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SEASONAL INCIDENCE AND BIO-EFFICACY OF DIFFERENT INSECTICIDES AGAINST SUCKING PESTS OF SUMMER COWPEA (Vigna unguiculata L.)

ABSTRACT

Key words: Seasonal incidence, cowpea, bio-efficacy and residual toxicity

Experiments were conducted on “Seasonal incidence and bio-efficacy of different insecticides against sucking pests of summer cowpea (Vigna unguiculata L.)” at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh during summer 2016.

Study on seasonal incidence of jassid in cowpea revealed that the pest population initiated from the 1st WAS i.e the second week of March with 0.48 nymph/ 3 leaves/plant. Jassid population was observed to occur throughout the crop period. The population of the pest gradually increased from the 1st to 9th WAS and reached the peak population (4.91 nymphs/ 3 leaves/ plant) in the 9th WAS that is first week of May. Thereafter, jassid population decreased gradually and remained active throughout the crop period. The correlation matrix indicated that the population of jassids showed significant positive correlation with maximum temperature (r =0.689) and positive correlation with minimum temperature (r = 0.152), mean temperature (r = 0.564) and mean bright sunshine hours (r = 0.196). While, negative correlation with morning relative humidity (r = -0.511), evening relative humidity (r= -0.344), mean relative humidity (r = -0.424) and wind speed (r = -0.272).

The results revealed that whitefly population appeared from the 1st WAS i.e the second week of March and remained active throughout the crop period. The pest population increased gradually and reached to a peak level of 4.99 whiteflies/ 3 leaves/ plant during the 8th WAS that is fifth week of April. Later on, it was found to decline continuously and reached 1.54 whiteflies/ 3 leaves/ plant at the time of harvest. Correlation coefficient values stated that the population of whitefly exhibited significant positive correlation with maximum temperature (r =0.613) and positive correlation with minimum temperature (r= 0.265), mean temperature (r= 0.412) and mean bright sunshine hours (r= 0.303). Whereas, significant negative correlation with morning relative humidity (r = -0.769), evening relative humidity (r= -0.708), mean relative humidity (r = -0.753) and negative correlation with wind speed (r= -0.054).
The population cowpea aphid started from 1st WAS that is 2nd week of March with 0.48 aphid index / plant which gradually increased up to the 9th WAS that is fifth week of April with a peak level of 3.82 aphid index / plant, coinciding with peak stage of pod formation. The population declined continuously during successive weeks and reached 1.86 aphid index / plant at the time of harvest. The correlation studies indicated that the population of aphids exhibited significant positive correlation with maximum temperature \((r=0.632)\). While, positive non-significant correlation exhibited between pest population, sunshine hours \((r=0.292)\), mean temperature \((r=0.313)\), morning relative humidity \((r=0.019)\), evening relative humidity \((r=0.040)\) and mean relative humidity \((r=0.013)\). Whereas, correlation between aphids population, minimum temperature \((r=-0.336)\) and wind speed \((r=-0.500)\) was negatively non-significant.

Testing the bio-efficacy of insecticides, dinotefuran 0.006 per cent, acetamiprid 0.004 per cent and dimethoate 0.03 per cent successfully checked the incidence of jassids population. While in case of whitefly, the treatments of acetamiprid 0.004 per cent, dimethoate 0.03 per cent and spiromesifen 0.08 per cent effectively minimized the incidence of whitefly population. The application of dinotefuran 0.006 per cent, acetamiprid 0.004 per cent and dimethoate 0.03 per cent proved effective in recording minimum aphid population.

Considering the residual toxicity, it can be seen that acetamiprid 0.004 per cent, dinotefuran 0.006 per cent and dimethoate 0.03 per cent were comparatively more effective in controlling the adults of aphids than others insecticides under test, both in respect of mortality as well as their prolonged persistances. Taking the RPT values into consideration, they can be arranged in descending order as follows: Acetamiprid > Dinotefuran > Dimethoate > Clothianidin > Chlorfenapyr > Fonicamid > Cyantraniliprole > Spiromesifen > Spinosad.

Considering the yield and economics of insecticides, highest grain yield of cowpea 853 kg/ha was recorded from the treatment of dinetofuran 0.006 per cent which was statistically at par with acetamiprid 0.004 per cent (816 kg/ha), spiromesifen 0.08 per cent (795 kg/ha), dimethoate 0.03 per cent (790 kg/ha) and fonicamid 0.02 per cent (752 kg/ha). The economics of different insecticidal treatments revealed that application acetamiprid 0.004 per cent proved to be the most economically viable treatment with maximum CBR (1:21.8). While, dimethoate 0.03 per cent emerged as second treatment with CBR (1:21.2). The other treatments, spiromesifen 0.08 per cent (1:9.8), dinetofuran 0.006 per cent (1:9.4), chlorfenapyr 0.0075 per cent (1:5.8), clothianidin 0.003 per cent (1:5.5) and fonicamid 0.02 per cent (1:4.8) appeared next in order.