Analysis Of Post-Paddy Fields Into Red Chili Cultivation Land In Aek Paing Village Rantau Utara District Labuhanbatu

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Abstract.
Some communities or farmers in North Rantau Sub-district who do not know how to use land or use land for something of higher economic value. A post-rice field land is the most appropriate idea or mindset in the field, by utilizing agricultural land it becomes more useful by providing knowledge about the chemical properties of paddy fields and providing insight that paddy fields require maximum handling, restoration and improvement so that land is productive in agriculture. chili cultivation, so that it can have a good influence on the economy of the surrounding community. This study aims to determine the chemical properties of the soil to utilize red chili plants in Aek Paing Village, Rantau Utara District, Labuhanbatu Regency. This research was carried out in post-rice fields located in Aek Paing Village, Rantau Utara District, Labuhanbatu Regency. The research was carried out on October 18, 2021 until it was completed. The method used in this research is using the free grid survey method. The results of this study found that post-rice fields located in the District of North Rantau, Labuhanbatu Regency, were not well used as red chili farming land. The results of this study indicate that the pH value is low, C-Organic is low, N-total is low, P-Bray II is high, Ca is low, Mg is low, K is high, Na is low, CEC is high.

Keywords: *Soil Chemical Properties, North Rantau District, Red Chili.*

I.   INTRODUCTION

Indonesia is an agricultural country with the majority of the population living as farmers. This is supported by the large number of vacant lands that can also be used as agricultural land, besides that the soil conditions in Indonesia have very good nutrient content so that they can help plant growth properly. One of the leading horticultural products in the agricultural sector in Indonesia is chili. One of the many spice ingredients needed by everyone, namely the community, is chili, so it is not surprising that sales in the market are on a large scale (Nurfalach, 2010 in Sutrisno, 2015) Chili is one of the important agricultural commodities and is widely cultivated in Indonesia, because chili has a specific aroma, taste and color so that it is widely used by Indonesian people as spices and cooking spices. Along with the increasing population, the need for chili in Indonesia is increasing continuously (Soelaiman and Ernawati, 2013).Paddy land is a very important soil that is used to grow lowland rice, either continuously throughout the year or alternately with secondary crops. The term paddy field land is not a taxonomic term for land, but is a general term as we can know, namely forest land, plantation land, agricultural land and so on (Sarwono et al. 2004).Research results Harahap et. al., (2020), One of the signs of rice field degradation is the low content of organic matter and potassium. Organic matter has an important role in determining the ability of the soil to support plants, therefore if the level of soil organic matter decreases, the ability of the soil to support plant productivity can also decrease (Syawal et. al., 2017).Rainfed paddy fields are paddy fields whose water sources depend on falling rainwater. For North Sumatra Province itself, the area of rainfed rice fields is around 149,547 ha (Triharto et al., 2014). Nuryani et al., (2019) providing nutrients through proper fertilization according to soil and plant nutrient needs because excessive will result in decreased soil quality, and will cause poisoning for these plants.

Macro-nutrients that are needed by plants are in larger amounts than micro-nutrients. The plant tissue is larger and the nutrient content is also different depending on the type of nutrient, plant type, soil fertility or soil type and plant management (Saputra et al., 2018). Rice fields have different soil properties and characteristics. so that the condition of the waterlogged land causes changes in the chemical and physical properties of the soil, resulting in decreased growth and production of rice (Harahapet al., 2020).This study aims to determine the chemical properties of the soil for the cultivation of local chili plants in Aek Paing village, Kec. North Rantau Kab. Labuhanbatu. Several horticultural varieties can be developed in post-rice

fields, the selection of chili varieties is the selection of varieties with high economic value.We can know that utilizing post-rice field land is the most appropriate idea or mindset in agriculture and as a source of income for farmers, by utilizing this land we can reduce the number of imports of cooking ingredients to other countries, especially red chilies.The chemical properties of post-paddy soil are unfavorable land so that we really need to recover and improve it optimally so that it becomes a productive land in the cultivation of red chili plants. Post-rice fields can be used as chili cultivation land, with several steps. Analyzing the chemical properties of the soil in order to change the land that initially could not be used into good land and could be used for the cultivation of red chili plants.

II. METHOD

Place and time of research

This research was carried out in the Research Land in Aek Paing Village, Rantau Utara District, Labuhanbatu Regency. The time of the research was carried out on October 18, 2021 until it was finished. The choice of this place was based on careful consideration that this research area is one of the places where farmers can take advantage of post-rice fields planted with chili or secondary crops. The materials used in this study were 3 soil samples obtained on post-paddy fields. Materials used: Ground drill, hoe, plastic, rubber, paper, stationery, Label Paper, Camera, Global Position System (GPS).

