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SUITABILITY ANALYSIS OF TOBACCO CULTIVATION TECHNIQUE IN NAGARI BARUAH GUNUNG

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Abstract

The problem with tobacco farmers in Nagari Baruah Gunung is productivity. Tobacco productivity is below national productivity due to cultivation techniques that do not comply with standards. The research method uses suitability analysis to assess the level of suitability of cultivation techniques used by farmers in Nagari Baruah Gunung. The level of suitability is analyzed using a check sheet based on a Likert scale by comparing farmers' actual and standard cultivation. The research results show that the suitability level of the tobacco cultivation technique is 70%. This means that the cultivation techniques used by farmers are still classified as almost by standards. The stages of cultivation that do not meet standards are planting; fertilization; weeding, watering and loosening. The problems that cause non-compliance with this standard are the close spacing of plants, lack of use of manure and dolomite, inappropriate dosage and type of chemical fertilizer, and insufficient watering and irrigation.

Keywords: Tobacco, Suitability, Cultivation Standard, fertilizer, Likert scale



1. Introduction

Tobacco (*Nicotiana tobacum*) is still the leading commodity for Indonesian plantations, apart from palm oil, coffee, cocoa, tea and spices. Tobacco is an annual plant whose leaves can be harvested in 3-4 months and dried before being marketed.

Tobacco production centers in Indonesia are on the island of Java with an area of 173,000 hectares, and Bali-Nusa Tenggara with an area of 36,000 hectares. Meanwhile, the rest are spread across Aceh, Sumatra, Lampung, West Java, Central Java, East Java and NTB. Sumatra Island is the 3rd region that has the highest production, namely 5,374 tons. Where the province of North Sumatra contributed the highest, namely 1,737 tons (Directorate General of Plantations, 2022).

Tobacco commodities have made a positive contribution to the country's foreign exchange. In 2020, the total value of tobacco exports was 195.92 million dollars. From the farmers' perspective, tobacco farming is the main source of livelihood and can improve the economy of farming communities in production centers, such as in Sampang Regency, Pamekasan Regency, Magelang City and Limapuluh Kota Regency (Fauziyah *et al.*, 2010; Nuruddin, 2020; Sefrimon, 2018 ; Sumartono, 2015).

However, the most common classic problem experienced by farmers is productivity problems. As a result, the income received by farmers is not optimal. This also applies to tobacco plants. Nationally, tobacco productivity is 1.18 tons/ha. In the Java region, tobacco productivity is 1.12 tonnes/ha, Sulawesi 0.87 tonnes/ha, and Sumatra 0.83 tonnes/ha. The Sumatra region, especially West Sumatra province, has the lowest tobacco productivity, namely only 0.6 tons/ha (Directorate General of Plantations, 2022).

In theory, a decrease in productivity can occur because farmers do not produce efficiently. This

2. Materials and Methods

The analytical method used to answer the research objectives is qualitative descriptive analysis, namely by collecting and analyzing data by paying attention to characteristics, quality and interrelationships between activities. The research was carried out through observation, interviews and documentation of farmers' tobacco cultivation techniques. The number of samples in this research was 30 farmers using the accidental sampling method.

The first stage of this research was to conduct interviews using a questionnaire regarding the suitability of cultivation carried out by farmers with cultivation standards (using cultivation standards obtained from local extension workers). There are six elements of cultivation activities whose suitability will be analysed: preparation of seeds and land; planting process; fertilization; watering, weeding and loosening; pruning; and pest control. The Likert scale was used to confirm the result, as shown in Table 1

shows that there is a mismatch between the actual production obtained by farmers and the maximum production potential that can be produced. This means that the cultivation methods or techniques used by farmers are still not able to provide maximum production results. The cause can occur due to inappropriate cultivation methods, use of inappropriate production inputs, inappropriate maintenance methods, and other factors (Fauziyah *et al.*, 2010).

