

IMPACT OF BIOPESTICIDES ON POD BORERS *HELICOVERPA ARMIGERA* AND *ADISURA ATKINSONI* OF *LABLAB PURPUREUS*

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Abstract: The investigation was carried out at the Agriculture Research Station, theni district during *kharif* season 2016. The evaluated biopesticides were Parthenium leaves extract +cow urine (5%), Custer oil (2%), Adathoda justice leaves extract (3%), and sequential spray of *HaNPV-Bt* -NSKE, *Bt*-NSKE-*HaNPV* and NSKE-*HaNPV-Bt*. and bio-digester liquid were supplied to organic plots. Sequential spray of insecticidal spray and recommended dose of were applied to inorganic plot. Pod borers *Helicoverpa armigera*, *Adisura atkinsoni* Moore emerged as serious pests during cropping period. Sequential spray of insecticides applied at 7, 20 and 30 DAG, respectively recorded less insect pests abundance. Among biopesticides, sequential application of NSKE-*HaNPV-Bt* was effective against insect pests. *HaNPV* was effective against *H. armigera* larvae, but ineffective to other pod borers. Parthenium plant + cow urine extract were ineffective in reducing the pod borer incidence.

Key Words: *Adisura atkinsoni*, biopesticides, *Helicoverpa armigera*.

1. INTRODUCTION:

The pod borer complex include *Helicoverpa armigera* (Hubner), *Adisura atkinsoni* (Moore), *Maruca vitrata* (Fabricius), *Exelastis atomosa* (Walshingham), *Spenarches caffer* (Zeller) and *Lampides boeticus* (Linnaeus). The damage inflicted by *H. armigera* is generally confined to flowers, seeds and pods. The gram pod borer, *Helicoverpa armigera* is the most serious pest among all pod borers in most of the chickpea growing areas of the country and on an average around 30 to 40 % pods were found to be damaged resulting in the yield loss of been. Sprays and soil application of pesticides are costly and cumbersome to adopt. So it is imperative to find out an ecofriendly and need based use of chemical pesticides as a component of integrated pest management (IPM). Chemical pesticides used for insect control may create residue problem in green pods. In this context, evaluation of botanical insecticide is essential to find out the effective, eco-friendly and economical product to develop integrated pest management strategy. So far Tamilnadu state is concerned, no systematic attempt has been made by any workers in the past to evaluate bio-efficacy of botanical insecticides against insect pests of Indian bean. Therefore, the present study was carried out to determine the effect of the foliar application of aqueous *Parthenium* + Cow Urine Extract (PCUE), *Adhadoda justice* leaves Extract (AJLE) and Castor oil (CO) on the larva population density of *Helicoverpa armigera* and *Adisura atkinsoni* on *lablab purpureus* under field conditions.

2. MATERIALS AND METHODS:

The field trials were conducted during December 2015 to March 2016 at T Sindalacheri, which is a village panchayat located in the Theni district of Tamil-Nadu state, India. The latitude 13.0938995 and longitude 80.292356 are the geo coordinate of the T Sindalacherry.

Parthenium + Cow Urine Extract (PCUE) (10%)

Fresh leaves of *Parthenium* (200g) were washed thoroughly with water. Later the leaves were chapped and ground by adding small quantity of water with the help of a grinder. The extract was filtered and mixed with same proportion of cow urine (500mL). The filtered solution was used for spray at 10 per cent concentration.

Adhadoda Justice Plant Extract (AJPE) (5%)

Two hundred grams of *Adhadoda Justice* were crushed into plant extract and then soaked overnight in little quantity of water. The soaked mixture was squeezed through the muslin cloth and the volume was made up to one liter so as to obtain 5 percent AJPE.

Castor oil (CO) (2%)

The fresh castor oil was collected from oil mill and used for foliar spray at two per cent concentration.

