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Extraction And Optimization Of Extracellular Polysaccharide Production In Spirulina Platensis MK 343101
Nagananthini.G ,Rajapriya.S, Arivuvel amuthan P.S, Sivasankari.S, David Ravindran.A

Spirulina is a blue-green alga belonging to Oscillateriaceae family that typically grows in freshwater lakes, natural springs, and saltwater in subtropical and tropical climates. This blue-green alga is packed with nutrients. It has the outer layer made up of polysaccharide which is water-soluble known as extracellular polysaccharides (EPS), which possess various biological activities such as antitumor, antiviral, antioxidant and anticoagulant activity. Extraction of polysaccharides from Spirulina has been carried out by three different methods viz., hot water extraction, precipitation using ice-cold ethanol and combination of three different solvents methanol: ethanol: chloroform (2:2:2). Exopolysaccharide production was optimized by using Fractional Factorial Design.

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Big Data Clustering: A Comparative Study On Various Clustering Algorithms
G Ashok Kumar

Analysts classify big data as volume, velocity, and variety. Big data analysis explores intelligence from extremely wide variety of dynamic and complex data. Data cleaning is an essential step in big data analytics for easy prediction / decision making / clustering using data organizing tools. Clustering performs grouping of similar data from a population data set so that the data points in the same group show high degree of similarity between them than to the data points of other groups. Big data clustering help researchers to perform dimensionality reduction in complex problems, designing spam filters, identifying fraudulent or criminal behavior, performing Document analysis, classifying network traffic and helping Marketing /Sales analysis. The paper makes analysis of prominent big data clustering techniques in classifying data points belonging to different level of complexities.

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A Survey On Brain Tumor Detection Based On Structural MRI Using Machine Learning And Deep Learning Techniques.
Dhanashri Joshi, Hemlata Channe

Structural Magnetic Resonance Image (MRI) is a useful technique to examine the internal structure of the brain. MRI is widely used for brain tumor detection as it gives a clear picture of brain soft tissues. Brain tumor identification and classification is critical and time consuming task, generally performed by radiologists. Brain tumor of different sizes and shapes can occur in any person. Extraction of exact tumor region and analysis of minute differences is difficult for humans. Digital image processing methodologies like preprocessing, segmentation and classification are useful to clinical experts for proper diagnosis of brain tumor types. This paper focuses on current trends in brain tumor detection using MRI images .Analysis of various state of the art machine learning and deep learning based methods is given. Available datasets and challenges are discussed. This extensive survey will be helpful for future research to develop better decision support system, beneficial to radiologists for accurate brain tumor diagnosis.

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A Study On Prediction Of Health Care Data Using Machine Learning
M. Balamurugan, AVN Krishna, K. Balachandran, J. Bhuvana

Every clinical-decision relies on the doctor's experience and knowledge. Perhaps this conventional practice may look appropriate, but it may lead to unpredictable errors, biases, and maximized costs that may affect QoS (Quality-of-Service) given to patients. To help the doctor to save time, the conventional practice to analyze the data for clinical-decision support has to be updated. Machine Learning (ML) and Data Mining (DM) algorithms have applied to have greater and higher predictions. This paper studies a set of ML algorithms by which clinical-predictions are going to be more appropriate and cost-effective.

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Dynamics Of Soybean Roots In Cane-Soybean Intercropping With Soil Treatment, Disposal Leaves, Organic Fertilizer Humacos
Iskandar Umarie, Bejo Suroso, Oktarina

Soybean demand in Indonesia every year is always increasing, in line with population growth and improved income per capita, so that the necessary supply of imported soybean. One way to increase soybean production through increased productivity of land that is by intercropping. The purpose of this study was to determine the dynamics of soybean roots of sugarcane soybean cropping system. Research conducted at the experimental farm, Faculty of Agriculture, University of Muhammadiyah Jember at December 2018 to May 2019. The research design used Split-Split-Plot consists of 3 doses of fertilizer factor humacos first, second factor cultivation and third factors licking time leaves of sugarcane each treatment was repeated 2 times. As the main plot of land preparation: L1: singkal, L2: singkal-rotary, and L3: singkal-rotary-rotary, subplots disposal cane leaves: P1 = 30 HST, P2: 45 HST, and P3: 60 days after planting, and children swath, dosage of fertilizer humacos: H1: 40 ml humacos + 2 liter water, H2: 80 ml humacos + 4 liters of water, and H3: 120 ml humacos + 6 liters of water. Results Tillage systems singkal-rotary-rotary, shows the number of root nodules most effective time of harvest, whereas in other observational parameters singkal system-rotary-rotary, showed the best trend. Disposal of sugarcane leaves 60 hst show the tendency of the best in all parameters of observation. Giving Humacos 12 l / ha showed the best results on the parameters of the total number of root nodules, the number of nodules during flowering, the number of effective root nodules during harvest, dry weight of effective root nodules, nodule weight and total root length. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 HST, showing the majority of the best trend in all parameters of observation. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a trend towards the best results at the observation parameters. To obtain soybean root growth and development to the maximum in the system of intercropping cultivation of sugarcane-soybean suggest singkal-rotary tillage-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha.

