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Editors

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ombination with sect Pests of Rice

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hand is grown in 17 lakh wland in the State. Green and gall midge (*Orseolia* ich cause loss in yield of ed use of insecticides are f insecticides are coming g to be outdated and out icacy of newer molecules With these objectives, an University, Ranchi in wet 5x4 square meters. There made on 26th July, 2014. acephate 85SG @ 526 g/ of tank mix use with the es were tested. As such, fter transplanting (DAT). 15 DAT, followed by foliar the surfactant, *EK Boond* ated check and sole use ge, GLH and hispa were which was made on 25th

es viz. rynaxypyr20EC @ ith tank mix application nificantly more effective e application. Granular ays at 35, 55 and 95 DAT s, resulting in the higher ng with the instant tank gall midge and GLH and of the pest species with d rice crop.

ield

Estimation of Yield Losses due to *Helicoverpa armigera* (Hub.) in Tomato Crop in Hyper Arid Zone of Rajasthan

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The investigations on 'Eco-friendly Management of Tomato Fruit Borer, *Helicoverpa armigera* (Hub.)' were carried out at farm of Agricultural Research station, Swami Keshwanand Rajasthan Agricultural University, Bikaner during *rabi*, 2013-14. Tomato fruit borer, *H. armigera* (Hub.) is the most important insect pest infesting tomato fruits. This is a key pest as it attacks the cashable part of the plant *i.e.* fruits and makes them unfit for human consumption causing considerable crop loss leading up to 55 per cent (Selvanarayanan, 2000). It has been estimated that the crops worth Rs.1000 crore are lost annually by this pest (Jayraj *et al.*1994). Bio-efficacy of nine insecticides evaluated against fruit borer in tomato revealed that indoxacarb 14.5 SC treatment proved to be the most effective insecticides against *H. armigera.* In comparison to indoxacarb, minimum per cent avoidable losses (2.72%) were found in novaluron 10 EC followed by acephate 75 SP and chlorantraniliprole 18.5 SC in which 4.43 and 7.21 per cent avoidable losses, respectively were observed. The next and moderate effective insecticides were abamectin 5 SG, Spinosad 2.5 SC and quinalphos 25 EC with 10.58, 11.71 and 16.67 per cent avoidable yield losses, respectively. Maximum per cent avoidable losses (23.56%) were reported in *Bacillus thurigiensis* 8L followed (21.08 %) by HaNPV 250 LE/ha.

Key words: *H. armigera,* assessment of losses, bio-pesticides

Effect of Phosphorus Fertilization on Damage Potential of the Groundnut Bruchid

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Damage potential of the groundnut bruchid, *Caryedon serratus* (Oliver) was studied in laboratory on pods of eighteen genotypes of groundnut grown under two different levels of phosphorus *i.e.,* 50 kg/ha (normal P) and 100 kg/ha (high P). After harvesting, 100 gram pod sample of each genotype were kept in plastic container. In each container, six pairs of adult beetles (1:1) were released and whole set-up was replicated thrice. Observations were recorded on eggs laid, adult emergence, damage (%) and weight loss to pods and kernels. Under normal phosphorus level, the maximum (73.5) number of eggs were laid on pods of genotype SP 250 A, whereas under high phosphorus level the egg number was the maximum (197.0) on genotype TG 37 A. The adult emergence was the highest (50.5) in NRCG 10126 and the lowest (14.0) in TPG 41 under normal P level, however, under high P it was the highest (131.9) in TG 37 A and the lowest (51.0) in NRCG 10078. The bruchid under

normal P level caused the maximum damage to pods (63.1%) and kernels (68.9%) of genotype SP 250 A whereas under high P level, the highest damage was recorded in case of genotype TG 37 A (95.7 and 98.0%, respectively in pods and kernels). Similar trends were observed in case of weight loss caused by the beetle under normal P level. The studies clearly indicated that with the increase in phosphorus levels; the fecundity, adult emergence and damage increased. It is inferred that application of phosphorus should be limited to 50 kg/ha in order to minimize damage caused by the bruchid.

Key words: *Caryedon serratus*, groundnut bruchid, phosphorus fertilization, damage potential

Effect of Abiotic Factors on Population Dynamics of Insect Pest

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The term global change embraces a range of natural and anthropogenic environmental changes. According to Intergovernmental Panel on Climate Change, it is defined as "Change in climate over time, either due to natural variability or as a result of human activity". The most of the warming observed over the last 50 years is attributable to human activities. The global mean surface temperature is predicted to increase by 1.4 to 5.8°C from 1990 to 2100. If temperatures rise by about 2°C over the next 100 years, negative effects of global warming would begin to extend to most regions of the world.

Climate change poses a threat to the control of pest and disease invasions. These "pests and diseases" include insects, plant diseases and invasive weeds. Climate factors that aid in pest and disease invasions are mostly temperature related and include increasing average temperatures, warmer winter minimum temperatures, changes in precipitation patterns and water shortages. The occurrence of climate changes is evident from increase in global average temperature, changes in the rainfall pattern and extreme climatic events. These seasonal and long term changes would affect the fauna, flora and population dynamics of insect pests. The abiotic parameters are known to have direct impact on insect population dynamics through modulation of developmental rates, survival, fecundity, voltinism and dispersal. Among the climatic factors, temperature is an important factor. The studies showed declined survival rate of brown plant hopper *Nilaparvatha lugens* (Stal) and rice leaf folder, *Cnaphalocrocis medinalis* (Guen) at higher temperature, indicating that rising temperature could impact the changes in the pest population dynamics of rice ecosystem. The alteration in the voltinism also could be the results of warming and it is more beneficial to multivoltine species. Beside these, elevated CO_2 also has some impact on pest's population abundance; the crop grown under the elevated CO_2 could alter the nutritional value of plants, it may alter the insect abundance and increase the consumption rate of herbivores. Therefore, climate change would result in changes in the population dynamics of insect pests.

Key words: Climate change, insect pests, population dynamics