

INTRODUCTION TO THE INTEGRATED PEST MANAGEMENT GUIDELINES

IPM within Integrated Fruit Production

Integrated Fruit Production (IFP), sometimes referred to as Integrated Production or Integrated Crop Management Systems, entails the integration of all good agricultural practices in such a way that economic returns are maximised with simultaneous regard for sustainability and a minimisation of environmental impact. This concept encompasses all production aspects from identifying appropriate cultivars for particular areas, through soil preparation and the utilisation of certified disease and pest free planting material which is true to type to horticultural, plant pathological and entomological aspects of production.

Integrated Pest Management (IPM) is an important component of IFP and entails the complementary integration of various pest control measures into a system which strives to balance maximisation of returns, long-term sustainability and minimisation of environmental impact. The emphasis lies in maximising the potential of the biocontrol complex as the basis for the control strategy with supplementary use of chemical intervention only where essential. Maximisation of biocontrol is multi-faceted, starting with projects aimed at importing and permanently establishing useful biocontrol agents and then using any cultural practices which may facilitate biocontrol activity together with judicious selection of plant protection products to minimise their disruptive effect. The practice of releasing large quantities of insectary-reared biocontrol agents to augment existing field populations is another complementary strategy under development. These guidelines have been developed over many years in pursuit of these ideals.

Historical perspective

Citrus Research International (Pty) Ltd. (previously S.A. Co-op. Citrus Exchange and Capespan) commenced its entomology research programme in 1956. The ongoing programme has primarily been directed towards the economic solution of pressing industry problems. Arising from this there have been

frequent releases of information and the publication of numerous popular and scientific articles.

In 1966 practical information on major pests and their control was consolidated in a single publication termed "A Guide to Citrus Orchard Management". That publication also included information on diseases and horticultural aspects. From 1972 to 1979, the entomologists produced an annual review of recommendations for the control of major citrus pests. Thereafter practical information on new developments in citrus entomology was published at intervals in the "Citrus and Subtropical Fruit Journal", later called the "Citrus Journal", and also the industry's in-house publication "Outspan News".

By 1989 a consolidated review of the pest complex with the emphasis on practical aspects was again considered necessary. It was decided to undertake a publication that would readily permit occasional revision of particular sections. The result of these decisions was the Production Guidelines for Export Citrus Volume III: Pre-harvest plant protection, which was published in September 1992 and incorporated a major contribution from the late Dr M B Georgala. The need to both formalise and further encourage implementation of IPM, which has been used to a varying degree by the citrus industry for many years, coupled with the need for major revisions of several sections of the recommendations, led to the compilation of the 1998 IPM Guidelines. Further updates have been provided as required.

General purpose of the guidelines

The general purpose of these guidelines is to enable growers to formulate effective and economic pest control strategies for each new season which maximise the use of biological control, promote sustainability and minimise environmental impact. To facilitate this, the pros and cons of the various control options have been reviewed in an objective way. In certain respects this has involved a degree of repetition. Sometimes it also requires the reader to refer to different sections in order to get a complete picture of the issues involved.

Throughout the guidelines the underlying consideration has been that they are intended

for an industry competing in the international fresh fruit market with all that this implies. Unfortunately, this means that pest management strategies for pests that are declared phytosanitary pests for certain export markets may need to be so severe that they compromise the ability to maximise biocontrol or even IPM. Where markets have a zero tolerance for an indigenous pest that may be found on the fruit at harvest, control measures may reduce pest populations to levels that are unable to sustain populations of specific natural enemies for that pest in the orchards. In recent years the approach to IPM has therefore changed to rely more on biorational techniques to control some pests without disrupting natural enemies of other pests. Examples are the use of the Sterile Insect Technique, mating disruption, attract and kill, and the use of microbial insecticides such as viruses and fungi.

Using the recommendations

These recommendations focus on practical aspects of citrus pest control and are presented in four sections.

In **Chapter 2** information is provided on various general topics. These topics deal with the supporting structures that are required to organise and execute economic and effective IPM. Detailed information on important pests is presented in **Chapter 3**. The pests discussed do not represent the entire pest complex. However, they are the ones that are most likely to cause problems in major production areas or for certain export markets. The information on each pest is presented under similar headings. In each case the information concerned is largely restricted to issues of practical importance.

For ease of reference the different product options for each pest have been highlighted and treatments are only listed in terms of brand names and quantities required. The order in which these products are listed is not alphabetical but in the order of decreasing suitability for IPM based on information available from experience in the field or bioassays for new products.

A particular product is often obtainable under more than one brand name. To prevent

unnecessary repetition, only one commonly used brand name is used in the text. For alternative brand names, technical information, a list of suppliers and the activity range of the various products, readers are referred to the information provided by AgriIntel <https://www.agri-intel.com/>.

The most important aspect of good pest management remains the grower's footprints in the orchard. Such footprints, plus the accumulation of reliable inspection data and experience, will facilitate growth in the development of economical, commercially acceptable and sustainable integrated pest management strategies.