,000}{8,653,000} = 1.01$$

Table 9. explained that results Analysis B/C Ratio shows value B/C Ratio in the first year to the third year showed results below 1 or less than 1 (B/C Ratio < 1), then the efforts of farmers sugarcane seeds it is not worth the effort , because it loses. Meanwhile, in the fourth year showed that the results of the value of B/C Ratio = 1.01 or more large than 1 (B/C Ratio > 1), then the efforts of farmers sugarcane seeds are starting a profit in the fourth year and well worth the effort, that is to say the fourth year of the new entrepreneurs will get benefits from his farming business.

Table 10. Calculation of B/C Second Treatment Ratio (P2)

3rd year	Cost	Benefit	DF 10%	PV Cost	PV Benefit	B/C Ratio
1	3,842,353	610,113	1	3,842,353	610,113	0.16
2	1,687,353	2,765,113	1	1,687,353	2,765,113	0.61
3	1,687,353	2,765,113	1	1,687,353	2,765,113	0.85
4	1,687,353	2,765,113	1	1,687,353	2,765,113	1.00
				8,904,413	8,905,453	1.00

Source: 2019 Primary Data (processed)

$$\text{B/C Ratio} = \frac{\text{PVBenevit}}{\text{PVCost}} = \frac{8,905,453}{8,904,413} = 1.00$$

The observations in Table 10 can be explained that the analysis of B/C Ratio shows value B/C Ratio in the first year to the third year showed results below 1 or less than 1 (B/C Ratio < 1), then the efforts of farmers sugarcane seeds is not worth the effort, because it loses money. Meanwhile, in the fourth year showed that the results of the value of B/C Ratio = 1.00 or (B/C Ratio = 1), then the efforts of farmers sugarcane seeds are otherwise no profit and no loss or experiencing a breakeven, meaning that in the fourth year entrepreneur has not receive benefits of enterprises farming, so it is stated in the second treatment entrepreneurs can still stick to his efforts when employers can reduce the operating costs of cultivation.

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Page | 124

Budi Utomo*, Didit Setyaaji

Table 11. Calculation of B/C Third Treatment Ratio (P3)

3rd year	Cost	Benefit	DF 10%	PV Cost	PV Benefit	B/C Ratio
1	3,553,036	660,404	1	3,553,036	660,404	0.19
2	1,398,036	2,815,404	1	1,398,036	2,815,404	0.70
3	1,398,036	2,815,404	1	1,398,036	2,815,404	0.99
4	1,398,036	2,815,404	1	1,398,036	2,815,404	1.18
				7,747,144	9,106,616	1.18

Source: 2019 Primary Data (processed)

$$\text{B/C Ratio} = \frac{\text{PVBenevit}}{\text{PVCost}} = \frac{9,106,616}{7,747,144} = 1.18$$

According Damaijati, E. (2012), B/C Rasio an analytical method to measure the feasibility of using acceptance ratio (*revenue*) and cost. Table 11. explained that results Analysis B/C Ratio shows value B/C Ratio in the first year to the third year showed results below 1 or less than 1 (B/C Ratio < 1), then the efforts of farmers sugarcane seeds it is not worth the effort , because it loses. Meanwhile, in the fourth year showed that the results of the value of B/C Ratio = 1.18 or more large than 1 (B/C Ratio > 1), then the efforts of farmers sugarcane seeds are starting a profit in the fourth year and well worth the effort , so that it can be stated attempt treatment third is still effective but only in the fourth year new entrepreneurs will get benefits from their business. After testing the calculation of the B/C Ratio of the business for the following 4 years, a comparison chart of the three treatments is presented.

Comparison Benefit Cost Ratio
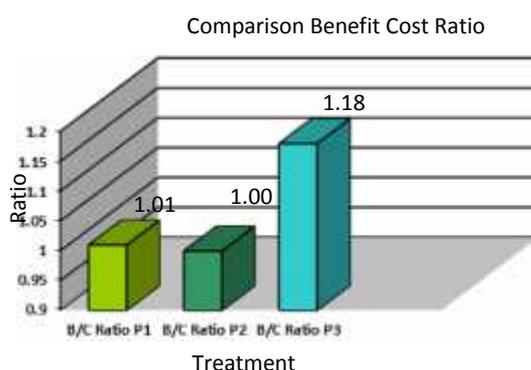
Graph 4 . Comparison of Seed Business Feasibility for 4 years

The results of the comparison of each treatment of all treatments are still feasible to run as a business, but the third treatment (P3) shows the highest value of B/C Ratio so that the third most efficient treatment is used as a continuation of sugarcane seeds treatment business.

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Page | 125

Budi Utomo*, Didit Setyaaji

4. CONCLUSION

1. The differences in the growth of sugarcane seeds in dry land by using inorganic fertilizers and the addition of sugar factory waste are :

   a. The number of stem populations in the first treatment (P1) with an average value of 6.33 stems/meter^2 is smaller than the second treatment (P2) with an average value of 6.67 stems/ meter^2, but greater than the third treatment (P3) with an average value averaging 6.11 stems/ meter^2

   b. The heigh plant in the first treatment (P1) obtained the same value with the treatment to three (P 3) is to average 122 cm, while treatment to two (P 2) high growth of plants most, namely the value of 127 cm.

   c. The rod diameter in the second treatment (P2) produced the highest average value of 2.73, while in the first treatment (P1) the average value was 2.71 cm and the third treatment (P3) with an average value of 2.69.

2. The different farming analysis in the three treatments shows that :

   a. The first treatment (P1) uses a standard fertilizer dose without the addition of other fertilizers with a total cost of Rp 3,779,500, - producing a production of 62.0 tons/ha, the production results are second.

   b. The second treatment (P2) using the same dose of fertilizer plus sugar factory waste with a greater total cost of Rp 3,842,353, - produced a production of 63.6 tons/ha, the production showed the highest results, ranking first.

   c. The third treatment (P3) requires a total cost of at least Rp 3,553,036, - because it only uses half the dose of chemical fertilizer plus sugar factory waste fertilizer, so the third treatment is the most efficient treatment in the sugarcane seed business, with a production yield of 60.2 tons/ha. this third treatment showed the smallest results, but not significantly different from the first treatment and the second treatment.

3. Value R/C Ratio *(Revenue and Cost)* shows treatment of third (P3) is most efficient and profitable in the effort sugarcane seeds for getting R/C Ratio most large compared with other treatments to value ratio of 1.19 , while the treatment of unity (P1) ratio value 1.15 and second treatment (P2) ratio value 1.16.

4. Value B/C Ratio *(Benefit and Cost Ratio)* indicates the treatment the third (P3) is most feasible in the effort sugarcane seeds, because getting B/C Ratio most large compared with

Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 126

other treatments to value ratio of 1.18 , while the treatment of unity (P2) value ratio 1.01 and second treatment (P2) value ratio 1.00.

SUGGESTION

Need further research related to business continuity of sugarcane seedlings by using the addition of sugar factory waste fertilizer to soil fertility in the second year and onwards as well the effect of productivity by calculating the components of seed yield/unit bud.

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Study Additions Sugar Factory Waste On Inorganic Fertilizers Against Seeds Productivity and Sugarcane Farming On dry land

Budi Utomo*, Didit Setyaaji

Page | 127