O-69

Bio-efficacy of fly ash based herbal insecticides against pulse beetle, Callosobruchus chinensis L. (Coleoptera: Bruchidae) infesting cowpea

K. C. Sharma and V. D. Mudgal
Post Harvest Technology Scheme, Department of Processing & Food Engineering,
College of Technology & Engineering, MPUAT, Udaipur 313 001, Rajasthan

An experiment was conducted on "Bio-efficacy of fly ash based herbal insecticides against pulse beetle, *Callosobruchus chinensis* L. (Coleoptera: Bruchidae) infesting cowpea" at Post Harvest Biological Laboratory, Post Harvest Technology Scheme, Department of processing and Food Engineering, College of Technology and Engineering, Udaipur. All the evaluated fly ash based herbal insecticides application were found effective against pulse beetle as compared to control. Among fly ash based herbal insecticides, fly ash + neem seed kernel powder @ 10g/kg seeds showed the maximum (97.33%) adult mortality after 72h time intervals. The minimum (60%) per cent mortality was observed in cowpea seeds treated with fly ash + curry leaf powder (9:1). The lowest number of eggs (0.30 eggs/seed) was recorded in grain treated with fly ash + neem seed kernel powder followed by fly ash + custard apple seed powder (0.40 eggs/seed). The minimum adults (1.00) emergence were recorded in seeds treated with fly ash + neem seed kernel powder followed by fly ash + custard apple seed powder (1.20). No damage sign (holes) were recorded in cowpea seeds treated with fly ash + neem seed kernel. The minimum weight loss (1.33 %) was recorded in fly ash + neem seed kernel powder. The fly ash + curry leaf powder (10g/kg seeds) was the least effective (8.50%) in protecting cowpea seeds from the damage of pulse beetle. Cowpea seeds treated with fly ash + neem seed kernel powder exhibited maximum (93.51%) inhibition in emergence of adults followed by fly ash + custard apple seed powder (92.21%) and fly ash + neem leaf powder (90.91%). The minimum of 64.94 per cent adult inhibitions were exhibited by fly ash alone at 10 g/kg seeds. No deleterious effect of fly ash based herbal has been observed on the germination of cowpea seeds at any dose level up to 120 days of treatment.

O-70

Biochemical basis of host suitability for groundnut Bruchid beetle

Poonam Jasrotia, M.V. Nataraja, G. Harish, M.K. Mahatama, Prasanna Holajjer, S.D. Savaliya and Meera Gajera
Directorate of Groundnut Research (DGR), P.B. No. 5, Junagadh 362 001, Gujarat

Biology of groundnut bruchid beetle Caryedonserratus (Oliver) was studied on five different hosts viz., tamarind (*Tamarindusindica* L.), latakaranja (*Caesalpinia crista* L.), groundnut (*Arachishypogaea* L.), cowpea (*Vignaunguiculata* L.) and golden shower (*Cassia fistula* L.) under laboratory conditions (mean temperature of 28°C and 85% relative humidity). The bruchid beetle was reared on seeds (100 g) of each plant host, and in each sample five adult pairs (1:1) were released. The entire experimental set-up was replicated thrice. The maximum numbers of eggs were laid on cowpea (23.33) seeds followed bylatakaranja (23.0) and golden shower. It was observed that the eggs laid on latakaranja do not hatch at all, while maximum number of larvae was emerged from eggs laid on cowpea (26.33) followed by groundnut (17.67). The bruchid completed its life cycle in shortest time on tamarind (49.33 days), however, life cycle was longest on cowpea (86.33 days). Total number of adult emerged

from each host were recorded and it was found that the adult emergence was highest in groundnut (147.33) followed by tamarind (79.33).Subsamples of seeds from each host were analysed for trypsin inhibitor activity and sugars. Significant differences were found in trypsin inhibition activity of hosts used, lowest being in groundnut (11.4%) and in tamarind (12.7%). Total sugars were found to be highest in latakaranjaand golden shower. It is inferred that there is a correlation of insect growth and multiplication with trypsin inhibitor activity and total sugars content found in tested hosts. The information can be used to explain the resistance mechanism of different plant hosts to bruchid beetle.

O-71

Influence of temperature and relative humidity on the development of pulse beetle, Callosobruchus chinensis (Linn.) on mungbean, Vigna radiata (Linn.) wilczek

R. S. Bajia and M.C. Bhargava
Department of Entomology, S.K.N. College of Agriculture, SKN Agriculture University, Jobner, Rajasthan

Developmental studies of C. chinensis were undertaken in the laboratory at four different temperatures and humidity levels on mungbean grains in order to observe their effects on ovipositional potential, ovipositional period, incubation period, developmental period, adult emergence, grain damage and weight loss of grain. The temperature levels of 20+1, 25+1, 30+1 and 35+1 and required humidity levels of 60, 70, 80 and 90 per cent were maintained by using digital environmental chamber. For the study of ovipositional potential, five pairs of freshly emerged beetles were released in glass vials for egg laying and oviposition period. The total number of eggs laid by the female was counted daily till death of females and oviposition periods were also recorded. A random sample of 40 seeds containing single eggs (40 eggs) was placed in separate tube for development. The specimen tubes were covered with pieces of muslin cloth and kept under each combination of temperature and relative humidity. The growth and development of C. chinensis was studied under stored conditions on different temperature (20, 25, 30 and 35 ^{0}C) and humidity (60, 70, 80 and 90%). The temperature and humidity have been shown to play a vital role in the growth and development of various stages of this pest. The ovipositional potential increased with the increase in temperature from 20^{0} to 30^{0} C and decreased at 35^{0} C. The ovipositional incubation and developmental periods decreased with the increase of temperature and vice-versa. The adult emergence, grain damage and loss in weight increased upto 30^{0}C and maximum at 30^{0}C and 70 per cent relative humidity and less at 20^{0}C and 90 per cent relative humidity. On the basis of various parameters, it can be concluded that for development of this pest, the optimum conditions were 30+1^{0}C temperature and 70+5 per cent relative humidity.

P-195

Carbon dioxide seed treatments against *Rhizopertha dominica* fab. infesting stored wheat seed

G.M. Bansode, U.K. Kadam, V.R. Shelar and M.B. Dhonde
Seed Technology Research Unit, M.P.K.V. Rahuri, 413 722 Maharashtra

Wheat is an important food crop of India, which ranks second after rice and serving as a staple food for millions of people. It accounts for an area of 29.90 million hectares with production of 93.90 million tones. The presence of insects in stored products has always posed unique problems. Nearly 10 per cent of the grain stored after each harvest is believed to be lost due to ravages of rats, insects, mites and microbial agents. Fumigation is the main