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Effect of Nitrogen Fertilization Dosage on Growth and Results Tobacco on Tobacco Plant Cigar (Nicotiana tabacum L.)

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ABSTRACT

This research was to study the effect of N fertilizer doses on the growth, yield and quality of Besuki Na Oogst tobacco plants. The hypothesis put forward is. (1). Application of N fertilizer at certain doses can increase the growth and yield of Besuki Na Oogst tobacco plants. (2). Application of N fertilizer at certain doses can improve the quality of Besuki Na Oogst tobacco plants. The results of the study generally revealed that there were significant differences in the treatment of nitrogen fertilizer doses in the parameters of length, width and area of krosok leaves, production leaf weight parameters and Dekblad and Omblad leaf weights per harvest. On leaf weight production and leaf quality of Dekblad and Omblad, treatment with a fertilizer dose of 50 kg N/ha gave the lowest yield and was significantly different from the other treatments. and treatment of fertilizer doses of 100 kg N/ha to 250 kg N/ha gave results that were not significantly different. Observations made during the study included growth which consisted of leaf length, leaf width, leaf area and number of leaves, harvest observations consisted of leaf gross weight, and post-harvest observations consisted of plant nitrogen analysis, nicotine analysis and quality analysis. The data obtained was tested by analysis of variance (F test) and continued with Duncan's test (p;0.05).

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1. INTRODUCTION

The tobacco plant (Nicotiana tabacum L.) has long been known by the people of Indonesia. Of the various types of tobacco that exist, one type is Besuki tobacco. Besuki Na Oogst tobacco is cigar tobacco which is cultivated by farmers and then processed into pads (Dekblad/Wrapper), wrapping (Omblad/Binder), and mostly in the form of filler production.

Besuki tobacco is a type of cigar tobacco that requires sufficient N fertilization to support rapid growth in order to produce wide and thin leaves. Nitrogen is a macro nutrient for tobacco plants which plays a role in increasing vegetative growth such as stems, leaves, roots and the formation of new cells. Element N is also used for the formation of green leaf substances and increases the ability of plants to absorb other nutrients.

In the Tempeh Lumajang area, tobacco farmers use 300 kg of N fertilizer, while in the Kunir Lumajang area tobacco farmers use fertilizer. It is necessary to research the proper dosage of N fertilizer in order to increase the yield and quality of Besuki Na Oogst tobacco.

Tobacco has a slender figure and medium to slightly tall height. The leaves are oval in shape, the position of the leaves on the stem is rather upright, the distance from one leaf to another is

quite far apart, the width of the leaves is medium to large, the habitus is cylindrical, the thickness of the leaves is thin, the leaves are soft, and have a sharp aroma Tobacco plants can grow in various types of soil. This is because to obtain leaves with the desired quality, each type of tobacco requires a certain type of soil. Each type of tobacco is planted in areas where the type of soil is most suitable for the type in question that requires nitrogen.

Nitrogen is a macro nutrient for tobacco plants which plays a role in increasing vegetative growth such as stems, leaves and roots and the formation of new cells. Nitrogen is absorbed by plant roots in the form of NO3 (nitrate) and NH4 + (ammonium). Types of fertilizers in the form of nitrates, such as Potassium Nitrate (PN), Chilean Potassium Nitrate (CPN) and Potassium Nitrate (KNO3), while the types of fertilizers in the form of ammonium, such as ZA and Urea.

Application of N at low to high doses increases leaf size but decreases body and thickness. Increasing the dose of N fertilizer in low soil moisture conditions produces heavy-bodied leaves, besides causing stronger axillary shoot growth, longer leaf maturity, darker leaf color and it feels hard. To get maximum growth on all leaves, sufficient N elements must be available throughout plant growth. Therefore N dosage regulation is very important for plant growth.

2. METHOD

2.1 Types of research

type of quantitative research by processing secondary and primary data. Primary data which will be obtained from previously available data and processed using tools.

2.2 Research variable

The variable used is the dependent variable with the observed variables including the type of inceptisol soil and rainfall.

2.3 Research design

In this study, the Randomized Block Design method was used using 5 (five) different doses of fertilizer treatment consisting of:

a. P1 = Nitrogen fertilizer dose of 50 kg N/ha
b. P2 = Nitrogen fertilizer dose of 100 kgN/ha
c. P3 = Nitrogen fertilizer dose of 150 kgN/ha
d. P4 = Nitrogen fertilizer dose of 200 kgN/ha
e. P5 = Nitrogen fertilizer dose of 250 kgN/ha

Each treatment was repeated 6 (six) times where in each plot there were 220 plants. Fertilizer application will be carried out in stages, while the application of fertilizer application is in the appendix, and the plot plan

2.4 Sampling Locations.

samples were taken as many as 6 plots in each plot there were 220 plants.