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A Mixed Methods Study Of The Causal Model On Organizational Commitment Among Certified Public Accountants
Joel B. Tan, Gloria P. Gempes

The purpose of this study was to determine the best fit model of organizational commitment among Certified Public Accountants. Employing the explanatory sequential mixed methods, stratified sampling, systematic selection approach, structural equation modeling technique and thematic analysis, data were obtained from 418 CPAs across sectors in Region XI. From the results of the study, it was found that the exogenous variables: self-efficacy, work engagement and quality of life are correlated with the endogenous variable that is organizational commitment. In addition, the results revealed that the standardized model 5 is the best fit model indicating the importance of work engagement and quality of life as predictors of organizational commitment among accounting professionals. These findings were further substantiated through the essential themes: work engagement as predictor of organizational commitment; quality of life as predictor of organizational commitment; affective commitment as observed variable of OC; normative commitment as observed variable of OC; and exclusion of self-efficacy as predictor of OC which were established from the experiences and insights of study participants.

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Need Of Strong Governance Architecture & Structural Interest Rate In Indian Microfinance Industry

Dynamics Of Soybean Roots In Cane-Soybean Intercropping With Soil Treatment, Disposal Leaves, Organic Fertilizer Humacos

Iskandar Umarie, Bejo Suroso, Oktarina

Abstract: Soybean demand in Indonesia every year is always increasing, in line with population growth and improved income per capita, so that the necessary supply of imported soybean. One way to increase soybean production through increased productivity of land that is by intercropping. The purpose of this study was to determine the dynamics of soybean roots of sugarcane soybean cropping system. Research conducted at the experimental farm, Faculty of Agriculture, University of Muhammadiyah Jember at December 2018 to May 2019. The research design used Split-Split-Plot consists of 3 doses of fertilizer factor humacos first, second factor cultivation and third factors licking time leaves of sugarcane each treatment was repeated 2 times. As the main plot of land preparation: L1: singkal, L2: singkal-rotary, and L3: singkal-rotary-rotary, subplots disposal cane leaves: P1 = 30 HST, P2: 45 HST, and P3: 60 days after planting, and children swath, dosage of fertilizer humacos: H1: 40 ml humacos + 2 liter water, H2: 80 ml humacos + 4 liters of water, and H3: 120 ml humacos + 6 liters of water. Results Tillage systems singkal-rotary-rotary, shows the number of root nodules most effective time of harvest, whereas in other observational parameters singkal system-rotary-rotary, showed the best trend. Disposal of sugarcane leaves 60 hst show the tendency of the best in all parameters of observation. Giving Humacos 12 l / ha showed the best results on the parameters of the total number of root nodules, the number of nodules during flowering, the number of effective root nodules during harvest, dry weight of effective root nodules, nodule weight and total root length. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 HST, showing the majority of the best trend in all parameters of observation. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugarcane leaves will give the best results. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a tendency. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a trend towards the best results at the observation parameters. To obtain soybean root growth and development to the maximum in the system of intercropping cultivation of sugarcane-soybean suggest singkal-rotary tillage-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha.

Keywords: Tillage, sugarcane leaf disposal, Humacos, and Intercropping

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1. INTRODUCTION

Soybean (Glycine max (L.) Merrill) is one of the important commodity in terms of providing food, feed, and industrial materials, so it has become a major commodity in agricultural development in Indonesia. Soybean demand in Indonesia every year is always increasing, in line with population growth and improved income per capita, so that the necessary supply of additional soybean imports. One of the causes of low productivity of soybean farmers is the application of technology that is still low, and cultivation techniques (plant populations, amelioration of soil, fertilizer, water management) and control of plant pests (pests, diseases and weeds) are not optimal (Widianto, 2008). One way to increase soybean production through increased productivity of land that is by intercropping. Intercropping is planting two or more types of crops cultivated together on a piece of land and the same time. According Ainun (2010), inter-cropping is intended to use the environment (nutrients, water and sunlight) as well as possible in order to obtain maximum production.

