Abul-Nasr, S., 1959: Field tests on the use of polyhedrosis virus disease for the control of the cotton leafworm, *Prodenia litura* (F.). Bull. ent. Soc. Egypt **43**, 231–243.
Abul-Nasr, S.; Naguib, M. A., 1968: The population density of larvae and pupae of *Spodoptera littoralis* (Boisd.) in clover fields in Egypt. Bull. ent. Soc. Egypt **52**, 297–312.
El-Nagar, S.; Abul-Nasr, S., 1980: The susceptibility of the cotton leafworm, *Spodoptera littoralis* (Boisd.) to different isolates of nuclear polyhedrosis virus. Z. ang. Ent. **90**, 289–292.
Harrap, K. A.; Payne, C. C.; Roberson, R., 1977: The properties of three bauculoviruses from closely related hosts. J. Virology **79**, 14–31.
Jaques, R. P., 1971: Tests on protectants for foliar deposits of a polyhedrosis virus. J. Insect. Pathol. **17**, 9–16.
Klein, M.; Podler, H., 1978: Studies on the application of a nuclear polyhedrosis virus to control population of the Egyptian cotton worm, *Spodoptera littoralis*. J. Invert. Pathol. **32**, 244–248.
Moawad, G. M.; Topper, C. P.; El-Husseini, M. M.; Kamel, A. M., 1985: Seasonal abundance of parasites and predators of *Spodoptera littoralis* (Boisd.) in clover fields in Egypt. Agric. Res. Rev. Cairo **63**, 45–54.
Shorey, H. H.; Hale, R. L., 1965: Mass rearing of the larvae of nine Noctuid species on a simple artificial medium. J. Econ. Entomol. **58**, 522–524.

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Anz. Schädlingskde., Pflanzenschutz, Umweltschutz **65**, 54–57 (1992)

ISSN 0340–7330

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The influence of normal and low-rate application of insecticides on populations of the cotton whitefly and melon aphid and associated parasites and predators on cucumber

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Abstract

Studies were conducted in cucumber fields to evaluate the standard and reduced dosage rates of 5 insecticides for control the cotton whitefly *Bemisia tabaci* (Genn.) and melon aphid *Aphis gossypii* Glov. and effect of insecticide application on associated parasites and predators. Eggs of whitefly appeared to be less susceptibility to all treatments (max. 66 % reduction) than larval and pupal stages. Populations of larval and pupal stages of whitefly were significantly reduced in all treated plots. For example (larvae on day 10 after treatment with ethiofencarb, diafenthiuron, and chlorpyrifos methyl 67, 50, and 68 % pupae 68, 69, and 75 %). Two aphelinid parasitoids, *Eretmocerus mundus* Mercet and *Prospaltella lutea* Masi, were the most primary important parasitoids of the whitefly pupae in all test plots. Percent parasitism, in most treated plots, were slightly affected as a result of insecticide application. However, all tested insecticides and dosage rates caused severe suppression of emergence of adult parasitoids. Moreover, longevity of adult parasitoids were highly decreased.

Populations of the melon aphid were extremely reduced, especially by ethiofencarb and diafenthiuron. Populations of predator species (*Chrysopa carnea* Steph., *Coccinella undecimpunctata* Reiche and *Syrphus* spp.) were reduced in all treated plots. However, ethiofencarb applied at rates as low as 208.4 g a. i. / 100 l provided equally effective aphid control and conserved numbers of insect predators in the treated plots. Also, the prothiofos and chlorpyrifos methyl applications at rates as low as 166.7 g a. i. / 100 l kept aphid numbers below than those in control and caused a smaller reduction in the combined populations of insect predators.