2.5 Time and Location of Research

The research was carried out during the planting period in May 2005 until it was finished and located in Kesilir Village, Wuluhan District, Jember Regency.

2.6 Tools and materials

The tools used are tractors, hoes, gembor, water pump motors, plastic hoses, sprayers, drying warehouses, fermentation warehouses, analytical scales, meters, stop wacth and Teclock brand thickness gauges. The materials used were 30-day-old Na Oogst tobacco seeds, urea, SP-36, and lime. For pest control, insecticides were used, including Ruradan 3G, Confidor, 200 SL, Matador 25 EC and Ridomil MZ fungicide.

2.7 Research procedure

Clearing the land to be used for the experiment was carried out by collecting and removing some of the straw from the land and transporting it to the drying warehouse for smoking and processing the wet leaves into dry leaves (krosok). The remaining straw in the field is spread evenly over the land and burned. After that the land is plowed once and the last is rotated 3 times, and planting, fertilizing and maintenance is carried out then harvesting or picking the leaves of washing feet is done at the age of 45 days, by removing the bottom 1-2 leaves that stick to the ground and after harvesting the plants will Observations were made based on 50 sample plants that were randomly assigned in the field, while chemical analysis of leaves was based on 10 sample plants that were randomly assigned and only one leaf position was measured in detailed plant growth.

2.8 Data Analysis.

Data analysis used the F test at the 5% and 1% level, and continued with the Duncan test at the 5th level.

3. RESULTS AND DISCUSSION

3.1 Research result.

The results of the analysis of giving nitrogen to plants affect the weight of krosok leaves, the length of krosok leaves where each different dose will produce different leaf lengths according to the time and dose given. as well as the width of the two krosols where changes in the leaves are more clearly visible before nitrogen is given to the plants and after it is given but only clearly visible in the vth excerpt. in the first to the 5th quotation the different doses of the plants did not give a significantly different effect between one another. The effect of new fertilizers can be seen in the 6th, 8th, and 9th excerpts, especially on the leaves and stems of plants.

Table 1. The average leaf area of krosok (cm 2M) per section from the application of nitrogen fertilizer doses

Dose fertilizer kg N/ha	Krosok leaf area per section (cm 2)									
	P1	P2	P3	P4	P5	P6	Q7	Q8	Q9	P10
50	643	823	875	902	843	848	826	765	755	682
100	659	836	966	912	964	875	835	854	739	739
150	638	840	926	943	902	936	899	805	805	727
200	632	850	957	953	910	904	901	887	818	740
250	635	824	913	931	894	920	921	879	845	758
	n.t	n.t	Nt	n.t	n.t		Nt			n.t

Description: numbers followed by the same letter are not significantly different in Duncan's 5% test, P : Pluck/harvest

Nicotine levels and total nitrogen from the results of the analysis of various levels of nicotine, it shows that there is a significant effect of the treatment of nitrogen fertilizer doses on nicotine levels in tobacco leaves.

Table 2. Average nicotine content and total nitrogen content from nitrogen fertilizer doses.

Dose fertilizer kg N/ha	Nicotine content and nitrogen content (%)	
	Nicotine levels	N – total
50	1.28 a	3.16
100	1.34 ab	3.36
150	1.39 ab	3.36
200	1.25a	3.32
250	1.54 b	3.39
		Nt

Note: numbers followed by the same letter are not significantly different in Duncan's 5% test.

Nicotine levels, it was found that the treatment with a dose of N fertilizer of 250 kg N ha-1 resulted in high levels of nicotine and the treatment of N fertilizer dose was 100 kg N ha-1 and a dose of N fertilizer was 150 kg N ha-1. 50 kg N ha-1 and 200 kg N ha-1 gave nicotine levels which were not significantly different from the 100 kg N ha-1 fertilizer dose and 150 kg N ha-1, but significantly different from 40 treatments with a dose of 250 kg N ha-1. Meanwhile, at total N levels, high N levels were produced and all the treatments given did not have a significant effect between one treatment and the other. other.

From the results of the analysis of variance in the percentage of Decblad leaves, it shows that there is no significant effect of the dose treatment of Nitrogen fertilizer application on the percentage of leaves, leaf thickness and flammability in Dakblad, omblad and filter per section on tobacco leaves. The results of the percentage of Decblad leaves from the application of different fertilizer doses.

Table 3. Average leaf thickness of deckblad, omblad, filler from nitrogen fertilizer doses.