Estimation of Insect Pest Population

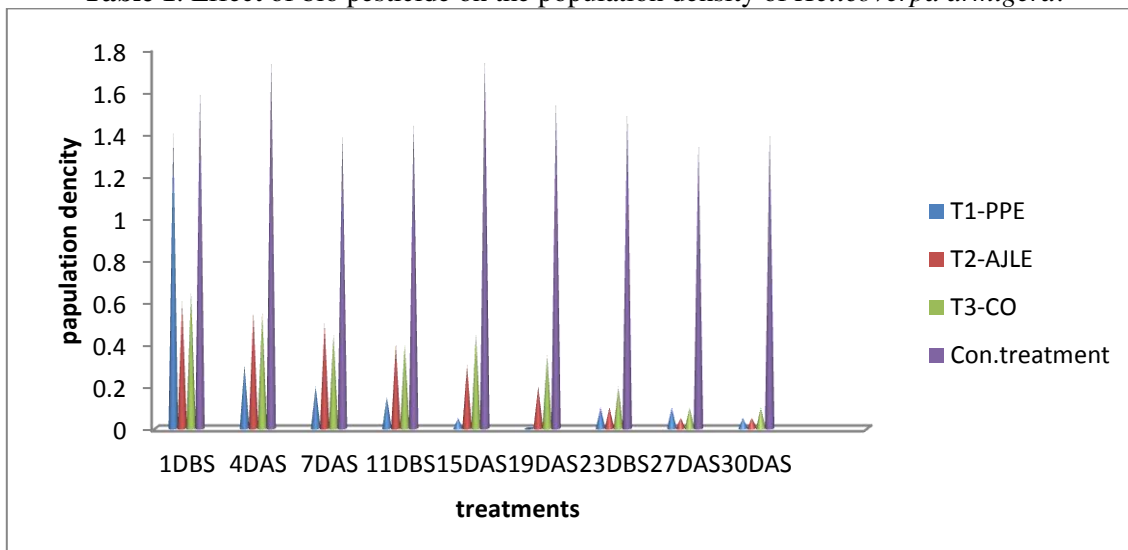
Calculation

Pod damage (%) = Number of damaged Pods/ Total No. of pods observed X 100

Seed damage (%) = Number of damaged Seeds/ Total number of seeds per pod X 100

3. RESULTS:

Table 1. Effect of bio pesticide on the population density of *Helicoverpa armigera*.



T1-PCUE- *Parthenium* + Cow Urine Extract (10%); T2-AJLE = *Adhadoda Justice* Plant Extract; T3-CO= Castor Oil; DBS- Day Before Spray; DAS- Days After Spray.

Figure 2 Effect of biopesticides on the population density of *Adisura atkinsoni*.

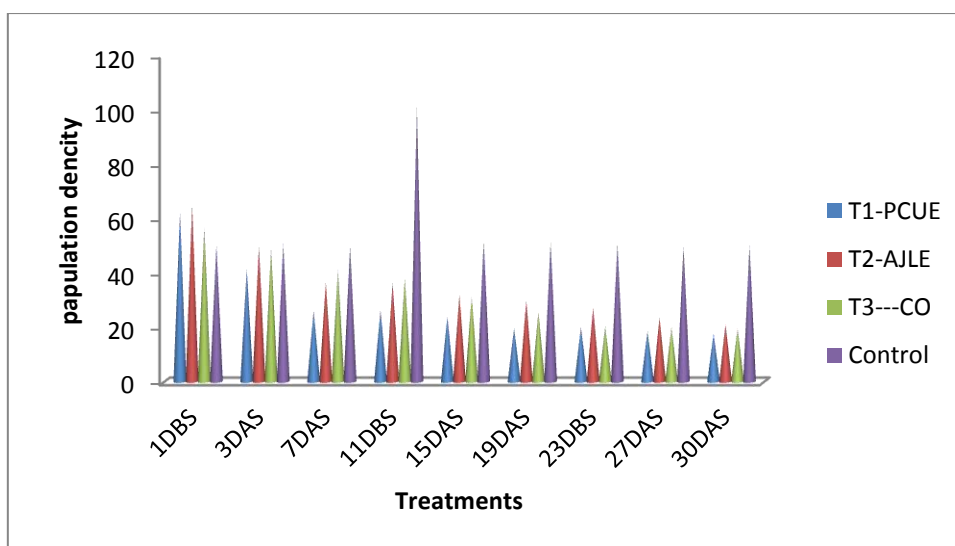


Table 3 Effects of biopesticides on Root Fresh and dry Weight of the *lablab purpureus* plants