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Research on soybean intercropped with sugarcane is an effort to help increase food production through crop diversification that is by utilizing the empty space on cane land (Soejono, 2003). Roots are important organs in plants mainly to absorb water and nutrients to the growing media. At the time of drought can occur and fisiologi anatomical changes in plants, especially in the root (Cambala, 2011). More plants develop root systems in response to nutrient and drought (Prihastuti. 2013). Soybean plants have roots that forms the taproot -akar branches that grow sideways (horizontal) not far from the surface. If the soil moisture down, the roots will grow in order to be able to absorb nutrients da water. Growth aside soybean plant roots also where the formation of nodules (Suriadi, 2011). The composition of soybean roots are generally very good. Growth of taproot straight into the ground and have many root branches. At the roots of many branches there are nodules contain javanicum Rhizobium bacteria, which have the ability to bind free nitrogen (N2) from the air which is then used to fertilize the soil (Sugiono and Sucahyono, 2012). Nodules formed by Rhizobium when young soybean plants that once shaped root hairs on the main root or root branch. Nodules formed due to stimulation at the root surface which causes the bacteria can get into the root and thrive in it. Which is the root nodule symbiosis between the roots with Rhizobium japonicum serves to bind free nitrogen. But they can also fertilize the soil because it can save the

use of NH3 are available in the soil and supply nitrogen to the soil. Nodule formation is influenced by the availability of nitrogen in the soil, humidity, sanitation, pH and the presence of Rhizobium. Aga soybean plants thrive da has a high production requires nutrient-rich soil, loose and rich in organic matter. To improve fertility, need to add organic matter to the soil which has a C / N ratio is high, causing the case of immobilization of nitrogen (Suriadi, 2011). Results of previous studies fertilizer Balance90 kg Urea + 2 Tons of Organic Fertilizer deliver tangible results in the total number of nodules and the number of effective root nodules. Burangrang deliver tangible results at the age of plant height 35 days after planting (DAP). plant population500,000 plants per ha delivers real results on plant height age of 21, 28 and 35 days after planting (DAP). Balancing interaction with fertilizer varieties, varieties with the population, and the balance of fertilization with the population, had no significant effect on all parameters of observation. Varieties interaction Wilis, Urea 135 kg + 2 tons of organic fertilizer and a population of 500,000 plants per ha (V1P3J1) delivers real results on the number of root nodules effectively and the interaction between Burangrang varieties, urea 90 kg + 2 tons of organic fertilizer and a population of 500,000 plants per ha (V2P2J1) provide real results on the number of effective root nodules (Umarie, et al., 2019). Based on the description above, the writer interested in conducting further research on the dynamics of the roots of soybean (Glycine max (L.) Merrill) in the soil tillage, fertilizer and licking humacos sugarcane leaves on sugarcane-soybean cropping system.

2. METHOD

The experiment was conducted in field trials with a height of 89 meters above sea level, it can reach a distance of 40 cm, with a depth of up to 120 cm. In addition to functioning as a place rely on plant and conveyance of water and nutrients, This study uses Burangrang soybean varieties with a spacing of 10cm x 20cm and a population of 500,000 plants per ha, using a design-Split Split-Plot consists of 3 factors. The main plot of land preparation (L): L1 = singkal, L2 = singkal-rotary and L3 = singkal-rotary-rotary. The subplots disposal cane leaves (P): P1 = 30 HST, P2 = 45 HST, and P3 = 60 HST, and kids swath Dose Fertilizer humacos (H): H1 = 40 ml humacos + 2 liters of water, H2 = 80 ml humacos + 4 liters of water and H3 = 120 ml humacos + 6 liters of water, seta each treatment repeated 2 times. If there are significant differences in safety parameters, proceed to DMRT 5%.Making the Beds, land used is cleaned beforehand from the previous crop marks and then the soil is processed using a hand tractor. Processing in each plot of land in accordance with the treatment. Making the plot was made during the soil tillage. as many as 54 plots. The size of each raised bed 3 mx 1 m by 1 m spacing between beds and the distance between blocks of 50 cm. cultivation cane be done by means of three books perlubang planted with the distance between holes 10 cm and the distance between 100 cm. While the soybean planting done with a spacing of 20 x 10 and each planting hole three soybean seed planted. Watering is done by inundating drainage channel for 15-30 minutes. Excess water is discharged through the sewer. Do not occur until the ground is too muddy or even drought. At the time the plant was 20-30 days after planting, weeding activities performed. The first weeding is done in conjunction with supplementary fertilization activities. Second weeding is done after soybeans finished flowering. Weeding is done by plucking weeds by hand. In addition, do also tilling the soil. Burping done carefully so as not to damage the roots of plants. Pest and disease control are done when there are symptoms of pests and diseases. Observations parameters consist of:1. The total amount of root nodules, 2. The number of effective root nodules, 3. effective root nodule dry weight (g), 4. The total weight of root nodules (g), 5. The length of root (cm), and 6. The dry weight of the root (g).

3. RESULTS AND DISCUSSION

Based on the results of analysis of variance showed that the processing of land (L) had no significant effect on all parameters of observation (number of nodules, dry weight of root nodules effectively, the weight of root nodules effectively, the weight of nodule total, root length and root dry weight, and the number of nodules effective root after the harvest, except in the parameter number of nodules effectively during flowering. the results range test Duncan land treatment system with singkal-rotary-rotary (L3), shows the number of root nodules effectively harvest time ever, the results significantly different tillage singkal-rotary (L2), but not different tillage systems singkal (L1) (table 1)

Table 1. *Duncan's multiple range test and tillage (L)*

Soil Processing (L)	parameter Observation
	Effective number of foci Roots After Harvest
Singkal (L1)	11.64 a
Singkal-Rotary (L2)	9:37 b
Singkal-Rotary-Rotary (L3)	11.66 a

The results of descriptive analysis and tillage (P), to the number of root nodules in total, the number of nodules total sat flowering, dry weight of root nodules effectively, the weight of nodule total, root length and root dry weight, showed that the tillage system singkal-rotary -rotary (L3), show the tendency of the best, except for root length parameter singkal system-rotary-rotary (L3), showed the smallest results (Figure 1).

