EFFECT OF BARRIER PLANT VARIATION AS NATURAL PEST CONTROL AGAINST THE PATTERN OF TWO-TROPHIC INTERACTION AND RICE CROP PRODUCTIVITY

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ABSTRACT

Natural Pest Control is done by ecological approach that optimizes ecosystem service work in controlling pest population. One is with a barrier plant that enables multitrophic interactions among the main crops, pests, natural enemies, and the different types of secondary crops that serve as the barrier plants. The aims of this research are to analyse: (1) effect of the barrier plant variation to the population dynamic and diversity of insect pests and their natural enemies on rice crop; (2) the two-trophic interaction pattern between insect pest and natural enemy on barrier and without barrier treatments; (3) effect of barrier plant variation to rice crop productivity; and (4) the most effective type of barrier plant plays role in natural pest control and increase the productivity of rice crop.

The research was conducted in the experimental Garden of Faculty of Agriculture of Gadjah Mada University, in Banguntapan, Bantul. The independent variable of this study is the treatment of barrier plant variation, i.e. control (without barrier), natural weed, sunflower and kenikir flower plants, while the dependent variables are diversity of arthropod, population dynamic of arthropod, interaction pattern of two-trophic of between pests and natural enemies and rice crop productivity. Arthropod observation (insect pests and their natural enemies) was carried out in the morning, which was between 08.00-11.00 am by scan sampling. Arthropod data retrieval was conducted every 3 weeks. The retrieval of crop productivity data was done when the harvest per treatment plot. The diversity of arthropod in each treatment was calculated by the Shannon-Wiener index formula. To see the two-trophic interaction pattern between insect pests and their natural enemies was analyzed with the program Bipartite in R Statistics. The Data obtained was then tested with ANOVA, to see the effect of the treatment of various types of barier plants on diversity and population dynamis of rice crop arthropod, as well as rice crop productivity. Once known there was a difference between treatment, then followed by a DMRT test to determine which treatment produced the best effect.

The conclusion of the study are: (1) There is no significant difference in the effect of barrier plant variation to the differences in population dynamic and diversity of insect pests and their natural enemies on rice plant among the treatment; (2) There is a difference in the two-trophic interaction pattern between insect pests and natural enemies at the barrier and without barrier treatments seen from the frequency of interaction between the two-trophic, but need to be conducted a further interraction pattern data analysis; (3) There is no significant difference in the effect of barrier plant variation to the productivity of rice crop, but it is necessary to conduct advanced research that is associated with other variables that affect rice crop productivity; and (4) the most effective type of barier plant role in natural pest control is the Kenikir flower, but it needs to conduct an advanced research related to the composition and layout of the plant as a barrier plant.

Kata Kunci: *barrier plants, pests, natural enemies*