RESEARCH LABORATORY TECHNICAL REPORT

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IPM for Landscape Plants

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Maintaining the health and vigor of trees and ornamental plants is the best defense against insects, mites, disease, and other plant stressors. Integrated pest management (IPM) is an approach to plant health care that involves making timely management decisions that mitigate pest damage and promote plant health. IPM programs include the prevention of pests, early detection of pest populations, and a prescribed treatment regimen if a pest outbreak occurs.

Why choose IPM?

The goal of IPM is to prevent and manage pest outbreaks in an environmentally sustainable manner. Pest management can be accomplished using multiple tactics (cultural, mechanical, biological and chemical controls) that vary in suitability, selectivity to the target, and efficacy. Landscape IPM tools and goals often differ from other areas of pest management. Frequently, the goal is to maintain stressors below a threshold so that the plant can recover from injury and grow unimpeded. This is in contrast with situations where plant yield (agriculture), uniformity (nursery production), or pest eradication (urban IPM) may be prioritized goals.

Alternative pest management strategies often focus on routine cover spray applications without accurate pest identification and inspection of pest abundance and life stages. As a result, they are often incorrectly timed (e.g., after most of the damage has occurred or during an incorrect pest life stage). Cover sprays generally use broad spectrum, persistent pesticides that may have negative impacts on non-target organisms such as pollinators and naturally occurring biological control organisms. Unfortunately, this strategy may lead to dependency on further chemical applications to maintain pest suppression.

Figure 1: A plant health care specialist using a hand lens to inspect shrubs

Components of IPM Programs

Prevention

In landscape settings, diseases and insects are often not the root cause of declining plant health. Rather, cultural problems such as soil compaction, poor pruning methods, and incorrect plant selection lead to poor plant condition and increased susceptibility to pest attack. Cultural management practices, such as routine pruning, proper mulching, and sufficient irrigation will keep landscape plants healthy and promote natural plant defenses. Promoting plant defenses is the first step in a successful IPM program where plant health is prioritized.

Detection

A trained plant health care specialist monitors specified plants on each property to detect and mitigate pest injury. Specialists use tools (Figure 1) to inspect key plants and may set up insect traps or collect samples to monitor pest presence or population density.

Scouting for potential pests and diseases is aided by knowledge of growing degree days (GDDs). Modeling the accumulation of GDD values over time can allow for prediction of pest activity during the season. When pest activity is anticipated, susceptible plants can be prioritized during the monitoring visit. Similar models can help predict outbreaks of certain key diseases by measuring humidity, temperature, and precipitation.

After scouting, the property owner or manager receives a detailed report of problems that have developed, which plants were affected, and what action was taken by the plant health care specialist. This record-keeping system aids in tracking plant health patterns and can be helpful in predicting future outbreaks.

Figure 2: Predatory minute pirate bug

Treatment

IPM relies on the selective use of management tactics, which are applied to affected plants rather than the entire property. Depending on the pest species and/or severity of the outbreak, the plant health care specialist may incorporate one or multiple tactics to manage the pest, including mechanical removal (e.g., pruning out infected branches, scrubbing the tree with a soft brush), biological control releases (e.g., predatory insects, parasitoids, entomopathogens) (Figure 2), and/or chemical applications (Figure 3).

Figure 3: Treatments are selectively applied only to active pests on affected plants

This comprehensive approach permits control of pests in an environmentally sustainable manner while, in many cases, reducing dependence on frequent chemical applications.

Advantages of IPM

Many plant health problems are overlooked when a routine spray program is implemented. With IPM, properties should be visited frequently so that problems can be identified while there is time for early corrective action. In many cases, addressing cultural problems will suppress or eliminate secondary disease and insect issues without any additional treatments.

Applying IPM principles to managed landscapes is a new concept, but practices are based on IPM models used successfully in agricultural plant protection for many years. The Bartlett Tree Research Laboratories has adapted many of those techniques and developed a landscape IPM program uniquely suited for residential landscapes. Please contact your Bartlett Arborist Representative to learn about specific management strategies.