

Api Caterpillar Pests Control (*Setora nitents*) in Palm Oil Plantations in East Kutai

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Abstract:- This research is motivated by the problem of oil palm pests that have recently tended to increase and vary. The attack rate of pests, especially Api caterpillars, cause oil palm to lose leaves and ultimately significantly reduce oil palm production.

This study aims to determine the chemical management of caterpillar control and also to find out how much influence it has on oil palm production.

The results showed that the caterpillar attack was very influential on oil palm production, which was carried out at PT. Gemilang Sejahtera Abadi is suitable because it can reduce the population of Api Caterpillars.

Keywords:- Control, Pests, Caterpillars (*Setora Nitens*), Oil Palm.

I. INTRODUCTION

Recently, palm oil pest problems tend to increase and vary. The level of pest attack, especially the palm. The level of pest attack, especially the palm leaf-eating caterpillar pest, is not the same between regions. The palm leaf-eating caterpillar pest attacks cause oil palm to lose leaves and eventually significantly reduce oil palm production (Susanto et al, 2012).

Indonesia is a country that has the potential in oil palm plantations, because it has various advantages. Indonesia has the land suitability desired by oil palm plantations stretching from the east to the west of Indonesia. Indonesia has potential land for oil palm spread across various provinces.

This development was also followed by the changes in pests and diseases along with the increase in cropping generations. Pest, disease and weed problems that were previously considered minor, are now causing serious problems in oil palm plantations.

The importance of controlling the palm leaf-eating caterpillar pest pests in oil palm is because it is one of the most feared pest in oil palm plantations because these caterpillars have a huge detrimental effect on oil palm plants. The palm leaf-eating caterpillar pests attack the leaves of the oil palm, the palm leaf-eating caterpillar pest attacks will have long-term impacts that will affect the quality and quantity of production in the future.

It is better to do it immediately if the economic threshold for api caterpillars is 5 larvae/ fronds and bagworms is 20 larvae/ fronds, the economic threshold value is a reference,

while for making decisions it is necessary to control several factors such as distribution, environmental conditions, and others may be considered.

II. METHODOLOGY

This research was conducted in the East Kutai oil palm plantation. Research is approximately 1 month starting from November to December 2021 which includes preparation of research tools and materials and data collection.

The tools used in this study consisted of stationery, laptops, cellphones. The materials used in this research are primary and secondary data.

In this data collection method, researchers use several methods, namely:

A. Observation

Observation is the process of recording the behavior patterns of subjects (people), objects (objects) or systematic events without any questions or communication with the individuals studied (Indriantoro & Supomo, 1999).

B. Documentation

Documentation is a data collection technique through archives or records contained in the company, these data are in the form of the palm leaf-eating caterpillar pest control reports.

C. Research Procedure

1. Direct observations in the field in the term of activities carried out by assistants and employees when carrying out controls.
2. Field surveys include activities to determine the location that will be used as research materials and images for thesis purposes.
3. Documentation, namely photographing activities in the field at the time of control or observing and recording the research object.

D. Data Processing

After all the data has been collected from the field either through observation or documentation, the next step was to provide analysis. The analysis that the author uses was descriptive qualitative, namely collecting factual data and describing it, descriptive qualitative also describes the phenomena studied in the form of sentences or words not in the form of numbers.

III. RESULT AND DISCUSSION

The result of the study was obtained data on oil palm production and control of caterpillar pests from planning, organizing, implementing, monitoring, and repairing.

Data on oil palm production in 2019 before caterpillar attacks and in 2020 the occurrence of caterpillar attacks that eat oil palm leaves are listed in Table 1 and Table 2.

Table 1 Palm Oil Production Data 2019

year	Large (Ha)	Affected by Leaf Pests			Tonnage (2019)	
		year	Large (Ha)	Plant age	Amount	%
2008	296,10	-	-	11	7.806.760	38,41
2010	132,55	-	-	9	3.840.660	18,89
2013	232,38	-	-	6	4.391.508	21,63
2014	298,92	-	-	5	4.283.388	21,07
total	959,96				20.322.316	100

Table 2 Palm Oil Production Data 2020

year	Large (Ha)	Affected by Leaf Pests			Tonnage (2020)	
		year	Large (Ha)	Plant age	Amount	%
2008	296,10	-	-	12	8.825.799	48,22
2010	132,55	-	-	10	3.435.930	18,77
2013	232,38	2020	30,42	7	3.192.870	17,45
2014	298,92	-	-	6	2.846.505	15,56
total	959,96				18.301.104	100

A. Paml Tree Census

a. The definition of a census is to find the oil palm leaf-eating caterpillar pest problems as early as possible, it is necessary to carry out routine inspections of oil palm plantations. The purpose of the census is to find out how much the symptoms caused by the oil palm leaf-eating caterpillar pests are in the block and control will be carried out if they cross the economic threshold. The benefit of the census is to reduce the impact of the oil palm leaf-eating caterpillar pests on oil palm plantations and find out how many pest populations there are in the block.

