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Distribution Patterns And Larval Prevalence Of *Spodoptera exigua* Hubner PEST On Onion (*Allium cepa*) In Pidie District Lambideng

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Abstract:
Background*: The presence of insect pests in a cropping ecosystem will affect cultivation activities because it will directly reduce the quality and quantity of the product produced. If control activities are not carried out, cultivation activities will suffer losses. Spodoptera exigua is one of the important pests that causes farmers not to get maximum production yields and has the ability to spread quickly on shallot plants in the lowlands and highlands.*
Materials and Methods*:This research was conducted in Gampong Lambideng, Simpang Tiga District, Pidie Regency. The research was carried out using a survey method to determine the research location in Gampong Lambideng, Simpang Tiga District, Pidie Regency. Observations were divided into 2 lands with different characteristics in the same location, namely heterogeneous and homogeneous. Sampling was carried out using the diagonal slice method*
Results*: results of the study, namely the distribution pattern of Spodoptera exigua on heterogeneous land obtained IP data = -0.00096 if <0 (uniform) while on homogeneous land obtained IP data = 0.00135. If > 0 (clustered). The prevalence rate of Spodoptera exigua larvae found on heterogeneous land reached 61.24% (weight) while the prevalence rate of Spodoptera exigua larvae found on homogeneous land was 20.24% (low). The types of plants that dominate around shallot plantations come from the Asteraceae family with a total of 4 species.*
Key Word*: Distribution Pattern, Prevalence Level, Plant Type, Spodoptera exigua Larvae, Shallot*

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I. Introduction

The presence of insect pests in a cropping ecosystem will affect cultivation activities because it will directly reduce the quality and quantity of the product produced. If control activities are not carried out, cultivation activities will suffer losses. The losses that will be faced are various factors that affect plant growth such as the level of pest attack, therefore pest control is important to do.

Spodoptera exigua is one of the important pests that causes farmers not to get maximum production results. The use of chemical compounds in shallots tends to be excessive and has a negative impact on the environment[1]. and can cause damage and accumulation of heavy metals in the soil. The presence of Spodoptera exigua is a problem that is very detrimental to shallot farmers. These insects are known as polyphagous pests. Besides shallots, other host plants of Spodoptera exigua are chili, cabbage, tomatoes, spinach, cotton, corn, tobacco, soybeans and so on[2]

Spodoptera exigua is widespread, especially in tropical and subtropical areas, attacking throughout the year and the attack is high in the dry season. The losses caused by the attack of Spodoptera exigua on shallots varied. According to Setiawati (1996) the density of three and five Spodoptera exigua larvae in plant groups can cause yield losses of 32 and 42%, respectively. Spodoptera exigua attack in the vegetative growth phase can result in a yield loss of 57-100% and a decrease in the quality of onion yields, namely small and white tubers[3].

II. Material And Methods

Study Location: This research was conducted in Lambideng Village, Simpang Tiga District, Pidie Regency. Observations were divided into 2 lands with different characteristics in the same location, namely heterogeneous and homogeneous.

Tools and Materials. Thermometer, Lux meter Hygrometer Digital Camera Stationery Raffia rope Soil meter Bamboo benchmark

Subjects & selection method: in this study were all larvae of the pest Spodoptera exigua in the research area and plants around the shallot plant in Gampong Lambideng, Simpang Tiga District, Pidie Regency. The object of this research is the larvae of the pest Spodoptera exigua which is found in every sub-plot of shallot observation in Gampong Lambideng, Simpang Tiga sub-district, Pidie district.

