

RESEARCH LABORATORY TECHNICAL REPORT



The MoniTor® Rx IPM Program

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The MoniTor® Rx Integrated Pest Management (IPM) Program is designed to minimize landscape pesticide inputs. When needed, woody landscape plants are protected with products that are certified organic (OMRI) or based on naturally occurring materials. The original MoniTor® IPM Program has a proven record of reducing pesticide use by 90%. MoniTor® Rx programs emphasize plant health and regular monitoring for pest activity by a skilled pest management specialist. When pest management is necessary, naturally based materials and techniques are employed. This program protects the environment, promotes landscape ecosystem health and can reduce anxieties regarding the toxicity and persistence of man-made pesticides.

In addition to the MoniTor® Rx IPM Program, Bartlett offers more targeted, naturally-based pest management for specific pest problems. If only one or two pest problems require management, treatments using organic or naturally based products can be employed against these pests. For example, Bartlett offers a natural management program to control ticks that may carry human disease.

MoniTor® Rx for landscape problems is most successful when a well-considered combination of cultural and product treatments are utilized. Cultural practices that increase plant vigor and reduce plant stress form the foundation of the program. Your Bartlett Arborist Representative can provide expert advice on pest resistant plants for your landscape and various cultural practices that will reduce plant stress and naturally minimize pest populations.

Program Differences

The MoniTor® Rx IPM Program differs from standard programs in the following ways:

1. For most landscapes, MoniTor® Rx will require more frequent inspections than a standard program. Early detection of pest outbreaks is even more critical

with MoniTor® Rx. Most products used within this program are less persistent and less toxic than standard synthetic pesticides and require careful timing.

2. MoniTor® Rx includes flexibly timed inspections to treat difficult outbreaks with appropriately scheduled treatments. Additional inspections are added on an “as needed” basis only. Pests requiring intensive monitoring include gypsy moth, Japanese beetle, and lacebugs.

3. Horticultural oil treatments in the fall or early spring are critical for the success of MoniTor® Rx. Specialists also make applications of horticultural oil for aphids, adelgids, and other pests as needed during the growing season.

4. Plant soil nutrient needs (i.e. fertilization) in the MoniTor® Rx Program are managed with Bartlett’s Soil Rx Prescription Fertilization. This can include OMRI certified organic blends. In this program, the Bartlett Tree Research Labs will develop a custom fertilization plan for your property based on soil sample analysis. We then create a blend to specifically address identified deficiencies without providing

unnecessary nutrients that could potentially harm the environment.

5. MoniTor® Rx may provide biological control releases as an optional feature of the program. Releases for a residential property may include

Figure 1: Green lacewing larva feeding on an aphid



beneficial organisms such as ladybugs, green lacewing larvae, predaceous mites, aphid-eating midges, and many others (Figures 1 and 2).

6. MoniTor® Rx will be conducted with products listed on this technical report. Your Bartlett Arborist Representative can review this product list and customize your program to use only those products that you prefer. If pest management cannot be achieved with these products, your Arborist Representative will provide information about alternatives. Only with your consent will these alternatives be applied.

Pest Management

The pest control products used in the Bartlett MoniTor® Rx IPM Program are as follows:

Horticultural Spray Oil

Horticultural spray oil, has been successfully used for pest control for more than 100 years. This highly refined mineral oil, sometimes known as “dormant oil,” is approved by the National Organic Standards Board for use by organic farmers. Spray oils effectively control a wide range of pests including scale insects,

mites, aphids and adelgids. These oils are considered very low risk to humans, pets and the environment. In addition, horticultural oil is less harmful to beneficial insects and pollinators than most other pesticides.

Neem Oil Extract

Neem oil, which comes from seeds of the neem tree, is a naturally occurring pesticide. It has been used for centuries for medicinal, cosmetic and pesticidal purposes. Clarified hydrophobic extracts of neem oil, which are certified organic, are used to control many soft bodied insect pests. This product is also known to have activity against fungal mildew and rust diseases. Residues of neem oil extract degrade naturally in the environment and pose little risk to beneficial insects or pollinators when applied correctly.

