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The Effect Of Trap Color On The Population Of Walangsangit Pests In Rice Plants (*Oryza sativa* L.)

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ABSTRACT. This study aims to determine the effect of several types of color traps on the population of stink bugs in rice plantations (Oryza sativa L). This study was conducted from June to October 2023 in the rice fields of Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency. This research method uses a non-factorial Randomized Block Design (RAK), with treatments consisting of 7 treatments and 3 replications, namely: W_0: Colorless trap, W_1: Yellow trap, W_2: Pink trap, W_3: White trap, W_4: Green trap, W_5: Blue trap, W_6: Red trap. The results showed that the largest population of stink bugs trapped was in treatment W1 (yellow trap), with a total of 31, therefore the best result among all treatments was W1 (yellow trap).

Keywords: *Brown Planthoppers. Color Traps, Pests, Rice,*

INTRODUCTION

Rice (*Oryza sativa* L.) is a type of short-lived grass 3-4 months, fibrous roots, in the form of clumps with shoots, hollow stem with segments, can reach a height of approximately 100-120 cm. Leaves are alternate, linear with open sheaths. Flowers at the end are in the form of a panicle with small, flat grains, each consisting of one flower. Each flower besides the gluma has one inferior palae, two superior palae, two lodiculae, three stamens and one pistil with one feather-shaped stigma, rice fruit is the rice seed itself, namely white endosperm which is tightly wrapped in water skin. Small base, shape and color depend on the type of rice. Good rice is large, long, white, shiny without a belly (Harjodinomo, 2007).

Some areas in South Tapanuli Regency, precisely in Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency, are mostly farmers cultivating rice plants, pests and diseases in rice plants are one of the important problems that are always faced every rice planting season. This disturbance can cause significant losses, not only to production but also to the quality of the rice itself. As is known, rice is a plant commodity that produces rice. Rice as a food crop is consumed by 90% of the Indonesian population, including in Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency for staple food. The demand for rice as a staple food for the Indonesian population has increased. To meet the above requirements, it is very dependent on many factors, including environmental factors, namely climate and soil and technical factors that need to be given continuous attention to controlling pests and diseases.

Common pests found in rice plants include *Bemisia tabaci* (white lice), *Spodoptera litura* (gray caterpillars), *Pomacea canaliculata* (golden snails), *Rattus argentiventer* (rats), *Melanoplus femurrubrum* (grasshoppers) and the main pest is *Leptocorisa acuta* (Nelly, N, 2011) these pests can be detrimental and even make some rice plants unharvestable. Symptoms caused by these insect pests are spots on grain seeds, grain seeds can be empty due to the suction of this walangsangit pest. The use of adhesive color traps is a simple method to determine the relative size and to detect the early emergence of insects. This method is more efficient than other methods, because the traps directly collect insects that are around the plants. Trap efficiency can be increased by using attractants. Traps like this can be used to monitor pest populations even at low densities, Windra Priwandiputra, et al (2015).

MATERIALS AND METHODS

This research was conducted from June to October 2023 at an altitude of ± 0-1985 meters above sea level in the rice fields of Angkola Sangkunur District in Bandar Tarutung Village. The materials used in this study were rice plants. The tools used in this study were bamboo, plywood, meter, name labels, brushes, transparent plywood, blue paint, yellow paint, red, pink, green, white, tweezers, cameras and computer software and other stationery.

This study used a Non-factorial Randomized Block Design (RAK) consisting of 7 treatments and 3 replications, namely:

W_0: Colorless trap
W_1: Yellow trap
W_2: Pink trap
W_3: White trap
W_4: Green trap
W_5: Blue trap
W_6: Red trap

Research Implementation

Making Traps

The traps are rectangular, measuring 30cm, as many as 7 traps made of plywood. Then the 7 plywoods are painted according to the recommended color after which they are given an antractant (*methylene eugenol*). Then the traps are installed in the planting area at a height of 1 m from the ground surface.

Color Traps With Antractant Adhesive (*methyl eugenol*)

The plywood traps are given a color that is given according to the treatment that will be smeared with antractant until the plywood surface is even.

Installing Traps

The traps are installed in the plant area with a total of 7 pieces. In the middle of the plot/row, 1 color trap according to the height of the rice. The traps are installed 1 day before the study is carried out. The study was conducted once every 3 days with a total of 6 studies. Each plot/row of treatment consists of 320 plants. With a planting distance of 20cm x 25cm, the distance between plots is 25cm. Each time the triplex trap observation was taken and the researcher observed the number of rice planthopper pests trapped in the triplex. After that, the attractant was reapplied, for further research and re-applied.

Variables

Population of rice planthoppers trapped in color traps. The population of rice planthoppers trapped in color traps was counted every day in the afternoon at 14.00-17.00 WIB from each treatment. To determine the number of rice populations in plants, samples of 20 plants/plot were taken and then observed.

RESULTS AND DISCUSSION

Results of Brown Planthopper Pest Observations on Rice Plants.

Based on the results of the analysis of variance from the treatment of using color traps on rice plants in Angkola Sangkunur District, Sihitang Village, it can be seen from the attachment, the treatment of using adhesive color traps has no significant effect on each color trap in the research area in Angkola Sangkunur District. The average number of brown planthopper pests trapped on rice plants can be seen in Table 1.

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Table 1. Average Number of Brown Planthopper Pests (*Leptocorisa acuta*) Trapped on Rice Plants..