Statistical analysis After the data was collected, the data that had been obtained were tabulated well as a whole and then analyzed by quantitative descriptive analysis, this aims to describe the value of the distribution pattern of the pest larvae of Spodoptera exigua on shallot plants which was carried out by means of the distribution pattern (Morisita Index) and prevalence rates. Distribution Pattern (Morisita Index) Analysis of the distribution pattern of pest larvae can be calculated using the Morisita Distribution Index. The formula for calculating the Morisita Distribution Index is as follows:

$$id^2 = n\frac{(\sum xi^2 - \sum xi)}{(\sum xi)^2 - \sum xi}$$

Description:

Id : Morisita Distribution Index

n : f(x)= the number of observed frequencies

N : Total number of individuals in (n)

x2 : Square Number of individuals per observation point

III. Result

Larvae Distribution Pattern of Spodoptera Exigua The distribution pattern of the pest larvae of Spodoptera exigua on shallot cultivation was divided into two different areas. the first land is heterogeneous land which contains horticultural plants around the shallot plants and the second land is homogeneous which contains many types of grass plants. The distribution pattern of the pest larvae of Spodoptera exigua on heterogeneous land can be seen in Table no 1

Table no 1 Average Pattern of Larvae Distribution of Pests Spodoptera exigua LandHeterogeneous

No.	**Plot**	Number of Individuals (xi)	**xi²**
1	I	23	529
2	II	18	324
3	III	33	1089
4	IV	26	676
5	V	23	529
Quantity		**123**	**3147**
IP = -0,00096 (Uniform Distribution Pattern**)**			

Based on Table no 1, it can be seen that the distribution pattern of Spodoptera exigua in onion cultivation on heterogeneous land, obtained IP data = -0.00096. If it is adjusted to the Morisita category, the distribution includes IP < 0 which means that the distribution pattern of Spodoptera exigua on shallot cultivation is uniform.

The uniform distribution pattern of Spodoptera exigua on shallots on heterogeneous lands was caused by the availability of various hordicultural host plants around shallot cultivation. Host plants can be a place to live or stop that provides food for the pest Spodoptera exigua so that it affects the pattern of distribution. This is in accordance with the statement of, that dispersal patterns can be influenced by the degree of socialization in a population, interactions with other species, availability of resources, and so on. Dominant dispersive factor spreads the members of a population. The distribution pattern of the pest larvae of Spodoptera exigua on shallot cultivation on homogeneous land can be seen in Table no 2.

Table no 2 Average Distribution Pattern of Pest Larvae Spodoptera exigua Homogeneous Land

No.	**Plot**	Number of Individuals (xi)	**xi²**
1	I	11	121
2	II	15	225
3	III	14	196
4	IV	12	144
5	V	11	121
Quantity		**63**	**807**

IP = 0,00135 (Clustered Distribution Pattern)

Based on Table no 2 it can be seen that the distribution pattern of Spodoptera exigua on shallot cultivation on homogeneous land obtained IP = 0.00135. If it is adjusted to the Morisita category, the distribution includes IP > 0 which means that the distribution pattern of Spodoptera exigua on shallots is clustered.

Larvae Prevalence of Spodoptera Exigua . Pests. Based on the results of research that has been carried out, the prevalence rate of Spodoptera exigua larvae found on heterogeneous lands reached 61.24% with the attack level category being severe. Observations were made on shallots aged 27 DAP. The prevalence rate of Spodoptera exigua at 27 DAP was the highest because at that time the development cycle of Spodoptera exigua was the development into larvae. Meanwhile, at 28 DAP, a lot of red onions had grown, so that the availability of food for Spodoptera exigua larvae was sufficient. This is in accordance with Rauf's research in the highest intensity of damage to Spodoptera exigua was at 27 DAP.