Dose fertilizer kg N/ha	Leaf thickness (micron)					
	Dekbad		omblad		Fillers	
	dp1	dp9	Op1	Op9	Fp1	Fp9
50	80.20 ab	84.30	87.00	88.80	96.80	91.00
100	79.30 a.m	80.80	85.70	82.00	91.50	87.50
150	80.70 ab	86.70	88.20	84.50	91.00	87.00
200	88.70 b	80.30	85.00	87.20	93.20	88.00

250	86.50 ab	90.00	88.20	88.00	92.30	87.70
		n.t	**n.t**	**n.t**	**n.t**	**n.t**

Note: Numbers followed by the same letters are not significantly different in Duncan's 5% test, DP: Dekblad excerpts, OP: Omblad excerpts. FP : Filler quote.

Treatment with a dose of 200 kg N ha-1 gave results that were not significantly different with a dose of N fertilizer of 50 kg N ha-1, 150 kg N ha-1, and 250 kg N ha-1, and treatment with a fertilizer dose of 100 kg N ha-1 gave significantly different results to the treatment of N fertilizer dose of 200 kg N ha-1 at the time of the first leaf picking of Dekblad.

3.2 Discussion

Growth is the process of increasing dry weight. The increase in size occurs in the roots, stems and leaves. Growth takes place continuously throughout the life cycle and depends on the availability of meristems, assimilate products, hormones and other growth substances and a supportive environment.

Leaves are plant organs that function to carry out the process of photosynthesis with the help of sunlight received by the leaves. The results of the research that has been carried out show that on the 18th leaf length parameter at 62 hst, the treatment with a dose of N fertilizer of 50 kgN/ha is significantly different from the treatment with a fertilizer dose of 200 kgN/ha, while the treatment with a dose of N fertilizer is 200 kgN/ha ha was not significantly different from the other treatments.

This can be caused by differences in the dosage of nitrogen fertilizer at a fertilizer dose of 50 kgN/ha, where the application of 50 kgN/ha nitrogen fertilizer can be used optimally by plants in early to middle leaf growth, but during the growth of late leaves (shoot leaves) plants lack nitrogen elements to maximize the growth of final leaves.

The availability of sufficient nitrogen elements in the soil that has been given can already meet the needs of nitrogen elements needed by plants, especially leaves. By providing a relatively high amount of nitrogen, the amount of nitrogen in the soil also increases, thus affecting the amount of nitrogen that can be absorbed by plants. Krosok leaves are tobacco leaves that have gone through a drying process. In the observation parameters of krosok leaves, there was a significant difference between one treatment and another.

There was also a significant difference in the total weight yield of krosok leaf production, where the fertilizer treatment at a dose of 50 kgN/ha gave the lowest yields compared to the other treatments. This shows that the application of fertilizer doses of 100 kgN/ha which was not significantly different from the application of fertilizer doses of 150 kgN/ha to 250 kgN/ha did not give significantly different results. Means that with the application of fertilizer doses increased from 150 kgN/ha to 200 kgN/ha, it does not increase the weight of krosok leaves. The total N content in the leaves is an important factor that can affect the hardness of cigarette smoke.

Tobacco leaves with high total N content produce spicy cigarette smoke, while tobacco leaves with low total N content produce cigarette smoke with a bland taste. In observing the total N content in the leaves, the treatment of fertilizer doses of 50 kgN/ha to 250 kgN/ha gave no significant effect. Nicotine is formed in the meristem tissue near the root tips, then is translocated to the leaves via the xylem. The tobacco plant synthesizes nicotine from nitrogen. With the low intensity of rain, the humidity in the surrounding environment is low, which affects the development of tobacco plant roots. With low environmental humidity conditions, roots will tend to develop to meet the water needs needed by plants.

4 CONCLUSION

The results of research on the application of N fertilizer dose of 100 kg N ha-1 gave high yields on the weight of krosok leaves with a dose of N fertilizer of 50 kgN/ha giving the lowest total weight of krosok leaves, while the treatment of N fertilizer doses was 100 kgN/ha up to 250 kgN /ha gave results that were not significantly different while the application of N fertilizer did not show any difference in terms of quality parameters which included the amount of total N, yield of deckblad leaf weight, percentage of deckblad leaves, percentage of filler leaves, and parameters of flammability of deckblad leaves, except for the dose of N fertilizer 50 kg N ha-1 which gives the lowest total weight of Dekblad+Omblad.

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There is a need for research on the effect of a combination of campus waste compost and rice straw compost in improving the physical, chemical and biological properties of the soil. It is necessary to increase the observation time for the production of corn directly in the field.

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