1 Introduction

In Egypt, the cotton whitefly *Bemisia tabaci* (Genn.) and melon aphid *Aphis gossypii* Glover have recently become major pests in vegetable fields, and insecticides that suppress such insects and conserve natural enemies have an advantage over materials that do not. Control of the whitefly *Trialeurodes vaporariorum* (Westw.), on greenhouse ornamental and vegetable plants is often difficult, because asynchronous populations occur and various life stages (e. g., eggs and pupae) are resistant to insecticides (Webb et al., 1974). To date, whitefly control studies have dealt with gross impact on populations, emphasizing the immediate toxicity of chemicals; delayed and subtile effects have been ignored (Collmann and All, 1982). The results reported by Collmann and All (1982) indicated that the organophosphorus compounds, malathion and sulprofos, and the two formulations of resmethrin were intermediate in toxicity on greenhouse whitefly stages; these compounds were toxic to adults, but observations indicated that egg and pupal stages were not highly affected. However, very few studies have dealt with the adverse effects of insecticide applications on the abundance of natural enemies especially parasitoids of the whitefly in the fields treated with different chemicals. In view of the aphid control, McClanahan and Founk (1983) indicated that the control of aphids in vegetables has become more difficult in recent years; resistance to some insecticides has developed, and the control of other vegetable pests with broad-spectrum insecticides has depleted the aphid parasite and predator complex. There have been several studies of the toxicity of different insecticides to aphidophagous insects (Ahmed, 1955; Bartlett, 1958, 1963, 1966; Stern and van den Bosch, 1959; Markkula et al., 1979; Warner, 1981; Warner and Croft, 1982). Morrison et al. (1983) reported that insecticide treatments could be applied by air at less than the manu-

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facturer's recommended rates when beneficial insects are becoming sufficiently abundant to reduce the surviving aphid population.

Our objective was to evaluate the standard and reduced dosage rates of different insecticides for control of the cotton whitefly and melon aphid on cucumber, and effect of insecticide application on associated parasitoids and predators.

2 Material and Methods

Small plot-tests were conducted in cucumber fields at Minufiya, Shebin El-Kom in September 1991. "Alpha" cucumbers were planted August 9 in plots 4 rows, 6.5 m long × 1 m wide, with 35 cm between plants, and the plots were arranged in randomized blocks with three replications for each treatment. Cucumber plants of which 90–100 % were infested with both aphid *A. gossypii* and whitefly *B. tabaci* were selected for spraying with diluted solutions of selected insecticides.

Formulated products of 5 insecticides commonly used for the control of a large variety of insects on many agricultural crops in Egypt were tested in this study. These insecticides and dosage rates applied were as follows: prothiofos ("Tokuthion" 50 % EC, Bayer AG, Germany) at 166.7, 250, and 375 g a. i. / 100 l; chlorpyrifos methyl ("Reldan" 50 % EC, Dow Chemical Co., USA) at 166.7, 250, and 375 g a. i. / 100 l; acephate ("Orthene" 75 % SP, Chevron Chemical Co., USA) at 100, 150, and 225 g a. i. / 100 l; ethiofencarb ("Croneton" 50 % EC, Bayer AG, Germany) at 208.4, 312.5, and 468.8 g a. i. / 100 l; diafenthiuron ("CGA-106630" 50 % SC, Ciba-Geigy AG, Switzerland) at 100, 150, and 225 g a. i. / 100 l. Rates chosen covered the manufacturer's maximum and minimum recommendations. A single foliar spray of each insecticide treatment was applied on 6 Sept. with a knapsack with an adjustable cone nozzle calibrated to deliver ca. 500 l/ha of the diluted spray.

Pre- and post-treatment whitefly *B. tabaci* and aphid *A. gossypii* populations were counted at 24 h before and 2, 5, 10, and 15 days following insecticide application in both treated plots and untreated controls. A leaf-by-leaf count of ten leaves chosen at random from each replicate was adjusted by Henderson and Tilton's (1955) formula, for natural changes in population density occurring in the untreated check. Beneficial insects including the most common predators of aphids, i. e. *Chrysopa carnea* Steph., *Coccinella undecimpunctata* Reiche, and *Syrphus* spp., were also counted on each of the days following treatment.