Cultivation factors play an important role in determining the success of tobacco farming. Tobacco cultivation factors in the form of seeding methods, maintenance processes and harvesting methods influence the quantity of tobacco harvested. Maintenance such as proper fertilization will increase tobacco growth. By optimizing production inputs such as the use of drum fertilizer, chemical fertilizers and the use of pesticides, production can be increased (Pertivi & Arianti, 2013).

Based on survey in tobacco production centers in West Sumatra Province, there was a discrepancy between the tobacco cultivation techniques used by farmers and the proper cultivation standards. Lima Puluh Kota Regency, as the highest tobacco producer in West Sumatra Province, has tobacco productivity that is far from the national average productivity. National tobacco productivity is 1.18 tonnes/ha, while Lima Puluh Kota Regency is only 0.7 tonnes/ha (Central Statistics Agency for Lima Puluh Kota Regency, 2022). Based on the description, this research aims to measure the level of suitability of cultivation techniques used by farmers in Nagari Baruah Gunuang. It is hoped that with this research, it will be obtained to what extent the cultivation carried out by farmers conforms to standards.

Table 1 Likert Scale for Measurement of Tobacco Cultivation Techniques

Scale	Description
0	Not very up to standard
1	Not up to standard
2	Not in accordance with standards
3	Nearly in line with standards
4	Conforms to standards

Based on the results of the assessment for each activity element, the difference value (gap) between the standard and the cultivation carried out by farmers is calculated. The greater the gap value for an activity, the lower the level of suitability and the shortcomings that need to be taken into account. According to Palan

(2007) in Fuah *et al.*, (2023), the suitability is calculated based on the following formula:

$$\text{Level of Suitability} = \frac{Y - X}{Y} \times 100\%$$

Where:

Y = Cultivation techniques according to appropriate standards

X = Actual cultivation techniques used by farmers.

After obtaining the suitability level value, a decision is made to determine the suitability level of the cultivation techniques used by the farmer. Decision making is in accordance with established cultivation standards based on Table 2.

3. Results and Discussion

Tobacco cultivation techniques, if carried out correctly according to standards, will certainly provide better quality and results. The cultivation standards used in this research were sourced from cybex.pertanian.go.id as well as other sources deemed relevant in the form of books and resource persons (experts). According to

Table 2 Standard Values for Determining the Level of Suitability

Scale	Description
0%-34%	Not very up to standard
45%-50%	Not up to standard
51%-65%	Not in accordance with standards
66%-80%	Nearly in line with standards
81%-100%	Conforms to standards

Eka *et al.*, (2021), cultivation factors such as the use of the amount of TSP fertilizer, the amount of ZA fertilizer, the amount of ZK fertilizer, and the amount of pesticides, influence the amount of production. Table 3 shows the gap and suitability values for tobacco cultivation in Nagari Baruah Gunung.

Table 3 Results of Calculation of Gaps and Suitability of Cultivation Techniques to Standards

No	Kegiatan Budidaya	Actual	Standard	Gap	Suitability (%)	Description
1	Seed and land preparation	2,84	4	1,16	71,10	Almost according with standard
2	Planting	2,51	4	1,49	62,75	Not up to standard
3	Fertilization	2,58	4	1,42	64,5	Not up to standard
4	Watering, weeding, loosening	2,49	4	1,51	62,25	Not up to standard
5	Pruning	3,28	4	0,72	82,00	According with standard
6	Pest and deseas control	3,19	4	0,81	79,75	Almost according with standard
Average		2,81	4	1,19	70,25	Almost according with standard

In general, the tobacco cultivation techniques used by farmers are almost in accordance with standards with a conformity level of 70.25%. Of the six cultivation activities, planting had the highest gap after watering and loosening activities.