Research Methods

The me thod used in this research is a grid-free survey method with a semi-detail survey level (observation density of 1 sample per 500 meters). The implementation of taking soil samples as many as 3 sample points with a distance of 500 meters in the field using a randomly distributed method with a specified area. Soil samples were taken directly at a depth of 0-20 cm. with the coordinates on the GPS (Global Positioning System). The implementation of taking soil samples as many as 3 sample points with a distance of 500 meters in the field using a randomly distributed method with a predetermined area based on the base map (Rauf and Harahap 2019). Analysis of soil chemical properties was carried out at the Analytical Laboratory of PT. Socfin Indonesia (Socfindo) Kebun Bangun Bandar. Analysis of chemical properties of post-paddy land, namely: pH, N-total, C-Organic, P-BrayII, CEC, K, Mg, Ca, Na.
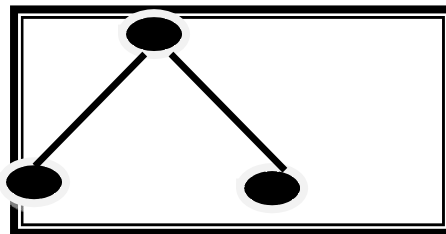

Fig 1. Pattern of Soil Sampling Accompanied by the use of the Coordinate Point application.

Table 1. Data Result of Analysis of Chemical Properties of Soil After Rice Fields Planted with Red Chili

Sampel	Parameter								
	pH	C-organik	N-Total (%)	P- BrayII (ppm)	Ca- dd (me/100g)	Mg-dd (me/100)	K- dd (me/100g)	Na-dd (me/100g)	KTK (me/100g)
A	5,12	2,40	0,13	151,32	1,22	1,53	0,89	0,34	11,43
B	5,08	2,31	0,21	125,62	1,02	0,79	0,77	0,43	13,80
C	4,94	1,45	0,09	68,22	0,30	0,22	0,41	0,19	2,99
Rataan	5,04	2,05	0,14	115,3	0,84	0,84	0,69	0,32	9,40

III. DISCUSSION AND RESULT

Based on the results of the research that the post-rice field soil in Aek Paing Village, Rantau Utara District, Labuhanbatu Regency has several differences in each parameter both in pH, C-Organic, N-total, P-

Bray II, Ca-dd, Mg-dd, K-dd, Na-dd, KTK. The difference in each sample can provide a difference also in the growth of chili plants on the land.

❖ **Soil pH in post-rice fields**

Al and Fe solubility can also be affected by soil pH. At an acidic pH, the solubility of Al and Fe is high as a result at a very low pH it can cause poor plant growth because it is influenced by the pH atmosphere or nutrients that are not as needed, so there are some decreased elemental solutions and the presence of Al and Fe poisoning (Rosmarkam and Yuwono). , 2002).

It can be seen that the three samples analyzed on post-paddy soil, turned out to have different pH content. It turned out that samples A and B almost reached neutral pH where the content value at the point of taking these two samples, which was between 5.5-6.5, was classified as slightly acidic. In contrast to the sampling point C, the pH in sample C is classified as acidic. In this sample, plant growth is not good, where we know the role of soil pH can affect plant growth.

❖ **C-organic soil in post-rice fields**

This is in accordance with the literature of the Ministry of Agriculture (2008) which states that regulating the amount of carbon in the soil increases plant productivity and the sustainability of plant life because it can increase soil fertility and use nutrients efficiently. To increase the organic C content, it is necessary to add organic matter in several ways, for example: reuse of crop residues after composting, application of manure and green manure.We can see that the three samples analyzed on post-paddy fields, turned out to have different C-Organic contents. Samples A, B and C almost reached C-Organic neutral where the content value at the point of collection of these three samples was <4.5 which was classified as very acidic. Acidic soil will cause abnormal plant growth, this is caused by several factors, namely, poisoning of certain elements and the unavailability of some nutrients.