Percent parasitism for the most important primary parasitoids of the whitefly, i. e. *Eretmocerus mundus* Mercet and *Prospaltella lutea* Masi, was determined in samples of whitefly pupae collected from both sprayed and unsprayed treatments. Samples of ca. 30 leaves were chosen, in 3 replications, at random from each treatment plot on each of days 2, 5, 10, and 15 following application. Emergence of the adult parasitoids selected was determined by collecting leaves that infested by an adequate number of parasitized pupae of whitefly were cut into pieces that could be placed in 10.5 × 1.8 cm petri dishes lined with filter papers. Four dishes (replications) were evaluated for each treatment with ca. 30–50 parasitized pupae per dish. The average number of emerged parasitoid adults was recorded on each of the days following treatments. To estimate longevity of adult parasitoids, ten new emerged adults of each parasitoid species were placed in 10.5 cm petri dishes with food (honey); three dishes were covered and left in the laboratory at a room temperature of 27 ± 2 °C, 50–60 % RH, and under a 12 h (12 h light) dark photoperiod. The longevity was recorded at each date. The same procedure was also followed for the control.

For all experiments in this study, data were subjected to analysis of variance, and treatment means were separated by Duncan's (1955) multiple range test.

3 Results and discussion

The detailed results (tables) will be sent on request.

3.1 Whitefly control

The whitefly *B. tabaci* was the most numerous pest found on cucumber during the study. The number of eggs found in the test plots, including untreated check, pre-treatment ranged from 432 to 777 per 10 leaves. By day 2 after treatment, all insecticide treatments slightly reduced the number of eggs than that of check, which did not exceed 45 % reduction in plots received 375 g a. i. / 100 l of chlorpyrifos methyl. In subsequent samples, the occurrence of egg populations were significantly reduced by 52 % in those plots received acephate (150 g a. i. / 100 l) and diafenthiuron (225 g a. i. / 100 l). Populations of *B. tabaci* larvae in the most treated plots were significantly reduced by the selected insecticides and dosage rates used. It is obvious that larvae were more susceptible to all insecticides used than eggs. Diafenthiuron and ethiofencarb applied at either recommended or sub-recommended dosage rates provided continuing control through 15 days after treatment. For example, on day 5 after treatment, the level of *B. tabaci* larvae in plots received dosage rates as low as the recommendations of each ethiofencarb, diafenthiuron, and chlorpyrifos methyl would indicate about 70, 66, and 64 % control, respectively. In subsequent samples, by day 15 after treatment, satisfactory reductions (65–78 %) in larvae populations were obtained in all treated plots received dosage rates within the recommendations. These results indicate that continuing control obtained for larvae through 15 days after treatment probably due to: 1. the strong effects of insecticide residues on the early larval instars; 2. and increased numbers of parasitoids which attacked from adjacent untreated field plots. The results also demonstrate that pupae populations in all treated plots were significantly reduced than those in untreated check. For example, by day 2 after treatment, the number of pupae found in plots received dosage rates as low as the recommendations of diafenthiuron, prothiofos, and chlorpyrifos methyl never exceeded 120 per 10 leaves comared to 502 per 10 leaves in check. Pupae populations continued to be suppressed in most treated plots through day 15 after treatment, where satisfactory control averaged 52–73 % was obtained when plots received dosage rates within the recommendations.

3.2 Parasitism of the whitefly

As to the percent parasitism, emergence, and longevity of parasitoid *Eretmocerus mundus* that collected from parasitized pupae of whitefly from both sprayed and unsprayed treatments the results were as followed. By day 2 after treatment, the percent parasitism of whitefly pupae found in most treated plots was slightly varied but did not significantly differ than that in untreated plots. Percent parasitism found in check on that day averaged 13.1 %. However, the percent emergence of parasitoid adults from whitefly pupae collected from all treated plots greatly reduced, where did not exceed 15.6 %, in comparison with that of check averaging 98 %. In subsequent samples, especially by the last week of treatment, all test plots including untreated check had lower percent parasitism where did not exceed 8.1%. However, percent parasitism of the whitefly pupae collected from plots received the higher dosage rates of all selected insecticides was noticeable reduced than that of check. Emergence of parasitoid adults from whitefly pupae that collected after 5 days of insecticide application was still greatly reduced in most treated plots than that in check. For example, by day 15 after treatment, no parasitoid adults were emerged from whitefly pupae collected from all plots received the higher dosage rates of test insecticides. However, in such samples collected during the last week of treatment, emergence percentages of adult parasitoids increased, especially for those samples collected from plots received dosage rates within the recommendations of acephate, prothiofos and chlorpyrifos methyl, but still less than that of untreated check. The results indicated also that longevity of parasitoid *E. mundus* adults emerged from the whitefly pupae collected from all treated plots were highly decreased than that of control. Adult longevity of emerged parasitoids averaged 9.7 days in untreated samples; whereas, in general, did not exceed 1.6 days in those collected from treated plots.