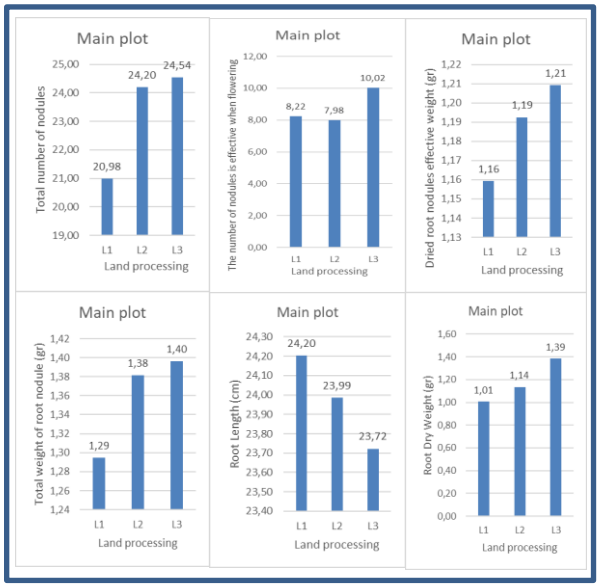

Figure 1. *Effect of Land Processing (L), to the total number of nodules, the number of nodules is effective when flowering, dried root nodules effective weight, the total weight of root nodules, root length and root dry weight.*

Results of analysis of variance Disposal cane leaves (P), the result was no different at all observation parameters (number of nodules, the number of effective root nodules. during flowering, the number of nodules effectively after harvest, the dry weight of nodules effectively, the weight of the effective root nodules, nodule total weight, root length and root dry weight). The results of descriptive analysis disposal cane leaves (P) to the number of root nodules in total, the number of nodules total sat flowering, the number of nodules effectively during harvest, dry weight of root nodules effectively, the weight of nodule total, root length and root dry weight, showing that sugarcane leaf disposal 60 dap (P3) showed the best trend in all parameters of observation, except for root dry weight parameters sugarcane leaf disposal 45 HST

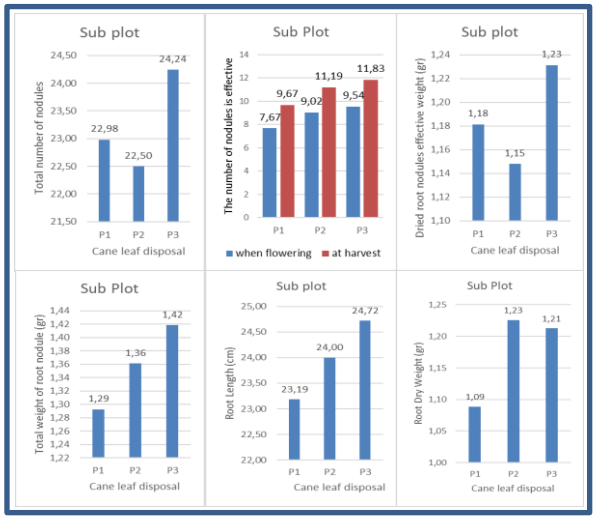

Figure 2*. Effect of Cane leaf disposal (P), to the total number of nodules, the number of nodules is effective when flowering and at harvest, dried root nodules effective weight, the total weight of root nodules, root length and root dry weight.*

showed a trend best results (Figure 2).

While the results of analysis of variance on fertilization treatment Humacos (H) shows the results significantly different until very evident in the number of root nodule, number of nodules effectively during flowering, the number of nodules effectively after harvest, the dry weight of nodules effectively, the weight of root nodules effectively, the weight of nodule total root, root length, while root dry weight parameters were not significantly different. The results of further test multiple range Ducan, showed that giving Humacos 12 l / ha (H3) of the parameter number of root nodules in total, the number of nodules during flowering, the number of nodules effectively during harvest, dry weight of root nodules effectively, the weight of nodule total and long roots, significantly different from the administration Humacos 4 l / ha (H1) and 8 l / ha (2). (Table 2)

Table 2*. Duncan's multiple range test fertilizer Humacos*

Fertilizer Humacos	parameter Observation					
	Total number of foci Root	Effective number of foci roots during flowering	Effective number of foci Roots After Harvest	Effective Root Dry Weights foci	Total Weight of foci Root	long Roots
H1 (4 l / ha)	8.85 b	6:28 b	9:59 b	1:11 b	.:25 b	2.87 b
H2 (8 l / ha)	0.74 b	6:35 b	9.96 b	1:13 b	.:31 b	2.94 b
H3 (12 l / ha	0.13 a	13:59 a	13:13 a	1:32 a	.:52 a	3.10 a

