

# Design of Eco Friendly Mechanical Control Device to Trap Pests with Propeller

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**Abstract**—Various methods both physically and mechanically to control wereng coklat pest have been carried out. However, those ways are less effective control. Then another method was developed more practices and faster using chemical pesticide. However, pesticide has negative impacts. The misuse of pesticide can be danger to public. Therefore, it is necessary to develop eco friendly technology to control pests, based on Integrated Pest Management (IPM) concept considered by ecosystem, stability and continuity of production. Specific target of this research is to develop automatic device to control wereng coklat pest. The purpose of this research is to design wereng coklat pest control device with a motion sensor that consists of a mechanical vacuum and aluminum propeller. The mechanical vacuum linked to the pipe that tipped on light suction funnel. In the suction funnel installed motion sensors that serve to detect the presence / movement wereng coklat pests. Motion sensors will automatically activate a button on the base of the pipe, the light will be light up and suck up the wereng coklat. If there pests are closer to the light, the motion sensor will give a signal and the dynamo will turn the mechanic propeller automatically and suck the pest into the container box pests. This study is experiment research with developed by tested prototype both pre and post test. The result will be used for the evaluation and repair so device will increase capability for hold down pest population up to 75% without pesticide.

**Key word**— motion sensors, propeller, wereng coklat pest

## I. INTRODUCTION

*Wereng Coklat* (*Nilaparvata lugens* Stal) is one of the most dangerous pests for the rice plant [1]. These pests are very difficult to control because it has various advantages are adaptable and capable of forming a new biotype by transferring with great destructive force. This pest has the ability to maintain an excellent generation [2]. Even this pest has become a global pest (the very important global pest). In 2010, in addition to Indonesia, this pest also attacks rice plants in China, Vietnam, Thailand, India, Pakistan, Malaysia, Philippines, Japan and Korea.

This pests that are difficult to detect, but its existence is always threatened the stability of the national rice production [3]. In 2005 this pests attack concentrated in Java with attacking 56 832 hectares of rice plants [4]. Various methods both physically and mechanically to control *wereng coklat*

pest have been carried out. However, those ways are less effective control [5].

Then another method was developed more practices and faster using chemical pesticide. However, pesticide has negative impacts [6]. The misuse of pesticide can be danger to public [7]. Therefore, it is necessary to develop eco friendly technology to control pests, based on Integrated Pest Management (IPM) concept considered by ecosystem, stability and continuity of production.

## II. RESEARCH METHODS

This study is experiment research with developed by tested prototype both pre and post test. Testing prototype in two locations that have different characteristics, namely in the districts Genuk and Gunungpati Semarang. Appliance installed at four different points during the 30 days.

## III. FINDINGS AND DISCUSSION

In this research, pest control device functioned as an automatic machine. Prototype was designed with a mechanical concept that is environmentally friendly, it is to reduce the effects caused by the use of chemical pesticides. Arrest pest extermination mechanically is expected to reduce the pest population is up to 75% of the population.

The purpose of this research is to design *wereng coklat* pest control device with a motion sensor that consists of a mechanical vacuum and aluminum propeller. The mechanical vacuum linked to the pipe that tipped on light suction funnel. In the suction funnel installed motion sensors that serve to detect the presence / movement *wereng coklat* pests.

Based on the catch will be analyzed arrival time of pest populations and immigrants so that the recommended time or transplanting seedlings. Post test results used for the evaluation and improvement of the prototype. In the first experiment known that pests like lights installed on the prototype. Insects are caught are *wereng coklat* (*Nilaparvata lugens* Stal), *kepiding tanah* (*Scotinophara coarctata*), *penggerek batang padi* (*scirpophaga incertulas*) and *Coccinella*.

This study different from pest control devices available. This prototype does not use pesticides, but using light. Mechanical prototype developed by the propeller and the vacuum by 5 pieces of colored lights of red, green, yellow,

white and blue. the prototype is installed 4 motion sensors. Note Figure 1.



Fig. 1 *Wereng coklat* pest control device

The lights are connected to the pipeline at least 30 cm to the valve cover plate 1 mm thick. Motion sensor detects motion *wereng coklat* pest and will automatically turn on the 12 volt dynamo. The mechanical vacuum linked to the pipe that tipped on light suction funnel. In the suction funnel installed motion sensors that serve to detect the presence / movement *wereng coklat* pests. Motion sensors will automatically activate a button on the base of the pipe, the light will be light up and suck up the *wereng coklat*. If there pests are closer to the light, the motion sensor will give a signal and the dynamo will turn the mechanic propeller automatically and suck the pest into the container box pests.

#### IV. RESULT

The purpose of this research is to design *wereng coklat* pest control device with a motion sensor that consists of a mechanical vacuum and aluminum propeller. The result will be used for the evaluation and repair so device will increase capability for hold down pest population up to 75% without pesticide.

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