Similar results were observed for percent parasitism, emergence, and longevity of parasitoid *Prospaltella lutea* adults determined in samples collected from both sprayed and unsprayed treatments. These results demonstrated the strong effects of insecticide residues on the two tested parasitoids through 15 days of application.

These small-plot tests indicated, generally, that moderate levels of whitefly control, especially for larval and pupal populations were seen in those plots received dosage rates within the recommendations of ethiofencarb, diafenthiuron, and chlorpyrifos methyl. However, all tested insecticides caused severe suppression of emergence of adult parasitoids, *E. mundus* and *P. lutea*, from the whitefly pupae, especially those collected during the first week after treatment. In addition, longevity of adult parasitoids were highly decreased as a result of insecticide application in all treated plots than that of control. The results given by COLLMANN and ALL (1982) indicated that the organophosphorous compounds, malathion and sulprofos, and the two formulations of resmethrin were intermediate in their toxicity to whitefly *Trialeurodes vaporariorum*. These compounds were toxic to adults, but observations indicated that egg and pupal stages were not highly affected. Thus, frequent applications would be necessary with most toxicants to insure whitefly-free plants (COLLMANN and ALL, 1982). Therefore, the selected insecticides in our study, especially ethiofencarb, diafenthiuron, and chlorpyrifos methyl could be applied at less than the manufacturer's recommended rates when beneficial insects are becoming sufficiently abundant to reduce the surviving whitefly population and to keep as many beneficial insects in sprayed plots as in unsprayed check plots.

3.3 *Cotton aphid control*

The cotton aphid *A. gossypii* was one of the main pests found in cucumber during the study, reaching populations with an average of 569—868 per 10 leaves in the test plots, including untreated check, 24 h pre-treatment. By day 2 after treatment, numbers of aphids in all treatments were significantly reduced. The best control of *A. gossypii* was obtained in the ethiofencarb, diafenthiuron, and chlorpyrifos methyl treatments. It provided an estimated 90% control of aphid populations at all selected dosage rates. In subsequent samples, the occurrence of aphid populations in those treatments was still greatly reduced until day 15 after treatment compared to the check and other chemical treatments. No populations of *A. gossypii* nymphs were found in the ethiofencarb and diafenthiuron treatments by day 5 after treatments. Nymph and adult populations, however, continued to be found in the prothiofos and chlorpyrifos methyl treatments but remained below than those in the check.

3.4 *Insect predators*

The main insect predators found in the test plots included *Chrysopa carnea*, *Coccinella undecimpunctata*, and *Syrphus* spp. Predator populations were significantly higher in untreated plots compared to treated plots, as a result of the absence of insecticide exposure and possible because of greater prey (aphid) densities. These results showed that ethiofencarb applied at rates as low as 208.4 g a. i. / 100 l could provide an effective aphid control, and conserved numbers of insect predators in the treated plots. The prothiofos and chlorpyrifos methyl treatments applied at the lowest rate used, 166.7 g a. i. / 100 l, caused a smaller reduction in the combined populations of predators than those of check, probably due to a higher number of aphid in those treatments.

In general, the carbamate ethiofencarb applied at rates as low as 208.4 g a. i. / 100 l suppressed melon aphid and could conserve its predators. The prothiofos and chlorpyrifos methyl applications at rates as low as 166.7 g a. i. / 100 l kept also aphid numbers below than those in the control and conserved numbers of insect predators, but aphid control did not appear to last as long as in plots sprayed with the lower rates of ethiofencarb and diafenthiuron. In agreement to date reported by MORRISON et al. (1983) and SMITH et al. (1985) ethiofencarb, prothiofos, and chlorpyrifos methyl, therefore, could be applied at less than the manufacturer's recommended rates when beneficial insects are becoming sufficiently abundant to reduce the surviving aphid population and only short-term control is needed.

