

EFFICACY OF LIQUID SMOKE MADE FROM COCONUT SHELL AS BIOPESTICIDE TO CONTROL *Spodoptera litura* L. ON EDAMAME SOYBEAN PLANTS

Supervised by: Dr. Ir. Mochamad Syarief, M.P

Dedek Marviana

Program Study of Food Crops Production Technology
Department of Agricultural Production

ABSTRACT

One alternative in controlling *Spodoptera litura* L or armyworms in edamame soybean cultivation is to use biopesticide made from coconut shell liquid smoke. However, further tests regarding the efficacy of this type of liquid smoke need to be studied further. This study aims to compare the efficacy of coconut shell liquid smoke grade 3 compared to Deltamethrin on the intensity of *Spodoptera litura* L. attack on edamame plants. This study examined the components of compounds contained in coconut shell liquid smoke grade 3 and their toxicity to 3rd instar larvae of *Spodoptera litura* L. in edamame soybean cultivation. The research was carried out in the laboratories (Bioscience Laboratory and Plant Protection Laboratory of the Jember State Polytechnic) and the field (Dukumencek Village, Sukorambi District, Jember) and was divided into two stages which took place from July to September 2021. The first stage was testing the mortality of coconut shell liquid smoke grade 3 against *S. Litura* to determine the concentration of coconut shell liquid smoke which was later used in the field test by using Gas Chromatography-Mass Spectrophotometry (GCMS) type Shimadzu QP2010. The mortality test was carried out using a completely randomized design (CRD) with six levels of treatment concentration namely 0% (control), 5%, 10%, 15%, 20%, 25% with three repetitions each. The toxicity was calculated using Poloplus 1.0 software based on LC50 and LC95 values. The test then obtained a concentration of liquid smoke for field application of 15%. The second stage (field test) was comparing the concentration of 15% of coconut shell liquid smoke with Deltamethrin treatment. The field observation parameters included attack intensity

and wet weight of pods per plant sample. The normality and homogeneity of the field data were then tested using SPSS 15.0. The results showed that grade 3 coconut shell liquid smoke contained 31 compounds, where Tetradecanoic acid and 9-Octadecenoic acid (both were toxic to *Spodoptera litura* L), were the two highest compositions in it. The toxicity values of grade 3 coconut shell liquid smoke based on LC50 and LC95 were 5.8% and 23.8%, respectively. In general, the application of coconut shell liquid smoke grade 3 and Deltamethrin showed a significant difference. The intensity of *Spodoptera litura* L attack was higher (5%) on the application of coconut liquid smoke grade 3 compared to Deltamethrin treatment (4%). However, the two treatments (coconut shell liquid smoke concentration of 15% and Deltamethrin) did not show any significant difference in the wet weight of pods per plant.

Keywords: *coconut shell, liquid smoke, soybean, Spodoptera litura L,*