[2623] ONLINE DECISION SUPPORT SYSTEM FOR INTEGRATED CODLING MOTH MANAGEMENT

W. L Bajwa, M. Kogan & L. Coop, Integrated Plant Protection Center (IPPC), Oregon State University, Corvallis, OR 97331-8530, USA.

Successful management of Codling Moth (CM), *Cydia pomonella* L., a key pest of deciduous fruits, depends heavily on accurate and timely information. Internet offers new opportunities to accessing and disseminating current information quickly and inexpensively. It provides excellent interfaces for all kinds of interactive network databases, and many kinds of online analyses and data processing. The number of computers connected to the Internet has grown exponentially in the past few years and the potential exists to reach more people, and faster electronically than through hardcopy. An internet-based Codling Moth Information Support System (CMISS) has recently been developed to support IPM implementation for the Codling Moth. CMISS is a comprehensive source of biological and management information on the codling moth and represents the state-of-the-art for web applications and decision support systems. This site uses both static (text, graphics, and tabular) information and dynamic (database-driven and server-side applications) information. CMISS currently hosts various databases and knowledgebases on different aspects of codling moth biology, ecology, and integrated management. It also provides compilations on various aspects of codling moth phenology and population dynamics including modeling parameters, etc. Its bibliographic database provides access to an almost complete coverage (over 6,000 references) of worldwide codling moth literature from 1700 to 2000. This database is designed to allow convenient searches by author, year of publication, title, publication type (journal/book title), and keywords. A generalized degree-day calculator can be used from anywhere in the world for forecasting codling moth phenology under local conditions. The program works by allowing the client computer to upload a local weather data file to the server. An online population dynamics model allows users to determine the combined effects of multiple control measures such as mating disruption and reduced rate of chemical insecticides. CMISS is available at http://ippc.orst.edu/codlingmoth/.

Index terms: Phenology, population dynamics, IPM, Internet, knowledge-base

[2624] INTEGRATED CONTROL OF MEDITERRANEAN SNAILS IN SOUTHERN AUSTRALIA, INCLUDING THE USE OF PARASITIC SARCOPHAGID FLIES

G.H. Baker[1], D.C. Hopkins[2] & J.B. Coupland[3], [1]CSIRO Entomology, P.O. Box 1700, Canberra, A.C.T. 2601, Australia, E-mail geoffb@ento.csiro.au; [2]SARDI, Entomology, P.O. Box 397, Adelaide 5001, South Australia; [3]CSIRO Biological Control Unit, 34982 Montferrier sur Lez, France.

Three introduced species of white and conical snails, *Theba pisana* (Helicidae), *Cernuella virgata* and *Cochlicella acuta* (Hygromiidae), climb on to the heads, pods and stalks of cereals and legumes in late spring to aestivate in southern Australia. During harvest, the snails clog machinery and contaminate grain. Significant time is wasted by farmers when they have to clear snail blockages from their machinery. The contaminated grain is either unacceptable to grain handling authorities or is down-graded in quality. Farmers may also incur significant costs having rejected grain cleaned to remove snails, but this can be difficult to achieve, especially with small *C. acuta*. Shipments of grain have been rejected overseas because of snail presence in consignments. Snails pose a serious threat to the export marketing of Australian grains. *T. pisana*, *C. virgata* (to a lesser extent) and a fourth introduced species, *Cochlicella barbara*, also feed on legume-based pastures (e.g. annual medics, lucerne, clovers) and seedling crops (e.g. barley, oil seeds) causing severe damage. Large numbers of snails have invaded native ecosystems (e.g. woodlands). This paper will discuss recent developments in methods to control the snails, and some of the problems associated with them. Molluscicides can be effective but are expensive for broad acre use. Wind-rowing crops prior to harvest can help reduce contamination for some species (but not for *C. acuta*). Burning pasture and crop residues prior to sowing new crops and soil cultivation kill many snails, but these practices run counter to attempts to improve soil conservation. Surveys throughout the western Mediterranean have identified several potential biological control agents for use against the snails, particularly parasitic flies, *Sarcophaga* spp. (Sarcophagidae). Three of these agents, *S. uncicurva* and *S. balanina* which attack *T. pisana* and *C. virgata*, and *S. penicillata* which attacks *Cochlicella* spp., have been imported under quarantine to evaluate their host-specificity against native Australian snails (36 species, 11 families) and hence their suitability for release. *S. uncicurva* and *S. balanina* have proven to be unacceptable risks, but *S. penicillata* appears strongly host-specific. Permission to release it has been sought. In Europe, levels of parasitism of *C. acuta* by *S. penicillata* can be high (up to 90%). Levels of hyper-parasitism can also be high (up to 79% of *S. penicillata* parasitised by the pteromalid wasp *Novitzkyanus cryptogaster)*. In the absence of such hyper-parasites in Australia, *S. penicillata* may be more effective than in Europe.