Zusammenfassung

Über den Einfluß normal und niedrig dosierter Insektizide auf die Populationen der Baumwoll-Mottenschildlaus und der Melonenblattlaus und einige ihrer parasitischen und räuberischen Feinde an Gurkenpflanzen

Untersuchungen an Gurkenpflanzen sollten die Wirkungen von 5 gebräuchlichen Insektiziden in normaler und reduzierter Dosis auf die Mottenschildlaus *Bemisia tabaci* (Genn.) und die Blattlaus *Aphis gossypii* Glov. sowie auf deren wichtigste parasitische und episitische Feinde klären. Die Eier von *B. tabaci* erwiesen sich als weniger empfindlich (max. 66% Reduktion) als die Larven und Puppen. So waren z. B. unter dem Einfluß von Äthiofencarb, Diafenthiuron und Chlorpyrifosmethyl 10 Tage nach Applikation die Larven um 67, 50 und 68% sowie die Puppen um 68, 69 und 75% gegenüber Kontrolle reduziert. Zwei parasitische Feinde der Puppen, die Apheliniden *Eretmocerus mundus* Merc. und *Prospaltellus lutea* Masi, wurden durch

die Insektizide in ihrem Parasitierungs-Prozent kaum, jedoch in ihrer Schlüpfquote und Lebensdauer erheblich beeinträchtigt.

Die Populationen der Blattlaus *Aphis gossypii* wurden in allen Fällen, besonders aber durch Äthiofencarb und Diafenthiuron reduziert. Die Dichte der räuberischen Blattlausfeinde (*Chrysopa carnea* Steph., *Coccinella undecimpunctata* Reiche und *Syrphus* spp.) sank nach allen insektiziden Behandlungen. Doch blieb nach Äthiofencarb-Applikation, bei guter Wirkung gegen die Blattläuse, ein erheblicher Teil der Raubinsekten am Leben. Auch bei den Behandlungen mit *Prothiofos* und *Chlorpyrifos-methyl* in Dosen von 166,7 g / 100 l, durch welche die Blattläuse erheblich reduziert wurden, blieben wesentliche Teile der Raubinsekten-Populationen verschont.

References

AHMED, M. K., 1955: Comparative effect of Systox and Shradan on some predators of aphids in Egypt. J. econ. Entomol. **18**, 530–32.

BARTLETT, B. R., 1958: Laboratory studies on selective aphicides favoring natural enemies of the spotted alfalfa aphid. J. econ. Entomol. **51**, 374–78.

BARTLETT, B. R., 1963: The control toxicity of some pesticide residues to hymenopterous parasites and coccinellid predators. J. econ. Entomol. **56**, 694–98.

BARTLETT, B. R., 1966: Toxicity and acceptance of some pesticides fed to parasitic Hymenoptera and predatory coccinellids. J. econ. Entomol. **59**, 1142–49.

COLLMANN, G. L.; ALL, J. N., 1982: Biological impact of contact insecticides and insect growth regulators on isolated stages of the greenhouse whitefly (Homoptera: Aleyrodidae). J. econ. Entomol. **75**, 863–67.

DUNCAN, D. B., 1955: Multiple range and multiple F tests. Biometrics **11**, 1–42.

HENDERSON, D. F.; TILTON, E. W., 1955: Tests with acaricides against the brown wheat mite. J. econ. Entomol. **48**, 157–61.

MARKKULA, M.; RIMPILAINEN, M.; TIITTANEN, K., 1979: Harmfulness of soil treatment with some fungicides and insecticides to the biological agent *Aphidoletes aphidimyza* (Rond.) (Diptera: Cecidomyiidae). Ann. agric. Fenn. **18**, 168–70.

MCCLANAHAN, R. J.; FOUNK, J., 1983: Toxicity of insecticides to the green peach aphid (Homoptera: Aphididae) in laboratory and field tests, 1971–1982. J. econ. Entomol. **76**, 899–905.

MORRISON, W. P.; HOELSCHER, C. W.; TEETS, G. L., 1983: Insect and mite pests of Texas sorghum management approaches. Texas Agric. Ext. Serv. B 1220.