Seed and Land Preparation

In seed and land preparation, the indicators observed are the way the land is processed, the use of dolomite and manure, and the age at which the seeds are transplanted. The level of conformity in seed and land preparation was 73.25% or almost according to the standard. This means that in the land processing and seed preparation process, the methods used by farmers are almost in accordance with the correct standards. In the land processing process, none of the farmers applied dolomite to the land and only a few used manure as basic fertilizer. Basic fertilization is

carried out by applying 25-30 tonnes/ha of manure accompanied by liming using calcite carbonate or dolomite. On average, farmers only use 2 tons of manure/ha. This amount is far from the standard which should be 25-30 tonnes/ha. This has an impact on low tobacco productivity. According to research by Wahyudi and Abdullah (2019), applying manure at a dose of 30 tons/ha had the highest effect on the leaf area index, wet rice and dry weight of tobacco leaves. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 1.

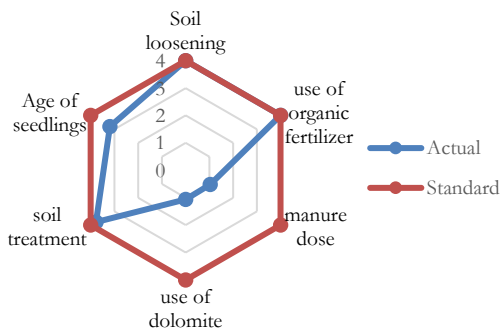


Figure 1 The gap between actual and standard of seed and land preparation

Planting

In the planting process, the indicators used during interviews with farmers were whether there was pruning, plant spacing, planting time and whether or not replanting was carried out. The planting distance used by farmers is still not up to standard. The level of suitability of cultivation techniques in the planting section was only 62.75%. This figure is still far from the standard value which is in the range of 81-100%. This discrepancy is because farmers do not use standard planting distances, namely at least 70 cm x 50 cm and do not prune the seedlings before transplanting. The planting distance used by farmers varies from 50 cm x 50 cm, 30 cm x 40 cm, 50 cm x 100 cm, 60 cm x 60 cm, 70 cm x 70 cm, 40 cm x 90 cm, 30 cm x 60 cm, 60 cm x 100 cm, 30 cm x 30 cm. According to W on the length and width of the leaf. Ulansari (2019), plant population and planting distance influence plant yields. In tobacco, appropriate plant spacing provides perfect lighting during photosynthesis so that it will have a significant effect on the length and width of the leaves. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 2.

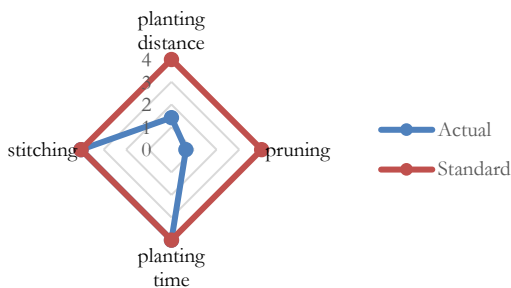


Figure 2 The gap between actual and standard of planting

Fertilization

In fertilization, the fertilization techniques used by farmers are still not up to standard. The level of suitability of fertilization carried out is only 64.5%. This discrepancy is because the fertilizer dosage used by farmers does not meet good standards. The fertilizer needs that farmers ignore are the provision of N and TSP which is far from sufficient, and only a few farmers use KCL fertilizer on their tobacco plants. In fact, many farmers only provide one type of fertilizer, namely urea fertilizer. The average dose of TSP fertilizer used by farmers is around 20-200 kg/ha.

Meanwhile, the standard TSP dose should be 600 kg/ha. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 3.

