INTEGRATED PEST MANAGEMENT

FACT SHEET

Integrated pest and disease management (IPDM) is the practice of combining biological, cultural and chemical control practices for the management of pests and diseases in cropping systems.

IPDM is not an organic system, but minimizes the use of chemicals through integrating biological and cultural approaches. Biological control includes the use of predatory insects. Cultural control includes manual or mechanical methods to change the soil or plant environment, such as pruning, mulching and removing infected cuttings. IPDM can be broken down into 5 steps:

1. Knowledge

It's important to know the pests and diseases that can limit productivity in your cropping system. You also need to know which organisms are beneficial for the plants you are attempting to grow, along with their lifecycles, host plant/s and most active months.

An important concept is the action threshold, the point at which a pest species becomes a significant problem (often measured in terms of its economic impact). It is not always economical or effective to act when a pest is first noticed, as many plants can tolerate low levels of attack.

A significant amount of crop-specific research is available online. For example, the NSW DPI has a comprehensive publication: *IPDM for Australian Summerfruit*, which is mainly aimed at commercial growers, but useful to all users.

2. Prevention

Aim to create a resilient crop environment that provides the best chance for natural defence mechanisms to be successful.

Use cultural control practices such as choosing pest resistant cultivars, sourcing clean, pest-free planting material and practicing crop rotation with annual crops.

There are both synthetic and biological chemical control options for pre-treating planting material before sowing. While some responses should wait until an action threshold is reached, other treatments are preventatives, and need to be applied regularly before the disease appears.

Biological control using predatory insects requires the maintenance of appropriate habitat (such as cover crops) and conditions. This aims to build up a high enough predator population to prevent or significantly reduce pest species populations, as their reproductive season begins.

Cover crops can help attract pollinators and pest predators

Kown where to find your pest - weevil larvae is hidden inside this developing Macadamia

Modern tomato cultivars are resistant to key pathogens, creating an excellent cultural control

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3. Observation

Monitoring is the key to making informed IPDM decisions. Regular monitoring enables rapid response if preventative measures are less effective than anticipated, if altered weather patterns affect pest emergence, or if the action threshold is reached earlier than expected.

The appropriate part of the plant must be monitored for different pest species, and in commercial situations an adequate number of samples must be taken to capture a representative view of the crop.

For recreational producers, a simple hand lens, soil testing kit and appropriate online app can enable effective monitoring of most problem species. Commercial ventures may need laboratory diagnostic testing.

It is important to be confident that observations are accurate. Many diseases (caused by a pathogen) and disorders (such as nutritional deficiency or soil traits) often lead to similar symptoms. The Bellinger Landcare website (bellingerlandcare.org.au) lists some of the apps and websites which carefully distinguish the sources of the most common problems.

4. Intervention

Considering the impact of each control action on the whole system is vital to the decision-making process.

If pesticides are used, selective ones are preferred, and they should be applied at the time of year when predatory insects will be least affected. Indiscriminate use of broad-spectrum activity products will reduce the ability of the system to naturally control other pests.

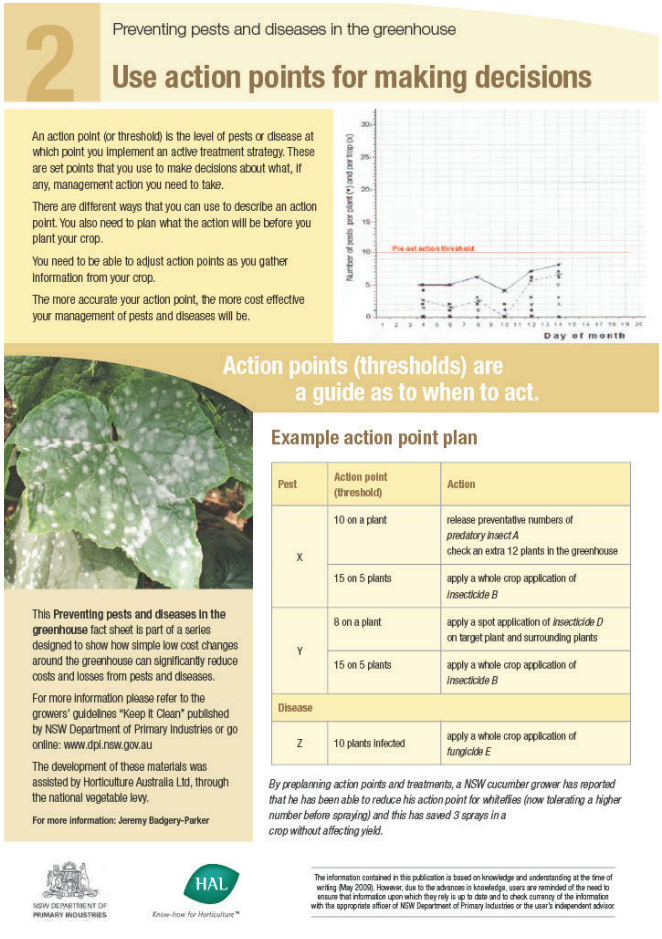
The action threshold is relevant here. It is important to consider the likely economic loss of not intervening, and compare this to factors such as chemical cost, number of applications, machinery and labour requirements and possible impact on other biological control systems. In some years of exceptional weather, or during a transition from heavy chemical use to IPDM, it may be worth accepting short-term crop losses for long term gains.

If the outbreak is only occurring in limited areas of the crop, it may be possible to target those areas only, leaving populations of predatory insects intact throughout the rest of the crop.

5. Evaluation

After each crop cycle the effectiveness of the IPDM can be evaluated, and over several seasons this will help refine the plan.

The cost of interventions, estimated losses, quality of produce, estimates of predatory and target species abundance, and the extent of disease affliction can be tracked against rainfall and weather anomalies, fertiliser use, and the timing of interventions, to assess if the IPDM approach is on track.



Action points (thresholds) guide

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

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For more information (and live links if you have a printed copy) visit bellingerlandcare.org.au