STERN, V. M.; VAN DEN BOSCH, R., 1959: The integration of chemical and biological control of the spotted alfalfa aphid. Part II. Field experiments on the effects of insecticides. Hilgardia **29**, 103–30.

WARNER, L. A., 1981: Toxicities of azinphosmethyl and other apple orchard pesticides to the aphid predator, *Aphidoletes aphidimyza* (Rondani) (Diptera: Cecidomyiidae). M. S. thesis, Michigan State University, E. Lansing, 75 pp.

WARNER, L. A., CROFT, A., 1982: Toxicities of azinphosmethyl and selected orchard pesticides to an aphid predator, *Aphidoletes aphidimyza*. J. econ. Entomol. **75**, 410–15.

WEBB, R. E., SMITH, F. F., BOSWELL, A. L.; FIELDS, E. S.; WATERS, R. M., 1974: Insecticidal control of the greenhouse ornamental and vegetable plants. J. econ. Entomol. **67**, 114–18.

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Anz. Schädlingskde., Pflanzenschutz, Umweltschutz **65**, 57–60 (1992)

ISSN 0340–7330

Rundschau

Forstinstitute in Eberswalde gegründet

Die Bundesforschungsanstalt für Forst- und Holzwirtschaft hat am 2. 2. 1992 in Eberswalde zwei neue Institute gegründet: das Institut für Forstökologie und Walderfassung sowie das Institut für Forstpflanzenzüchtung Waldsieversdorf. Beide Einrichtungen sind aus dem Institut für Forstwissenschaften hervorgegangen. Dort sollen 64 Mitarbeiter, darunter 21 Wissenschaftler, beschäftigt werden.

Schwerpunkt der Forschungstätigkeit in beiden Einrichtungen soll die Schaffung von wissenschaftlichen Grundlagen und Entscheidungshilfen in Waldökologie und Pflanzenzucht sein. Unter anderem sollen die wirtschaftlichen Auswirkungen von Waldschäden erforscht werden. In diesem Jahr sollen in der Kreisstadt Eberswalde noch eine gemeinsame forstliche Forschungsanstalt der Länder Sachsen-Anhalt, Brandenburg und Mecklenburg-Vorpommern sowie eine Fachhochschule entstehen.

Schweiz: Waldzustand 1991

Die Waldschäden in der Schweiz haben 1991 zugenommen. 68 Prozent aller Bäume, das sind sieben Prozent mehr als im Vorjahr, weisen über zehn Prozent Nadel-/Blattverluste (Schadstufen 1 bis 4) auf. Laut *Sanasilva-Waldschadensbericht 1991* sind 19 Prozent aller Bäume in die Schadstufen 2 bis 4 einzuordnen, das heißt, sie haben mehr als 25 Prozent Nadel-/Blattverluste. Im Vorjahr betrug der Anteil der Bäume in diesen Schadklassen 17 Prozent. Grund für die Verschlechterung des Waldzustandes sind die zunehmenden Kronenverlichtungen bei Tanne, Föhre und Eiche. Bei Fichte und Buche haben sich die Schäden dagegen kaum verändert.

AID-Informationen, Pressedienst, Jg. 40, Nr. 26, 1991

Gemeinsame Presseerklärung der Unterzeichner des „Übereinkommens zum Schutz der Alpen (Alpenkonvention)"

Die Umweltminister der Alpenstaaten Deutschland, Frankreich, Italien, Liechtenstein, Schweiz und Österreich sowie der Umweltkommissar der Europäischen Wirtschaftsgemeinschaft haben am 7. 11. 1991 das „Übereinkommen zum Schutz der Alpen (Alpenkonvention)" unterzeichnet. Dies ist das Ergebnis der 2. Internationalen Alpenkonferenz vom 6. und 7. November 1991 in Salzburg, an der auch Slowenien als Beobachter teilgenommen hat. Durch dieses Übereinkommen wird erstmals eine ökologisch orientierte umfassende Entwicklungsstrategie für den gesamten Alpenraum völkerrechtlich verbindlich festgelegt. Mit der „Alpenkonvention" ist ein entscheidender Grundstein für einen umfassenden Schutz unserer alpinen Umwelt gelegt.

BMU, Pressemitteilung 80/1991

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