Figure no 1

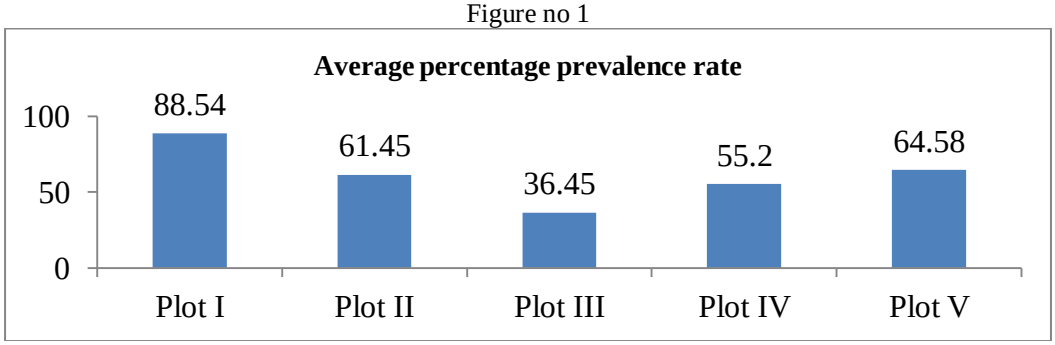
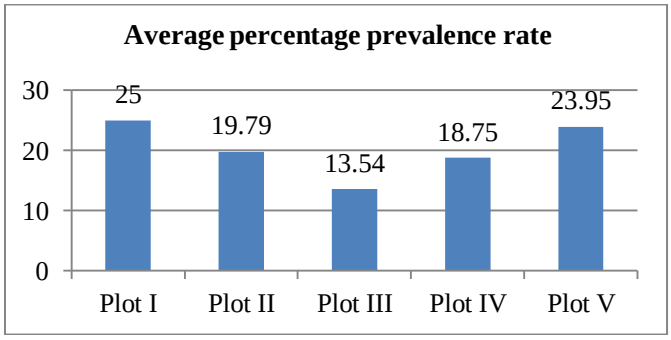


Figure no 1 Diagram of the average percentage difference in larval prevalence Spodoptera exigua on onion plants

Pest attacks found on heterogeneous land are evenly distributed in each plot, this is because these pests have the ability to spread quickly on shallot plants in the lowlands and highlands, besides that these pests attack shallot plants throughout the year, both dry and rainy seasons.

The prevalence of Spodoptera exigua pest larvae in shallot cultivation land on homogeneous land, based on the results of research that has been carried out, namely the prevalence rate of Spodoptera exigua pest larvae found on homogeneous land which is 20.24% including the mild category. Observations were made on shallots aged 45 DAP. The intensity of the prevalence rate of Spodoptera exigua decreases on homogeneous land because at that age the shallot leaves begin to fall and are old. At this time the eggs of Spodoptera exigua are rarely found because in plants with old leaves the availability of food for Spodoptera exigua is little so that the imago of Spodoptera exigua does not lay eggs on old leaves.

The prevalence or damage caused by the pest Spodoptera exigua in the first research location varied data obtained, including 24 the number of plants attacked by the pest Spodoptera exigua from 96 plants observed in plot 1, plot 2 obtained 19 the number of affected plants, plot 3 obtained 13 the number of affected plants, plot 4 obtained 18 and plot 5 obtained 23 plants that were attacked by Spodoptera exigua. The average difference in the prevalence of Spodoptera exigua larvae prevalence in shallot plants can be seen in Figure no 2.
Figure no 2. Graph of Average Difference in Larvae Attack PercentageSpodoptera Exigua On Onion Plants



Canopy Cover : Distribution Patterns And Larval Prevalence Of *Spodoptera Exigua* Hubner Pest On Onion (*Allium Cepa*) In Pidie District Lambideng.

IV. Conclusion

The distribution pattern of Spodoptera exigua on heterogeneous land was obtained IP = -0.00096 (uniform distribution pattern), while on homogeneous land obtained IP = 0.00135 (clustered distribution pattern). The level of damage caused by the larvae of the pest Spodoptera exigua in the shallot plantation of Gampong Lambideng, Simpang Tiga District on heterogeneous land was classified as heavy with a percentage of 61.24% so that it could affect crop yields, while on homogeneous land it was classified as mild with a percentage of 20, 24%.

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