Analysis of variance on the interaction of land at its disposal processing sugarcane leaves (LP) has yet to show significantly different effect on all parameters of observation. But the results of descriptive analysis on the parameters of the number of root nodules in total, the number of nodules total sat flowering, the number of nodules effectively during harvest, dry weight of root

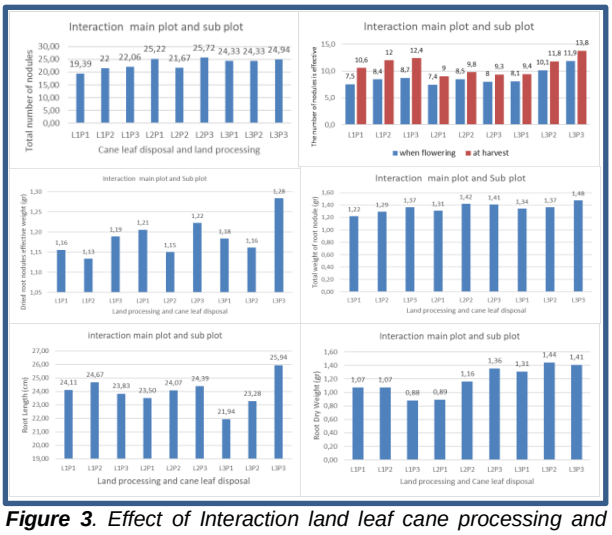

Figure 3*. Effect of Interaction land leaf cane processing and disposal (LP) to the total number of nodules, the number of nodules is effective when flowering and at harvest, dried root nodules effective weight, the total weight of root nodules, root length and root dry weight.*

nodules effectively, the weight of nodule total, root length and root dry weight, showed that the interaction between

the soil tillage singkal -rotary-rotary with sugarcane leaf disposal 60 dap (L3P3), exposing the majority tendency of the best results at the observation parameters (Figure 3) Analysis of variance on the interaction of land with fertilizer processing Humacos (LH) has yet to show significantly different effect on all parameters of observation. But the results of descriptive analysis on the parameters of the total number of root nodules, nodule total number of flowering time, the number of effective nodule during harvest, dry weight of nodules, nodule total weight, root length and root dry weight, shows the interaction between tillage singkal-rotary- Humacos rotary fertilizer with a dose of 12 l / ha, shows a trend towards the best results (Figure 4).

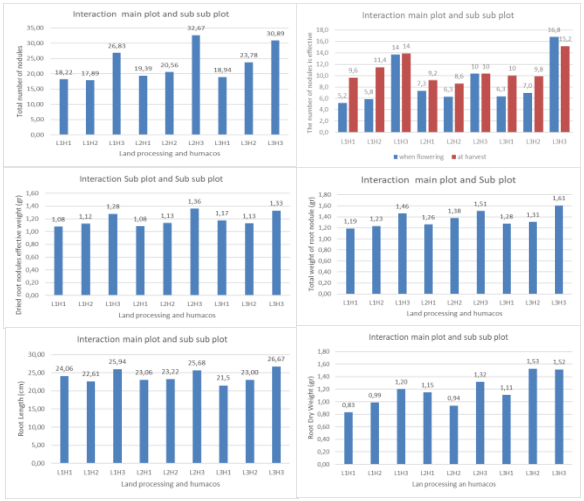

***Figure 4**. Effect of Interaction land processing and humacos (LH) to the total number of nodules, the number of nodules is effective when flowering and at harvest, dried root nodules effective weight, the total weight of root nodules, root length and root dry weight*