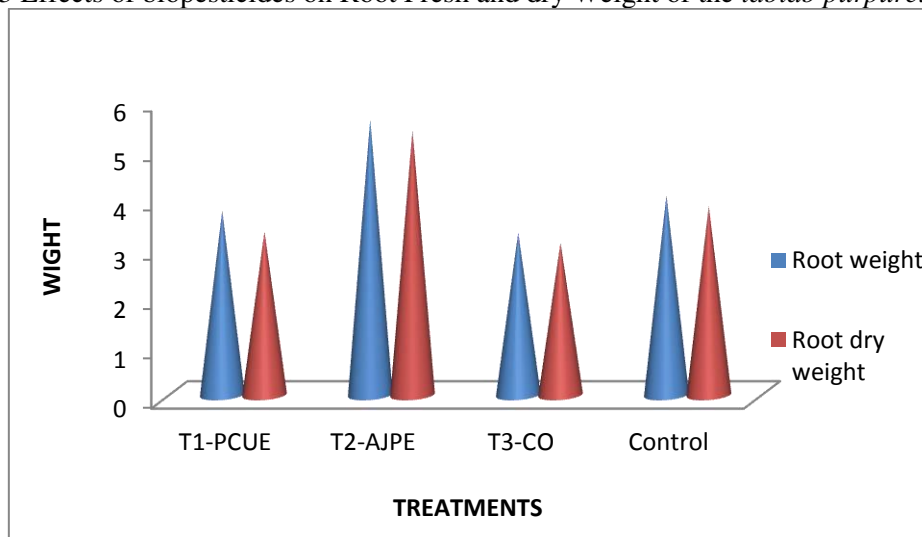
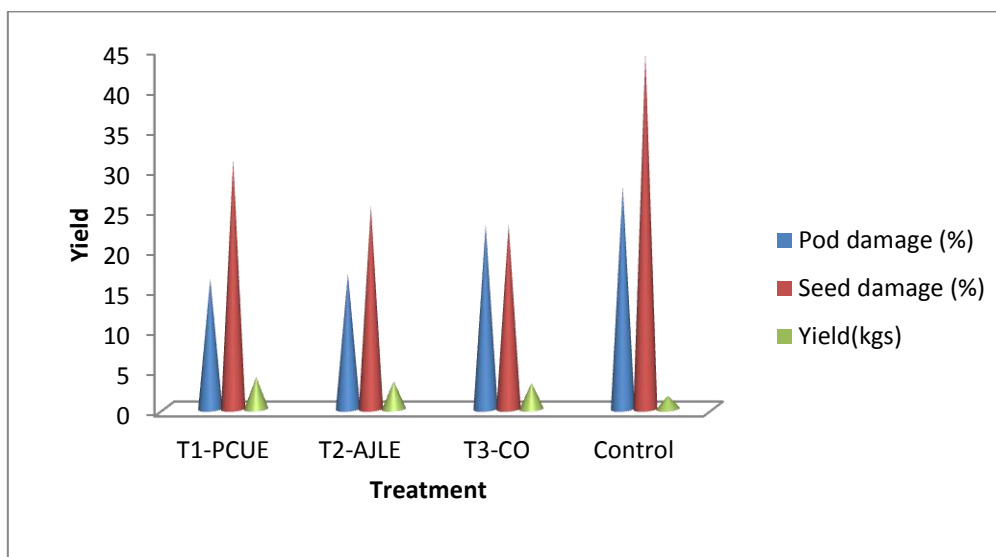


Table: 4 Effect of bio pesticides on crop yield, pod damage and seed damage of *lablab purpureus*.

4. DISCUSSION:

The study the effect of the foliar application of aqueous *Parthenium* + Cow Urine Extract (PCUE), *Adhadoda justice* leaves Extract (AJLE) and Castor oil (CO) on the larva population density of *Helicoverpa armigera* and *Adisura atkinsoni* on *lablab purpureus* under field conditions during the month of December to February 2016. Population density T1-PCUE, T2-AJLE also decreased the population density gradually from 0.6 to 0.05 which were effective result compared to T3-CO

Gradual decrease of *Adisura atkinsoni* larval population was registered among the treatments. Among the biopesticides sprayed plots, T3-CO decimated the population from 1140 ± 57.00 to 392 ± 19.6 followed by T2-AJLE which reduced the larval population from 65.00 to 21.05. Best suppression of *Adisura atkinsoni* was obtained by CO followed by AJLE and PCUE. *Lablab purpureus* plants have received *Adhadoda Justice* Plant Extract application and untreated control had better root weight and dry weight than plants with other biopesticide application. The highest pod damage, seed damage and lowest yield were recorded in control than the treated plants. T2-AJLE and T1-PCUE showed lowest pod damage and T3-CO showed 22.98% of pod and seed damage (Table -4 & Figure 4). Next to the control 31.08% and 25.30% seed damage were observed in T1-PCUE and T2-AJLE respectively.

Highest yield (4kgs/month) was recorded in the plants have received the application of T1-PCUE and yield (4kgs/month) was recorded in control. 3.3kgs and 3.5 kgs of yield were obtained in T3-CO and T2-AJLE respectively.

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