	Day After Application										
Treatments	1	2	3	4	5	6	7	8	9	10	Total
W0	1.67	1.67	2.33	2.00	1.33	1.67	2.33	2.00	1.33	1.33	17.66
W1	2.00	2.67	1.67	1.67	2.33	2.67	2.00	2.33	3.66	2.00	23.00
W2	2.00	2.00	1.67	1.67	1.67	2.67	2.00	1.00	1.66	1.66	18.00
W3	1.67	2.33	2.67	2.00	2.00	1.33	2.23	2.00	1.33	1.33	18.99
W4	2.33	3.00	1.67	2.00	2.33	2.33	1.33	1.33	1.33	2.00	19.65
W5	2.33	2.67	2.00	2.67	1.33	2.00	1.00	2.00	1.00	1.00	18.00
W6	3.00	2.00	1.67	2.67	2.00	3.00	1.66	1.33	2.00	1.66	20.99

From Table 1, it is obtained that the total in the treatment that W1 (Yellow) shows the highest total value of 23 compared to all treatments starting from W0, W2, W3, W4, W5, W6 and the lowest total value in the W0 treatment (control/without color), this is suspected that the color preferred by pests is usually contrasting colors such as bright yellow as in the W1 treatment and inversely proportional to the W0 treatment (control/without color). Furthermore, the results of the study showed that the attraction of insects to color is due to the reflection of light in all directions and many plant-eating insects respond positively to the light reflection pattern of the host plant, and this response can be very specific.

In line with the results of the study by Darmosarkoro (2011), stating that the interest of insects in the color yellow tends to be higher, which can be caused by the similarity of the color of the swelling before ripening. The yellow color will provide a stimulus related to the color change in plants before flowering and fruit ripening, where the maximum reflection of the spectrum is monitored by insects.

This is in accordance with the results of the study, it was found that the yellow trap can catch the most brown planthopper pests and the lowest is in the transparent color trap, this shows that the brown planthopper pest insect is more attracted to the yellow color compared to the transparent color, red and green the effect of the trap color will provide the attraction of male *T. absoluta*; we hypothesize that the trap color will be more effective if given pheromones as feedback, reporting a significant difference in the effect of color on catching male insects, the yellow trap is effective for insect traps, in conditions like this there is no difference in color selection based on insect sex.

Insects are more attracted to the color yellow, because yellow has a wavelength range of 424-491 nm and insects have a wavelength range that can be received ranging from 540-600 nm. In addition to the wavelength that can be received by insects, because insects can distinguish colors, possibly due to differences in the retinal cells of the insect's eyes. The stink bug insect uses a number of visual cues or chemical cues to find a host in the form of fruit or vegetables. The suitability of visual cues and chemical cues will cause pests to be more interested in finding their hosts. From the UMS Research and Development research, it is known that yellow traps successfully trap the most stink bugs, followed by white, green and blue traps. The results of this study state that stink bugs are attracted to white and yellow surfaces. According to Kardinan (2003), the use of color traps is very easy, environmentally friendly, does not contain many chemicals and is very easy to apply or implement for farmers to use or implement the use of these color traps among farmers, especially rice farmers. The population of brown planthopper pests has increased due to sufficient food available for their development because in general brown planthoppers attack rice plants when they are milky ripe. Soesilohadi (2011) stated that the abundance of brown planthoppers L. oratorius in rice fields planted with rice showed fluctuations over time. This is influenced by the factor of spraying with insecticides 3-4 times in one rice planting season. When the rice is sprayed with insecticide, the brown planthopper imago will migrate to a place protected from insecticides, namely plants other than rice that are around the rice fields (grass). Color traps are very effective in monitoring or controlling insects, this is in accordance with Windra Priwandiputra, et al (2015) stating that the use of color traps is a simple method to determine the relative size of insects and to detect the early emergence of insects, this method is more efficient compared to the sample unit method, because the traps directly collect insects that are around the plants.

Controlling the use of traps in the fields in Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency, farmers in controlling pests especially Walangsangit use traps, namely color traps, with this control method for the intensity of damage to rice plants can be suppressed, the results of observations in the field show that control using traps is quite effective in controlling Walangsangit pests, some of the functions of using color traps are one of them is to multiply the attention of the Walangsangit more interested.

Walang sangit is more attracted to these contrasting colors than to rice that is flowering until it is ripe. According to Siregar, Z.A. (2007) many types of insects are attracted by the smells emitted by parts of the plant, namely flowers, fruits or other objects. The odorous substance is essentially a volatile chemical compound. Thus, the intensity of damage to rice grains/seeds can be avoided by using the color trap. Viewed from the environment, it does not affect, especially the presence of natural enemies (predators and parasitoids) in the land.

Rice productivity in the land in Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency is generally still low, due to low soil fertility, flooding in the rainy season and drought in the dry season, as well as pest and disease attacks which are important limiting factors. Pest and disease attacks are risks that must be faced and calculated in every plant cultivation effort to increase production according to expectations. This risk is a consequence of every change in the ecosystem as a result of plant cultivation carried out, while climate uncertainty is something that must be accepted as a natural phenomenon. Climate change or uncertainty greatly affects the development of pests/diseases and has a direct impact on plant cultivation efforts. One of the important insect pests in the land in Bandar Tarutung Village, Angkola Sangkunur District, South Tapanuli Regency is the walangsangit (*Leptocorisa oratorius* F, Coreidae, Hemiptera), where this pest almost attacks rice crops almost every season.

This pest attacks rice plants after the rice flowers. The rice grains are pierced with its rostrum, then the liquid of the grains is sucked due to the attack of this pest, the growth of rice grains is not perfect, the seeds/grains are not fully filled or are completely empty. Thus it can result in a decrease in the quality and quantity of the results.

CONCLUSION

The results of the research analysis that has been carried out conclude that : Based on the results of the research conducted, the largest population of walangsangit was trapped in the W6 treatment (yellow trap), namely a total of 23, therefore the best result among all treatments was W6 (yellow trap).

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