Analysis of variance on the interaction disposal sugarcane leaves with fertilizer Humacos (PH) has yet to show significantly different effect on all parameters of observation., Except on the parameters of the dry weight of nodules effectively demonstrated the influence nyta. The results of the analysis of further test multiple range Duncan on the parameters of the dry weight of root nodules effectively, showing the interaction licking cane leaves 30 DAT (P1) with fertilizer Humacos at a dose of 12 l / ha (P1H3), different to the interaction licking cane leaves 30 hst by administration Humacos fertilizer with a dose of 4 l / ha (P1H1) and 30 days after planting sugarcane leaf licking with Humacos fertilizer with a dose of 8 l / ha (P1H2). The results of further analysis of the multiple range test Duncan on the parameters of the dry weight of root nodules effectively, interaction licking cane leaves 45 HST (P2), with fertilizer Humacos at a dose of 12 l / ha (P2H3), different to the interaction licking cane leaves 45 days after planting with fertilizer Humacos a dose of 4 l / ha (P2H1) and licking cane leaves 45 days after planting with fertilizer Humacos with a dose of 8 l / ha (P2H2). The results of the analysis of further test multiple range Duncan on the parameters of the dry weight of root nodules effectively, interaction licking cane leaves 60 DAT (P3), with fertilizer Humacos at a dose of 12 l / ha (P3H3), different to the interaction licking cane leaves 60 hst by administration Humacos fertilizer with a dose of 4 l / ha (P3H1) and 60 days after planting sugarcane leaf licking with Humacos fertilizer with a dose of 8 l / ha (P3H2). licking different interaction of treatment with 45 HST sugarcane leaves with fertilizer Humacos a dose of 4 l / ha (P2H1) and licking cane leaves 45 HST with Humacos fertilizer with a dose of 8 l / ha (P2H2). The results of the analysis of further test multiple range Duncan on the parameters of the dry weight of root nodules effectively, interaction licking cane leaves 60 DAT (P3), with fertilizer Humacos at a dose of 12 l / ha (P3H3), different to the interaction licking cane leaves 60 hst by administration Humacos fertilizer with a dose of 4 l / ha (P3H1) and 60 days after planting sugarcane leaf licking with Humacos fertilizer with a dose of 8 l / ha (P3H2). licking different interaction of treatment with 45 HST sugarcane leaves with fertilizer Humacos a dose of 4 l / ha (P2H1) and licking cane leaves 45 HST with Humacos fertilizer with a dose of 8 l / ha (P2H2). The results of the analysis of further test multiple range Duncan on the parameters of the dry weight of root nodules effectively, interaction licking cane leaves 60 DAT (P3), with fertilizer Humacos at a dose of 12 l / ha (P3H3), different to the interaction licking cane leaves 60 hst by administration Humacos fertilizer with a dose of 4 l / ha (P3H1) and 60 days after planting sugarcane leaf licking with Humacos fertilizer with a dose of 8 l / ha (P3H2). The results of the analysis of further test multiple range Duncan on the parameters of the dry weight of root nodules effectively, interaction fertilization Humacos with the disposal of sugarcane leaves (HP), shows the administration fertilization Humacos a dose of 4 l / ha (H1), did not show significant differences interaction with the disposal of 30 dap (P1), 45 HST (P2) and 60 dap (P3). While the interaction of fertilizer Humacos with a dose of 8 l / ha with disposal leaf 60 dap (H2P3), showed the best results on the parameters of the dry weight of root nodules effectively, these results are significantly different from the interaction of fertilizer Humacos with a dose of 8 l / ha with disposal leaf 45 dap (H2P2), but not significantly different from the interaction Humacos fertilizer with a dose of 8 l / ha with leaf disposal 30 dap (H2P1).

***Table 3**. Duncan's multiple range test*

Interaction	H1 (4 l / ha)	H2 (8 l / ha)	H3 (12 l / ha)
P1 (30 hst)	1.1 bp	1:14 bp	1:31 aq
P2 (45 HST)	1:12 bp	1:07 bq	1:26 aq
P3 (60 hst)	1:12 bp	1:17 bp	1:41 ap

Descriptive analysis on the parameters of the number of root nodules in total, the number of nodules total sat flowering, the number of nodules effectively harvest time, the weight of nodule total, root length and root dry weight, showed that the interaction between the disposal of sugarcane leaves 60 days after planting with fertilizer Humacos with dose of 12 l / ha (P3H3), shows the majority tendency of the best results at the observation parameters (total number of root nodules, nodule total number sat flowering, the number of effective root nodules harvest time, the total weight of root nodules, root length and root dry weight) (Figure 5)

Figure 5. *Effect of cane leaf disposal and humacos (PH) to the total number of nodules, the number of nodules is effective when flowering and at harvest, the total weight of root nodules, root length and root dry weight.*

Figure 6*. Effect of Interaction land processing, cane leaf disposal and humacos (LPH) to the total number of nodules, the number of nodules is effective when flowering and at harvest, dried root nodules effective weight, the total weight of root nodules, root length and dry root weight.*