[2625] SELECTIVE PESTICIDES AND WEEDY MARGINS: SYNERGISTIC EFFECTS OF INTEGRATED PEST MANAGEMENT

J.E. Banks[1] & J.D. Stark[2], [1]Univ. of Washington – Tacoma, 1900 Commerce St., Tacoma WA, 98402 USA E-mail: banksj@u.washington.edu; [2]Washington State Univ., Puyallup Research & Ext. Ctr., 7612 Pioneer Way E., Puyallup, WA 98371 USA.

We conducted a series of field and laboratory experiments designed to test the compatibility of the use of increased vegetation diversity with the use of a selective pesticide in controlling aphid pests in a crucifer agroecosystem. In a factorial design field experiment, we established plots of broccoli surrounded by (a) bare ground or (b) weedy margins; these plots were then sprayed with either (a) zero, (b) low, or (c) high levels of Imidacloprid. Analysis of aphid counts throughout an entire growing season revealed a synergistic effect of weedy margins and pesticide spray levels on pest densities. Furthermore, laboratory tests and a mathematical model suggest that field distributions of aphids may be determined by a combination of aphid response to vegetation patterning and natural enemy responses to selective pesticides.

Index terms: Brassica, Myzus persicae, Brevicore brassicae, vegetation diversity

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[2626] INTEGRATED MANAGEMENT OF THE APHID, APHIS GOSSYPII, IN INDIAN CHERRY TREE, IN IRRIGATED AREAS OF THE SÃO FRANCISCO VALLEY

F. R. Barbosa[1], K. M. M. Siqueira[2], E. A. de Souza[1], W. A. Moreira[1], F. N. P. Haji[1] & J. A. de Alencar[1], [1]Embrapa Semi-Árido, Caixa Postal 23, CEP 56300-970, Petrolina-PE, E-mail: flavia@cpatsa.embrapa.br; [2]UNEB. Dept. de Tecnologia e Ciências Sociais, CEP 48900-000, Juazeiro-BA.

The knowledge of indian cherry tree pests and beneficial insects at the São Francisco Valley are scarce. Sampling procedure was done in commercial orchards of Petrolina (Pernambuco State) from September 1998 through October 1999, and the aphid, *Aphis gossypii*, was found to be a key pest. Those insects were observed infesting leaves, new shoots and fruit peduncle, promoting mal formation, wilting, leaf dryness, fruit drop and yield reduction. Besides, there is a lowering in the photosynthetic capacity, due to sooty mould. Natural enemies observed were: *Cycloneda sanguinea*, Scymnus sp., spiders, chrysopa, sirphid flies and staphilinids. The weeds in the orchard were also sampled, and those tar arbor *Aphis gossypii* were: *Portulaca oleraceas* L., *Amaranthus spinosus* L., *Boechaavia coccinea* Mill, *Sida cordifolia* L. An experiment was done to control the aphid by alternative methods. A randomized block design with three treatments was used as follow: control, neutral detergent (160 ml / 20 liters of water), and wheat flour (1000 grams/ 20 liters of water). Five replicates were used, having the experimental unit 3 plants each. Treatment effect was evaluated after 3 and 7 days of spraying, by counting infested shoots with alive aphids. Treatment efficiency was obtained by using Abbott´s (1925) formula. The mean number of infested shoot in the control was 30.53, while in the wheat flour and detergent treatments, it was 15.5 (%E = 49.2) and 25.3 (%E = 17,1), respectively.

Index terms: *Malpighia* spp., natural enemies, alternative control