

1 Integrated Crop And Pest Management

1.1 Introduction

The purpose of this publication is to help growers make informed choices best adapted to their individual orchards. The best way to use this guide is to become familiar with it as a whole before using it to answer specific questions during the busy growing season. Integrated Pest Management (IPM) is the guiding philosophy behind this publication. It is a multifaceted approach to maintain pest damage below economically damaging levels.

The word “Integrated” refers to the fact that individual management decisions are not isolated, but take into account, to the greatest extent possible, all aspects of the existing and potential pest situation in relation to the overall farm operation. , In addition to mites and insects, the word “Pest” refers to pathogens that cause disease, weeds, and animals such as deer and voles. Instead of focusing on how to eradicate pests, IPM considers pest biology and all feasible preventive and curative options, and brings them together into an overall “Management” plan. The goal of IPM is to make management decisions that produce results that are economically, environmentally, and socially optimum.

1.2 Practicing IPM

Using IPM requires integrating management tools in a complementary way to create an overall management plan that is efficient, effective, and sustainable. Horticultural practices, such as sanitation and habitat management, are a first line of defense in preventing pest problems. For example, chopping leaves in the orchard in autumn or early spring, or removing wild apple trees in the vicinity of the orchard, can reduce the need for pesticide sprays.

In an IPM program, it is important to accurately identify the pests (insects, diseases, weeds, vertebrates) and assess the risk of damage. See the list at the end of this publication of laboratories in New England that do pest and disease diagnosis, and soil and tissue analysis, for assistance in maintaining crop health and nutrition. An understanding of pest biology and ecology and the influence of factors such as weather and natural enemies on pest abundance will aid the choice of management tactics. IPM programs stress suppression of pest populations to levels that do not cause economic damage, rather than total eradication of a pest. In the case of insect pests, it may be important to have at least some pests present to ensure that natural enemies will remain in the orchard to suppress subsequent infestations.

1.3 Components of IPM

Monitoring (Scouting). Scouting includes detecting, identifying, and determining the level of pest populations

on a timely basis. For some insect pests, traps can be used to indicate pest population density and to identify optimum timing for control measures. For other pests, inspecting foliage, fruit, or groundcover is required. Monitoring individual orchard blocks throughout the season is the most effective way of assessing the insect, disease, and weed situation and, therefore, the need for chemical treatment in each block. Scientifically based, accurate, and efficient monitoring methods are available for many tree-fruit pests.. Brief descriptions of the recommended techniques are given in this manual.

Forecasting. Weather-based pest forecast models can help predict when specific pests are most likely to appear. This information will be referred to for the pests that have such models available. A thermometer and a reasonably accurate rain gauge placed in the orchard can provide useful input for pest prediction and depletion of residue from a previous pesticide application. Alternatively, site-specific weather data are available from private companies (see IPM Resources). An on-line tool called Orchard Radar processes weather data through IPM models, , and is available through the PRONewEngland.org website. Information on the potential for pest outbreaks can also be obtained from Cooperative Extension newsletters and regional crop advisors.

Thresholds. A pest threshold is an estimate of the population density at which treatment is justified because of the risk of economic damage. Thresholds have been scientifically determined by fruit researchers for some pests, For other pests, generally accepted “best guess” thresholds are used. Following the thresholds indicated in this manual has reduced pesticide use by as much as 50%, saving significant money for growers. The term **suggested action threshold** is used in this publication to denote situations in which the decision to apply a pesticide or not can be made primarily on the basis of a properly timed visual inspection of the orchard.. Good judgment should be exercised in applying general advice to individual orchard situations. Your knowledge and records of block history are an important resource for site specific management decisions. While the suggested thresholds are not always exact, they represent the best guidelines available to the commercial grower concerned with effective and efficient management of tree-fruit pests. For more detailed information on any aspect of these recommendations, consult your regional Extension specialist.

Management tactics. Appropriate management tactics to control pests include cultural, biological, and physical controls, as well as chemical controls when needed. Taking advantage of some of the simple and relatively inexpensive pest management methods described in this manual can result in significant savings both in terms of pesticide use

and crop loss. Often a thoughtful preventive measure taken before the pest is a problem can result in significant savings of -rescue treatment expenses or crop damage costs later in the season.

Recordkeeping. A yearly record of pest monitoring observations, treatment actions, and end of season damage assessment provides a valuable reference tool for future decisions, and is much better than relying on memory. Keeping records, reviewing them, and taking action based on them improves pest management results and also serves as documentation to justify actions and verify compliance with regulatory or customer requirements.

1.4 IPM Tactics

The toolbox that can be used to manage pests includes more than just chemicals. In fact, decisions made before planting and at planting can greatly reduce the need for subsequent pesticide use.. Here is an outline of the types of tools that should be integrated into an overall management plan.

Pest-resistant varieties. If available, insect and disease resistant or tolerant varieties or rootstocks can reduce losses to pests. Using these varieties can be one of the simplest methods of reducing management costs and the risks of economic damage or negative personal or environmental impacts.

Cultural and physical controls. Remove sites where pests overwinter, such as dead or dying wood, prunings, mummified fruit, suckers, nearby unmanaged fruit trees, and alternate host trees.

Ensure vigorous tree and crop growth through proper nutrition and weed control to avoid stress that may increase risk of predispose damage by insects, diseases, or physiological disorders.

If irrigating, manage irrigation schedules to avoid long periods of leaf wetness or high relative humidity, which encourage diseases to develop

Avoid planting trees into areas of known, high pest pressure.

Orient orchards to provide maximum air drainage and circulation. If possible, remove hedgerows of wild shrubs and trees immediately adjacent to the orchards. These block sun and air movement, keeping trees wet longer which encourages growth of some disease organisms.

Biological control. Conserve natural enemies of insect and mite pests by only using insecticides, miticides, and fungicides when needed. Select pesticides that are effective against the targetted pest(s) with minimal negative impact on t predators, parasites, pollinators and other beneficial organisms. Make “seeding” releases of predator mites if practical.

Chemical control. Only use pesticides if pest pressure, monitoring, economic thresholds, or disease forecasts indicate a need.

Choose pesticides according to efficacy, , applicator safety, resistance management, and impact on the environment and natural enemies.

Ensure full and uniform spray coverage by using recommended pesticide dosage, accurately calibrated equipment, optimum spray pattern, travel speed, droplet size, and enough water..

Do not apply pesticides when wind velocity is more than five miles per hour to avoid drift to nontarget sites.