Analysis of variance on the interaction using the land (L), with the disposal of sugarcane leaf (P) and fertilizer Humacos (H) (LPH) has yet to show the effect of significantly different at every parameter of observation (number of nodules in total, the number of nodules effectively when flowering and when harvest, dry weight of effective root nodules, nodule total weight, root length and root dry weight). But the results of descriptive analysis on the number of nodules in total, the number of nodules effectively during flowering and at harvest, dry weight of root nodules effectively, the weight of nodule total, root length and root dry weight, showed that the interaction between tillage singkal-rotary-rotary (P3) with the disposal of sugarcane leaves 60 DAT (P3) and fertilizer Humacos with a dose of 12 l / ha (L3) (L3P3H3) Results range test Duncan land treatment system with singkal-rotary-rotary (L3), shows the number of root nodules effectively harvest time ever, the results significantly different tillage singkal-rotary (L2), but not different cultivation systems singkal (L1) (table 1) and the results of descriptive analysis and tillage (P), to the number of root nodules in total, the number of nodules total sat flowering, dry weight of root nodules effectively, the weight of nodule total, root length and root dry weight, showed that the soil tillage singkal-system with rotary-rotary (L3), show the tendency of the best, except for root length parameter singkal system-rotary-rotary (L3), show the results of the smallest. This result is presumably because singkal-rotary tillage-rotary (L3), is a perfect ground processing system, thus forming a good soil structure. However, improvements in soil properties singkal-rotary tillage-rotary (L3) can be shown by the increase in value compared to the CEC before planting. CEC value shows the ability of soil to provide nutrients. CEC value of land associated with organic matter content in it (Syekfani 2010 and Prihastuti, 2013), thus the member space for roots and root nodules of soybean plants to grow and develop better. Nodule is a key indicator to detect the occurrence of Rhizobium symbiosis with the host plant. Nodule will be formed if the external factors around the roots support, one of which is the condition of the soil, the soil loose and crumb is ideal soil conditions to grow and develop nodules on soybean plants. Skermann, 1977 and Umarie, et al., 2018, also stated that root nodule growth was highly dependent on environmental factors such as the amount of nutrients, temperature, soil moisture content, and genetic factors. The results of descriptive analysis disposal cane leaves (P) to the number of root nodules in total, the number of nodules total sat flowering, the number of nodules effectively during harvest, dry weight of root nodules effectively, the weight of nodule total, root length and root dry weight, showing that sugarcane leaf disposal 60 dap (P3) showed the best trend in all parameters of observation, except for root dry weight parameters sugarcane leaf disposal 45 HST showed a trend best results. Licking cane leaves is a way to make room for sunlight to reach the canopy of soybean plants that grow crops such as sugar cane. The results showed licking cane leaves age 60 hst showed growth of roots and root nodules of the best, it is suspected at the age of soybean plants require adequate sunlight, it relates to the process of photosynthesis that occurs in soybeans. Rhizobium capable of fixing N2 gas contained in the air and is converted into ammonia (NH3). Ammonia is then transported through the xylem to the leaves to form chlorophyll (Krisnawati and Adi. 2015). The more ammonia present in the leaves so the more chlorophyll formation. High chlorophyll levels will affect the process of photosynthesis in which the higher rate of photosynthesis then assimilate production levels that trans-location phloem