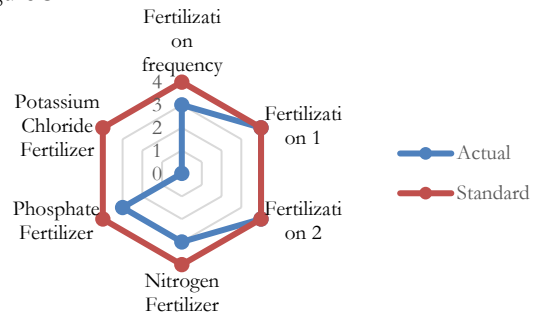


Figure 3 The gap between actual and standard of fertilization

Watering, Weeding and Loosening

In tobacco cultivation techniques, the watering, weeding and loosening techniques carried out by farmers are still not up to standard. The thing that farmers most often ignore is watering or irrigating their tobacco plants. Farmers' land type in general is rain-fed land. Farmers take advantage of the rain to irrigate their gardens. Only 26.6% of farmers water their tobacco plants as needed. The rest is just hoping for rain. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 4.

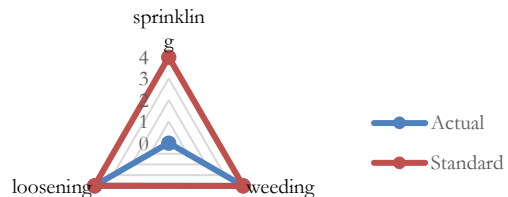


Figure 4 The gap between actual and standard of Watering, Weeding and Loosening

Pruning

In tobacco plant cultivation techniques, the pruning part carried out by farmers is in accordance with standards. The thing that farmers most often ignore is pruning the axillary shoots every three days. These cuts can affect production. Pruning flowers serves to thicken and widen the resulting leaves. Trimming has an important role in determining the quality and productivity of tobacco. Pruning consists of removing flowers (topping) and wiwilan (sirung). Pruning is done by removing 3-4 leaves below the flower. Meanwhile, pruning ketian shoots (wiwilan) is done every 3 days. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 5.

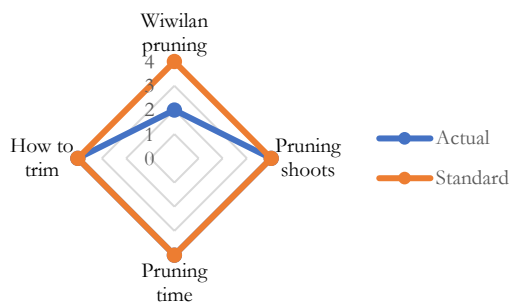


Figure 5 The gap between actual and standard of Pruning

Pest and Disease Control

Pest and disease control carried out by farmers is almost up to standard. This means that pest control has not been carried out properly. Controlling pests and diseases, especially removing and burning diseased plants, is only carried out by some farmers. Most farmers just spray without pesticides, cut infected

4. Conclusions

The conclusion obtained from the research is that the level of conformity for tobacco cultivation in Nagari Baruah Gunung is 70.25%, meaning that tobacco cultivation is still classified as almost in accordance with standards. The stages of cultivation that do not meet standards are planting; fertilization; and weeding, watering and loosening. The problems that cause non-compliance with this standard are close spacing of plants, lack of use of manure and dolomite,

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plants and leave them on the edge of the bed. Tobacco mosaic virus is a virus that causes disease in tobacco. Symptoms include yellow spots on the leaves that spread. One way to control this disease is by removing and burning diseased plants. This aims to prevent transmission of the virus. The level of gap between actual cultivation carried out by farmers and standards can be seen in figure 6.

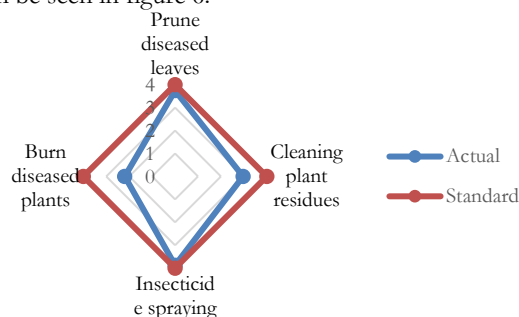


Figure 6 The gap between actual and standard of Pest and Disease Control

inappropriate dosage and type of chemical fertilizer, and insufficient watering and irrigation.

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