Pyrethrins

Figure 2: Predaceous mites are an excellent biological control for plant damaging mites



Pyrethrins are natural insecticides extracted from the flowers of chrysanthemum daisies. They rapidly biodegrade and have few adverse effects in the environment. Pyrethrins are approved by the National Organic Standards Board for use by organic farmers and are EPA registered for use on most food crops. The formulation used by Bartlett contains

piperonyl butoxide (PBO), an extract from a Brazilian species of sassafras that improves the effectiveness of pyrethrins.

Abamectin

Abamectin is a member of a novel class of compounds naturally derived from the soil microorganism *Streptomyces avermitilis*. This material is ideal for use in IPM programs because of its low impact on beneficial insects and the environment. Abamectin is absorbed by plant foliage and is highly effective against spider mites.

Spinosad

Spinosad is created from the fermentation of a naturally derived organism. Formulated products with spinosad are highly effective at low use rates and quickly stop feeding of target pests. Spinosad degrades rapidly in the environment and does not pose a threat to groundwater. Provides excellent control of caterpillars, sawflies, thrips, and leaf beetles.

Insect Growth Regulator

The insect growth regulator, pyriproxifen, mimics a hormone specific to insects and disrupts development. This product prevents insect eggs and immature stages from maturing into adults. It is effective against scales, whiteflies and other sucking insects. Researchers investigating the impact of pyriproxifen on biological control found that populations of beneficial insects were conserved compared to application of conventional insecticides.

Disease Management

The principal fungicides used in MoniTor® Rx are based on naturally occurring anti-fungal compounds. The active ingredients are in a class of fungicide compounds known as strobilurins. These chemicals are produced in nature by wood decay fungi to eliminate competition by other fungi. Strobilurins are very active against fungal disease at extremely low rates of application, and have minimal effect on people, pets, non-target organisms and the

environment. Strobilurins are degraded by sunlight and microbes within weeks and the end product of degradation is carbon dioxide. Studies show that the potential mobility in the soil is very low. Strobilurins are systemic fungicides, meaning they are absorbed by the plant cells rather than acting solely as a surface barrier, and are active against a broad range of plant disease fungi.

Other products that Bartlett uses in disease management programs are copper fungicides, sulfur, and potassium phosphite. Copper is derived from natural minerals and has been used for centuries to manage plant diseases. The copper product used by the Bartlett Company is registered as an organic material for use on fruits, vegetables, and ornamentals. Sulfur is an organic fungicide for suppression of mildews and leafspots. Potassium phosphite was developed as a fertilizer but is also effective for control of certain diseases. When applied to plant tissue, phosphites induce a resistance response by the host plant that impedes establishment of certain fungal and bacterial diseases. Recent research has shown that phosphites are particularly effective in combating root disease caused by Phytophthora.

Cultural practices that maintain plant health are integral to preventing plant disease. Monitoring, sampling, pruning, irrigation management and maintaining soil fertility are key practices in preventing disease.

Soil Management

Severe nutrient deficiencies of small trees and shrubs are also treated in the MoniTor® Rx program. Organic and natural fertilizers and soil amendments are used as needed on specified plants. Products for treatment of deficiencies include Boost Natural and other granular organic fertilizers. Soil pH correction often requires a long term treatment program that may be integrated within MoniTor® Rx.

For more general nutrient and soil concerns that are addressed outside of the MoniTor® Rx program, Bartlett offers its Soil Rx Prescription Fertilization program for managing soil nutrition problems of landscape plants. Soil Rx begins with a soil analysis to determine pH, nutrient and organic matter content, and other key soil characteristics. A specific prescription is then developed by the Bartlett Tree Research Laboratory based on soil analysis results, the plant species need and the landscape goals for the plants. Only the nutrients that are required are applied. Deficiencies in organic matter and compacted soils are addressed with our exclusive Bartlett Root Invigoration™ program.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.