is also high. Assimilates product will be distributed to the entire network of plants for respiration. Photosynthetic rate will also affect the relationship. reciprocity with biological nitrogen fixation. The results of further test multiple range Ducan, showed that giving Humacos 12 l / ha (H3) of the parameter number of root nodules in total, the number of nodules during flowering, the number of nodules effectively during harvest, dry weight of root nodules effectively, the weight of nodule total and long roots, significantly different from the administration Humacos 4 l / ha (H1) and 8 l / ha (2). It is suspected humacos giving 12 liters per ha to more fertile soil, soil texture and structure better, as where in the know that Humacos an organic fertilizer containing humic acid and seaweed extras that serves as revamping ground. Humic material is a material that has the potential to improve soil conditions with the ability to interact with metal ions, oxides and hydroxides, including other contaminants (Trevisan et al., 2010). This is in line with research conducted by Ramadhiana and Juang (2013) which states that the addition of organic material in the plant is able to increase crop production beans, as the organic material has a very good role to improve the physical, chemical and biological soil. Ability nodules to fix nitrogen from the air newly owned at the time the plant was 15-20 HST, hence the addition of nitrogen fertilizer is still required for crop production can be maximized (Irwan, and Wahyudin, 2017 Prakoso, et al., 2018). Descriptive analysis on the parameters of the total number of root nodules, nodule total number sat flowering, the number of effective root nodules during harvest, dry weight of effective root nodules, nodule total weight, root length and root dry weight, showed that the interaction between the soil tillage singkal- rotary-rotary with sugarcane leaf disposal 60 dap (L3P3), exposing the majority tendency of the best results at the observation parameters. This is presumably because the interaction of tillage (singkal-rotary-rotary) at the disposal of sugar cane leaves (60 dap) (L3P3), causing the soil becomes more friable and sunlight can reach into the canopy of soybean plants in sufficient quantities, thus making the roots and root nodules of soybean plants can grow and develop better. According to research Proborini (2011) and Irwan and Wahyudin (2017), Descriptive analysis on the parameters of the total number of root nodules, nodule total number sat flowering, the number of effective root nodules during harvest, dry weight of effective root nodules, nodule total weight, root length and root dry weight, showed that the interaction between the soil tillage singkal- rotary-rotary Humacos fertilizer with a dose of 12 l / ha (L3H3), exposing the majority tendency of the best results among all arameter observations. Friable soil conditions (Singkal-rotary-rotary) and the adequacy of nutrient elements (12 l / ha), causing the roots and root nodules of soybean plants can grow well. Soybeans are known to have the ability to bind the N2 in the air (N forms that are not available to plants) for cooperating with nodules or Rhizobium bacteria in the soil. Nitrogen is then used by the plant to support the growth and development of soybean cycle. Further, nitrogen is absorbed then functioned as a seed formation on plant physiological processes (Fabre and Planchon, 2000 and Amir et al., 2015). Further test results (Table 3) on the same leaf disposal treatment with Humacos different fertilizer, showed that the fertilizer humacos with a dose of 12 liters per ha showed the best results in all parameters of observation. The results of the analysis of further test multiple range Duncan (Table 3) on the parameters of the dry weight of root nodules effectively, interaction fertilization Humacos with the disposal of sugarcane leaves (HP), shows the administration fertilization Humacos a dose of 4 l / ha (H1), did not show significant differences either interaction with the disposal of 30 dap (P1), 45 HST (P2) and 60 dap (P3). While interaction Humukos fertilizer with a dose of 8 l / ha with leaf disposal 60 dap (H2P3), showed the best results on the parameters of the dry weight of root nodules effectively, these results are significantly different from the interaction Humukos other fertilizer. While interaction Humukos fertilizer with a dose of 12 l / ha with leaf disposal 60 dap (H3P3), showed the best results on the parameters of the dry weight of root nodules effectively, these results are significantly different from the interaction Humukos other fertilizer. Descriptive analysis(Figure 5)the parameter number of root nodules in total, the number of nodules total sat flowering, the number of nodules effectively harvest time, the weight of nodule total, root length and root dry weight, showed that the interaction between the disposal of sugarcane leaves 60 days after planting with fertilizer Humacos at a dose of 12 l / ha (P3H3), exposing the majority tendency of the best results at the observation parameters. These results demonstrate that administration of Humacos with a dose of 12 liters per hectare combined with the disposal of sugar cane leaves were like where will give the best results. As we know Humacos which has a main benefit is to improve soil fertility and stimulates plant growth. Humacos major role in soil is its ability to bind metal ions, oxides and hydroxides and releasing them slowly and continually to plants when needed. Specifications humic acid content in humacos 22%, seaweed extract in humacos 7.5% and with a concentrated liquid form and color is black. Humacos other benefits include, improving the physical, chemical and biological soil, increase the availability of phosphate, nitrogen, and macro nutrients are easily absorbed by the roots, reduce the effects of stress drought, increase the effectiveness of organic fertilizer, neutralize contaminants to bind heavy metals, toxicity Aluminum and pesticide residues, accelerate and improve the presentation of seed germination, stimulate roots and green leaves older, increasing the transport of nutrients, cell metabolism Damana photosynthesis, have antioxidant properties and anti-microbial and improve disease resistance (Trevisan et al. 2010). It also Humacos an organic fertilizer containing humic acid and seaweed extras that serves as revamping ground. 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Rhizobium capable of fixing N2 gas contained in the air and is converted into ammonia (NH3) Ammonia is then transported through the xylem to the leaves to form chlorophyll. The more ammonia present in the leaves so the more chlorophyll formation. High chlorophyll levels will affect the photosynthesis process where the higher levels of photosynthetic production levels phloem assimilates were translocated too high. Assimilates product will be distributed to the entire network of plants for respiration. Photosynthetic rate will also affect the relationship. reciprocity with biological nitrogen fixation. This is because the carbon compounds contained in carbohydrates as the main result of photosynthesis required by Rhizobium, if the low-carb so Rhizobium growth was also low (Rivaliati, et al. 2017).

4. CONCLUSION

Tillage systems singkal-rotary-rotary, shows the number of root nodules most effective time of harvest, whereas in other observational parameters singkal system-rotary-rotary, showed a good tendency. Disposal of sugarcane leaves 60 hst show the tendency of the best in all parameters of observation, except for root dry weight parameters sugarcane leaf disposal 45 HST showed a trend best results. Giving Humacos 12 l / ha showed the best results on the parameters of the total number of root nodules, the number of nodules during flowering, the number of effective root nodules during harvest, dry weight of effective root nodules, nodule weight and total root length. Interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 HST, showing the majority of the best trend in all parameters of observation. Interaction between singkal-rotary tillage with fertilizer-rotary Humacos with a dose of 12 l / ha, showing the majority of the best trend in all parameters of observation. Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugar cane leaves were like where will give the best results. interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a trend towards the best results at the observation parameters Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugar cane leaves were like where will give the best results. interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer

Humacos with a dose of 12 l / ha, shows a trend towards the best results at the observation parameters Humacos fertilizer with a dose of 12 liters per hectare combined with the disposal of sugar cane leaves were like where will give the best results. interaction between tillage singkal-rotary-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha, shows a trend towards the best results at the observation parameters

6. ADVICE

To obtain soybean root growth and development to the maximum in the system of intercropping cultivation of sugarcane-soybean suggest singkal-rotary tillage-rotary with sugarcane leaf disposal 60 hst and fertilizer Humacos with a dose of 12 l / ha.

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