❖ **N-Total post-paddy land**

Nitrogen has a very important role for plants, namely, encouraging rapid plant growth, and a lack of nitrogen will cause stunted growth that is not as desired. ie 0.9-0.21. From the three samples, sample B which has the highest nitrogen content compared to samples A and C, seen in sample B there is a nitrogen content of 0.21%, it is suspected that the content of N (Nitrogen) in the soil is related to the content of organic matter in the soil. The high and low nitrogen content affects the amount of organic matter in the soil, if the N is high then the organic matter in the soil is also high, seen from table 1 the total N content in sample B is 0.21%, the high total N content in the sample B growth in chili plants in this sample is good, leaves on plants look green, shoots on plants are also very abundant, stems are sturdy. Then compared to sample points A and C, the leaves on the chili plants showed yellow leaves and wilted stems and did not look fresh. In contrast to sample B, the plants looked fresh.

❖ **P- BrayII post-paddy land**

P-available levels in post-paddy fields were high, after being analyzed on samples A and B of (151.32 and 125.62). This is due to the fact that the post-rice field was planted intensively and provided intensive phosphate fertilizer. So that it can cause accumulation of phosphate due to its very high intensity. Then the available P in sample C was 68.22 ppm (high), because farmers always apply excessive phosphate fertilizer every planting season, while the P nutrient uptake in plants is low. Adiningsih (2004) states that only about 20% of phosphate is absorbed by plants in paddy fields.

❖ **Ca- dd of post-paddy land**

Ca nutrient calcium in the soil comes from minerals where it is formed in several fractions or dust, for example anortite, limestone, pyroxene, calcite etc. This element also plays a major role in plant growth, where its role is very important for the point of root growth. If there is a deficiency of Ca, the formation and growth of roots can be disrupted and will result in inhibited nutrient absorption. After examining the three samples A, B and C, the Ca content in post-rice fields averaged 1.02% -0.30% and was classified as low. The highest Ca content is located at the 0.30% sampling point where the vegetation around this point is oil palm plants. At this point the chili plants are also better, the roots of the chili plants at this point are also stronger and not brittle, compared to other points.

❖ **Mg-dd post-paddy land**

Magnesium is an activator that plays a very important role in energy transportation in several enzymes in plants. This element is also very dominant in its presence in leaves, especially for the availability of chlorophyll, so the adequacy of magnesium is very necessary to facilitate a process in photosynthesis. The Mg content in these three samples belongs to the low criteria, the average ranges from 0.22-0.79 mg/100kg, where at sampling point B the leaf color of chili plants is greener than at other sample points. At this point, the plant grows well evenly and there is no change in leaf color, for example, the leaves are yellow / yellowed and have brown spots. Soil analysis carried out on post-residential soil on Mg elements needs to be handled, for example by applying pesticides or fertilizers that contain high magnesium.

❖ **K-dd land post-rice field**

Djajadirana (2000) states that the element potassium (K) acts as an element for the formation of protein and carbohydrates and improves the quality of seeds and fruit. Potassium is a mobile nutrient that is absorbed by plants in the form of K ions in the soil. Based on soil analysis from 3 samples taken randomly, it shows that the K content is dominated by the medium criteria as much as 1 sample, namely 0.4-0.5 and the high criteria as many as 2 samples, namely 0.6-1.0. It can be seen in both samples that the element K is very readily available in the soil so that it can be said that it is a good soil.

❖ **Na-dd Land after rice field**

It can be seen after the soil analysis in the three samples A, B and C in table 1 contains low Na around 0.1-0.3. The three samples have low Na that has no effect on the growth of a plant, because sodium in small amounts is needed for plant growth processes, if in excessive amounts it can interfere with plant growth.

❖ **Cation Exchange Capacity (CEC) of post-paddy fields**

In soils with relatively low CEC values, the process of absorption of nutrients by soil colloids does not take place relatively, and as a result these nutrients will be easily washed and lost with water movement in the soil (infiltration, percolation), and in turn, nutrients are not available to humans. plant plants. Soil CEC values are very diverse and depend on the nature and characteristics of the soil itself (Barek, 2013). It can be seen after being analyzed that sample B has the highest pH compared to samples A and C, therefore the growth in sample B is better than the other two samples. Because the three samples had an acidic pH so that the availability of nutrients was not sufficient for plants in the growth process. It can be seen that samples A and C are sample points that are not good enough so that it will cause inhibition of a plant.

IV.   CONCLUSION

Based on the study of the chemical properties of post-paddy soil in Aek Pain Village, Kec. North Rantau, pH is classified as acidic, C-organic is low, N-total is low, P-Bray II is very high, Ca is low, Mg is low, Potassium is high, Na is low, CEC is high. From the results of the analysis of the soil properties, the status of soil fertility is low, high and very high. Therefore, the results of the analysis of the nature of this soil indicate that the post-rice field soil is not good for red chili cultivation.

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