Plant assistants and paramedics prepare work plans before carrying out census activities, namely determining the blocks to be censused and conducting a census by checking all the oil palm trees. The number of census employees is 9 people and the target is 3 people/block to prepare tools and materials, stationery and books to record trees affected by new attacks by the oil palm leaf-eating caterpillar pest.

The census was carried out in month 9 with the number of blocks to be censused being 36 blocks with planting years 2008, 2010, 2013 and 2014. The economic threshold for the oil palm leaf-eating caterpillar pests is >5% then control will be carried out and if <5% economic threshold then no control will be carried out.

b. Organizing

1) The assistant is responsible for carrying out the census starting from the morning circle, supervision in the field and checking the results of the census.

2) Plant superintendents are responsible for directing census lines and blocks so that there are no mistakes in census activities.

3) There are 9 census employees who are responsible for the census block and are responsible for filling out the form.

c. Census Implementation

The implementation of the activity was carried out with a total of 9 employees and divided into 3 teams, each team consisting of 3 employees, each team conducted a census of 3 blocks/day. Check each bagong eye that has been determined. Look at the fronds to see if there are caterpillar pest attacks, with the characteristics of the oil palm leaves having holes and if there are, then it counts as 1 attack on the tree.

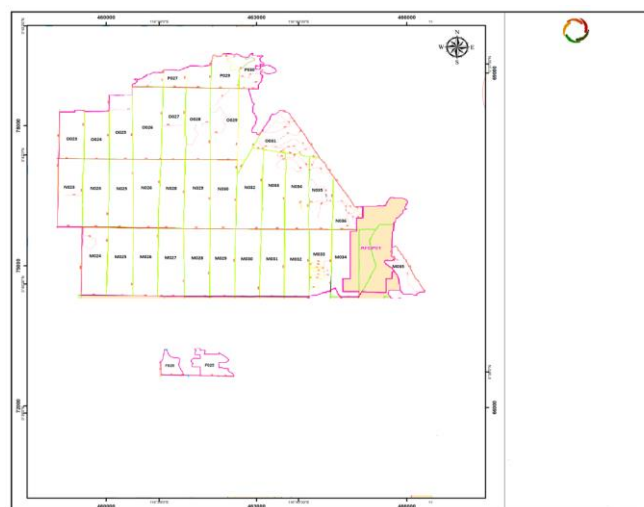


Fig 1 Map of Afdeling 5

From the results of the census conducted by 9 employees, the following targets have been achieved:

Table 3 Target Census of the oil palm leaf-eating caterpillar pest

Day	Number of employees	Census block results
1	9	9 block
2	9	9 block
3	9	9 block
+4	9	9 block
Total block		36 block

From the results of the census that has been carried out, the blocks affected by pests are above the economic threshold, namely >5% and pest control (UPDKS) must be carried out as follows:

Table 4. Results of Census Blocks Affected by Oil Palm Leaf-Eating Caterpillars

Block	Planting area (Ha)	Amount	Number of caterpillars	Threshold	Caterpillar type
N23	28,37	3.858	135	3,49%	<i>Setora nitens</i>
N24	30,57	4.157	178	4,28%	<i>Setora nitens</i>
N25	29,06	3.952	162	4,09%	<i>Setora nitens</i>
N26	30,42	4.137	365	8,82%	<i>Setora nitens</i>
N28	29,61	4.026	158	3,92%	<i>Setora nitens</i>
Total	148,03	20.130	998		

Economic Threshold is a well-known term and is used for making pest control decisions according to the concept of Integrated Pest Management (IPM). It is the density of pest populations that require control measures to prevent the next increase in population.

d. Supervision

Supervision is carried out by assistants and foremen during the census activities so that employees do not pass points that have not been properly censused.

e. Evaluation

The census of caterpillar pests that eat oil palm leaves is in accordance with the Company's Operational Standards, namely by censusing the principal and recording attacks, if there is 1 frond that has api caterpillar attack with the characteristics of the leaf in the frond having holes.

f. Repair

Improvements are made after the results of the evaluation. Improvements will be carried out as much as possible in order to get satisfactory results and the targets that have been determined can be achieved.

