

PROBLEMS IN PEST MANAGEMENT IN ISRAEL by
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The use of synthetic insecticides was readily adopted by Israeli agriculture in the late forties. It spread to large areas and was applied to many crops with great success. Thus, the Cereal Leaf Miner Syringopais temperatella Lederer was successfully controlled for the first time by the application of BHC which penetrated the leaf tissue and reached the larvae in their tunnels, which other insecticides could not (6).

Methoxychlor controlled the Mediterranean Fruit Fly Ceratitis capi- tata Wiedeman, and peach and apricot crops free of infestation were obtained. Premature drop of Valencia oranges due to C. capitata infestation was avoided, and marketable yields increased.

Control of the spiny boll-worm Earias insulana sprays enabled the introduction of cotton growing, and Boisduval with endrin with top yields (6). These are only a few outstanding examples of the early success with synthetic insecticides obtained in Israeli agriculture.

In the early fifties it looked as if the introduction of the synthetic insecticides would solve all pest problems. But misgivings about the use of insecticides were already cast at that time. It soon became apparent that pesticide residues deteriorated at higher rates under Israeli climatic conditions. When a single application of insecticide failed it resulted in higher dosages and frequent applications.

It did not take long for the undesirable effects of the wide spectrum of insecticides to manifest themselves.

Infestations of the Florida red scale, Chr.ysomphalus aonidum Lin- naeus and the Fluted scale Icerya purchasi Maskell broke out in citrus groves sprayed against capitata, whereas adjacent orchards, and even plots in the same orchard, whTch were not sprayed, remained clean of infestation, as predators and parasites were spared (1). A similar situation appeared with the rust mite Phyllocoptruta oleivora Ashmead, which could not be control led by several applications of sulphur as it destroyed predaceous mites as well.

Only the introduction of selective acaricides improved the situation (10).

The part of predaceous insects in keeping populations of insect pests in citrus groves under control was underestimated when they were present (2, 3, 4, 9). They could fully be appreciated only when they disappeared as a result of the introduction of synthetic insecticides into the citrus grove.

The increase of areas under irrigation in Israel, in particular the cotton area, caused Spodoptera littoralis Boisduval to become a pest of primary importance in cotton and increased the number in pesticide application to cotton. As cotton was treated by aircraft, a new problem was created, namely the drift from cotton fields to adjacent orchards. This caused heavy mortality of parasites and an upsurge of various soft scales was observed (11).

Israeli farmers who welcomed the introduction of synthetic insecticides adopted the practice of preventive spray applications, a practice not always justifiable. The ill effects of this practice became apparent to local entomologists and they tried to uproot these well established practices (5). It was not easy to persuade farmers to turn to insecticide application only when absolutely necessary, and when doing so to use selective insecticides which would spare predators and parasites as much as possible.

The citrus industry was the first to adopt rational methods of pest control. The cover sprays with methoxychlor against C. capitata were substituted with bait sprays, a method yielding results only when applied totally without omitting individual groves. The Citrus Marketing Board organised a compulsory treatment, as a result of which a favourable biological balance in the grove was restored and maintained, and the fruit shipped was free of C. capitata maggots (7).

Efforts made to introduce parasites of C. capitata were unsuccessful, as were also the early trials with the sterile male technique (8).

In field crops too, efforts were and are being made to introduce integrated control measures. In the cotton fields a threshold of infestation was established for each major pest, and the number of spray applications was reduced by half.

In ground-nuts it was found that the S. littoralis larvae feeding on foliage did not always affect the crop. The establishment of a threshold of infestation reduced the number of pesticide applications from nine to two or none at all (12).

With all above mentioned successes the situation in Pest Management in Israel is not yet what we would want it to be. Work on the various phases of integrated control is going on at the Volcani Institute, the Faculty of Agriculture, the Tel-Aviv University and the Biological Control Institute of the Citrus Marketing Board.

Parasites and predators are being introduced and examined. Various methods involving food baits and sex attractants are tried out, and ecological factors are studied so they could be manipulated to adversely affect populations of insect pests (13).

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