DETERMINATION CONCENTRATIONS OF TUBA ROOT EXTRACT (*DERRIS ELIPTICA* (ROXB.) BENTH) TO CONTROL PEST *LAMPROSEMAINDICATA* F AT SOYBEAN *GLYCINE MAX* (L.) MERRILL.

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ABSTRACT

Lamprosemaindicata F is amajor pest of soybeanplantsthatcause a loss ofproduction ofbetween65.87% . Using thetubaroot extractas an insecticideis expected to reducethe risk ofcroplossbyLamprosemaindicata F. This researchaimedtoobtainthe appropriate concentrationoftubaroot extract(DerrisellipticaBenth) to control*Lamprosemaindicata*F onsoybean*Glycine max* (L.) MerrilResearchconductedexperimentsusing arandomized block design(CBD) withtreatments and 4replications.Datawere statistically analyzedusingAnalysisof varianceandfurther tested by(Duncan's New Multiple Range Test)DNMRT at a rate of5%.Theresultsshowedthat theconcentration of 12.5% extract oftubarooteffectiveforcontrolling*Lamprosemaindicata*F with mortality rateof about51,79%.

Keywords :*Derris elliptica , Lamprosemaindicata, Glicyne max*

A. INTRODUCTION

Soybeans (*Glicyne max*(L.) Merril.)are the third major food commodity after rice and corn. Demand for soybeans for consumption, animal feed (feed) and industrial raw materials from year to year continues to increase (Septiatin, 2012).

The amount of Indonesian soybean production in meeting domestic needs turns out not the same from year to year. Soybean production in 2005, 2006 and 2007 was 808,353, 746,611 and 608,000 tons. The average soybean yield per hectare in Indonesia is still low, unable to meet the needs of 2 million tons so that soybean imports still have to be implemented (Biro PusatStatistik, 2010).

The productivity of soybeans in Indonesia which is achieved at this time is 1.30ton / ha or still around 50% of the potential yield of superior soybean varieties that are recommended (2.00 - 3.50 tons / ha), besides that there is still a low level of soybean productivity in each crop (0.50-1.50 tons / ha) caused by differences in several factors including planting time, level of plant maintenance, pest and disease attack, availability of irrigation water and soil fertility (Adisarwanto, 2014)

Control of *Lamprosemaindicata*F has been carried out by using synthetic chemical insecticides. However, the use of synthetic insecticides can cause some negative impacts such as the emergence of pest resurgence, pest resistance, the second pest explosion, pollution to the environment and disturbances to human health, especially farmers. Therefore, the use of tuba root extract as a vegetable pesticide is expected to be an effective and environmentally friendly alternative control. This study aims to obtain a concentration of the right tuba root extract to control pestsleaf roller *indicata Lamprosema*F on soybean plant(Glicyne*max* (L.) Merrill.

B. MATERIALS AND METHODS

The study was conducted at the Research Faculty of Agriculture Land North Sumatra, With a height of 25 meters above the place sea level Non-factorial randomized block design with 7 treatments and 4 replications The treatment tested was the following tubal root concentrations:

P0 : Control
P1 : Tuba root concentration 2.5%
P2 : Tuba root concentration 5%
P3 : Tuba roots concentration 7.5%
P4 : Tuba roots concentration of 10%
P5 : Tuba roots 12.5% concentration

Data obtained from the results of this study were analyzed statistically using a variety analysis and further tested with DNMRT (Duncan's New Multiple Range Test) at the level of 5%

Implementation ofResearch
Land Preparation

Firstly the soil and compost are prepared to be filled into polybag. Comparison of soil and compost is 2: 1 after which it is stirred evenly and then put into polybags that are 10 kg in size as high as 2/3 parts, then polybags are placed in a 5 mx 5 m field consisting of 4 blocks, each block ad 7 treatment, in each block is placed 1 mx 1 mx 1 m in the number of plots as many as 28 plots (hoods).

planting

after land preparation (polybag). With 2 Polybags in one hood. Then the seeds are ready to be planted, in each polybag planted 2 soybean seeds.

After the seeds are planted polybags are watered so that the soil is moist so the seeds germinate.

Making tuba root extract
Tubaroots that are still freshly washed are then cut into pieces ± 2 cm long and then air dried for 4 days. The root of the tuba is then pounded, and blended into flour. thenweighed according to each treatment. Then add 100 ml of water each, after dissolving and forming a suspension,
900 ml of water is added. This water aims to provide 1000 ml of water for each treatment and added 1 g / liter of detergent.