B. Control Procedures

a. The oil palm leaf-eating caterpillar pests Control Planning

The Plant Assistant and Mantri prepare a work plan to direct the employees before the control is implemented, in 1 block control by 2 male employees.

In this control is carried out in block N26 with an area of 30.42 Ha. This control performs the fogging technique, the time of implementation technique must be done at night because the wind pressure is not too strong.

b. Organizing

1) Assistants are responsible for activities ranging from briefings, field supervision to checking work results in the Foreman's Activity Book (BKM).

2) The mantri is tasked with attending to employees, giving directions to employees about the work being done and supervising and recording the work of employees in the foreman's activity book (BKM).

3) Employees for control are 1 team with 2 employees. Carry out activities according to the assistant's orders, check all the tools and materials needed after that to the specified block.

c. Control Implementation

Carry out control activities according to orders from the assistant, first check all available tools and materials before heading to the block where control will be carried out, implementation is carried out at 17:00 after briefing and preparing tools and materials, namely: Pulsfog k22, Masks, Gloves, Boots, Decis, pertalite and Diesel fuel.

Standard Operational Procedures (SOP) at PT. Gemilang Sejahtera Abadi Control of caterpillars that eat palm leaves is using fogging. So in 1 fulfog device there are 0.3 liters of decis and 5 liters of diesel serves to generate steam or smoke mixed with decis.

Table 5. Control Results of Oil Palm Leaf-Eating Caterpillars

day	Control time	Block	Control type	Material	Hectar	description
1	16.09.2020	N26	fogging	Decis	10,14	light
2	17.09.2020	N26	fogging	Decis	10,14	light
3	18.09.2020	N26	fogging	Decis	10,14	light

Description: < 5% - Mild
5-10 - Moderate
10 > - Heavy

After controlling, the first evacuation detection is carried out on day 6, if there is no decrease or the affected tree does not improve, then a second control application is carried out on the control, there are also levels after the control is carried out.

d. Supervision

Plant assistants and mantri check again the results of the quality of work of employees in the field, whether it is in accordance with the directions given by the assistant or not. Supervision techniques, namely conducting supervision in the area to be controlled, supervising control activities and monitoring the quality of employee work in accordance with company's SOP.

e. Evaluation

From the results of controlling the palm leaf-eating caterpillar pest at PT. Gemilang Sejahtera Abadi complies with company's SOP using the fogging method.

f. Repair

Repair are conducted after the evaluation. Improvements will be carried out as much as possible in order to get satisfactory results and the targets that have been determined can be achieved.

Data on palm oil production in 2021 after controlling the palm leaf-eating caterpillar pest (UPDKS) using decis can be seen in Table 6.

Table 6 data on palm oil production

year	Large (Ha)	Affected by Leaf Pests			Tonnage (2021)	
		year	Large (Ha)	Plant age	Amount	%
2008	296,10	-	-	13	7.735.800	39,84
2010	132,55	-	-	11	3.640.440	18,75
2013	232,38	2020	30,42	8	4.091.370	21,06
2014	298,92	-	-	7	3.953.140	20,35
total	959,96		30,42		19,420.750	100

Based on the results of control using the fogging method or by spraying smoke on the oil palm trees, the caterpillar pest was in accordance with the company's SOP with a workforce of 2 people with 1 pulsfog K22 device, using Decis poison was declared effective so as to reduce the population of caterpillar pests at PT . Eternal Prosperity. From the production data in 2020 in the 2013 planting year, the contribution produced was only 17.45% and after controlling the caterpillar pest, the production data in 2021 rose to 21.06% and pest control could be declared effective.

In the censused blocks, there were 36 blocks that were attacked by api caterpillars, and 5 blocks that were controlled were only 1 block, namely block N26 because they passed the economic threshold of >5%. At the time of conducting a census among several types of pests (UPDKS), the most censused was the api caterpillar with the type of Setora nitens, which was above the economic threshold >5%.

The caterpillar is a type of caterpillar that eats oil palm leaves which often causes losses in oil palm plantations. The most common types of caterpillar found in oil palm plantations are Setothosea asigna, Setora nitens, darna trima, darna diducta. The species that are rarely found are thosea veatusa from thosea bisura (Hutahaean, 2014).

IV. CONCLUSION

From the research activities that have been carried out in oil palm plantations in East Kutai it can be concluded that:

1. By participating in activities to control palm oil leaf-eating caterpillars (UPDKS), researchers can know and understand the stages of control starting from planning, organizing, implementing, monitoring and repairing.

2. The implementation of palm oil leaf-eating caterpillar pest control greatly affects the production level of the oil palm plantation.

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