Insect Infestation
Insect Infestation is *L. indicata*F larvae with 3rd instar and 4th instar, where the larvae are inserted into the hood. The larvae included in the treatment or cupping were 10 larvae

Insecticide Application
The treatment application was carried out at 08.00 WIB, a day afterlarvae was *L. indicata*Finfested on soybean plants with the aim oflarvae to *L. indicata*Fbe able to adapt first. Soybean plants that have been infested withlarvae were *L. indicata*Fsprayed with tuba root extract using a 1000 ml hand sprayer. Each treatment was sprayed until it soaked all the soybean leaf tops.

Parameters

Intensity of Attack
Observation of intensity of pest attack *Lamprosemaindicata*F by using the formula:

$$I = \frac{\sum(n \times v)}{N.Z} \times 100\%$$

Description:
I = intensity of attack,
n= The number of leaves observed in the category of each attack scale,
v= Scale value of the attack category,
N = Number of all observed leaves,
Z = Scale value of the highest attack category.

Larval Mortality (%)
Where larval mortality is calculated using the formula:

$$P = \frac{a}{a + b} \times 100\%$$

Description:
P = Percentage of Death Larvae
a = Larvae that die after application
b = Larvae that live after application

C. RESULTS AND DISCUSSION

The administration of several concentrations of tuba root extract to soybean plants significantly affected Attack Intensity and mortality oflarvae *L. Indicata*after analysis with variance . DNMRT further test results at the level of 5% can be seen in table

Intensity of Attack
Observation of intensity of pest attack *Lamprosemaindicata*F by using the formula:

Table 1. Average attack intensity of *L. Indicata*after application for each observation

TREATMENT	Average Attack Intensity *LamprosemaindicatA* F (%) After Application for Every Time Observation (Day)	
	I	II
P0	45.13 a	56.23 a
P1	40.09 b	44.51 b
P2	36.61 bc	40.51 bc
P3	35.96 c	39.90 bc
P4	33.89 c	36.78 c
P5	33.75 c	36.34 c

Remarks: Figures with the same letter in the same column indicate that the influence is not significantly different at the 5% confidence level DMRT distance

from Table 1 observations after application of the highest attack intensity at P0 (56.23%) and the lowest P6 (33.60%). Observation of both attack intensities increased, because in the first observation after application the number of larvae remaining more than half of each treatment, a few larvae still have the potential to cause damage. Likewise, the observations of the two remaining larvae still exist even though the number of larvae is small, but still has the potential to cause damage, the amount of damage depends on the number of larvae and how active the larvae are to eat leaves after application.

High and low intensity of attack is inversely proportional to the concentration of treatment. The higher the concentration of treatment, the lower the intensity of the attack. Besides that the intensity of the attack is closely related to larval mortality (%). Where in P5 the concentration of 12.5% percentage of mortality of larvae is high so that the intensity of attacks on P5 is lower. In the symptom plants can be seen leaves rolled neatly, the edges or edges of the leaves meet with other leaves or on one leaf, which causes the leaves of the plant to be damaged. This is in accordance with the literature (Muldjono*et al*, 1991) which states that larval attacks are by using the threads to tighten the leaves that will form soybean shoots so that they become one, if the leaves are opened then only the leaves appear.

Larval Mortality (%)

Table 2. Average Mortality Percentage ofLarva*Lamprosemaindicata* F (%) after application for each observation

TREATMENT	Average Mortality Percentage *LamprosemaindicatA Larvae* F (%) After Application for Every Time Observation	
	I	II
P0	0d	0 e
P1	10c	13.89 d
P2	22.5b	25.89 c
P3	25 ab	36.61 b
P4	25 ab	43.75 ab
P5	27.5 ab	51.79 a

Remarks: Figures with the same letter in the same column show that the influence is not significantly different at the 5% confidence level DMRT distance test

Table 2 shows that an increase in the concentration of tuba root extract causes an increase in the mortality of soybean leaf larvae *Lamprosemaindicata* F This is because increasing concentration will increase the accumulation of rotenone compounds in the solution so that the number of rotenon compounds exposed to the abdomen of soybean leaf larvae increases as well. Increased exposure to rotenone compounds in soybean leaf roll larvae resulted in faster die larvae which were seen at the beginning of the larvae death which is shorter, die 1 hour at the highest concentration. Tuba root extract as an insecticide because in the roots contained compounds that are toxic to insects. The results of the Tarumingkeng (1992) test showed that the root of the tube contained rotenone compounds which were toxic to insects. Compounds from tubal root extract that enter the body of insects are contact poisons and work as stomach poisons (Visetson and Milne, 2001).

D. CONCLUSIONS

Extra administration of tubal root with a concentration of 2.5 g / l of water in long bean plants was effective in controlling pests of soybean

lamprosemaindicata F with the highest intensity at P0 (56.23) and larval mortality of P5 51.79%.

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