PHC – What it Means to You

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Plant Health Care (PHC) is a short title for a relatively new concept with very large potential. PHC is a systematic approach to the care of trees and other landscape plants that can save you money, save your trees, and save our environment from ever-increasing amounts of toxic chemicals.

PHC, IPM, PHCIIPM — it's a confusing alphabet soup of acronyms. But with a little understanding of the history of these terms and some clarification of their subtle differences, a promising new concept emerges. The idea has been captured in the phrase Plant Health Care, and it is of major importance to homeowners, businesses, arborists, tree boards, and anyone else who cares about trees and our environment.

Perhaps the story begins in 1962 with Rachel Carson and the publication of *Silent Spring*. Carson, a scientist as well as a gifted writer, warned the world about the effects of unbridled dumping of pesticides on fields, woodlands, and wetlands. She talked about the uptake and concentration of toxic chemicals in the food chain. She pointed out the hopelessness of controlling pests with poisons because resistant strains would surely develop through the genetics of surviving insects and diseases.

One response to *Silent Spring* was legislation such as the banning of DDT. Another was an agricultural practice called Integrated Pest Management (IPM). For several decades, IPM has been used by many farmers to reduce chemical applications on cropland. The key to IPM was (and still is) monitoring pest populations, looking for alternatives to traditional chemical treatments, and applying chemical controls only when a specified threshold of economic loss was exceeded.

The concept was eventually incorporated into landscape maintenance, but thresholds of economic loss were not easily established. There was also confusion over the name. Should it be pest management or plant management? Finally, arborists had difficulty explaining to homeowners how they could benefit from it.

Enter the idea for PHC early in the 1990s. Championed by the International Society of Arboriculture Research Trust, the National Arborist Association, and the U.S. Forest Service, PHC incorporates some of the practices and tenets of IPM, but goes far beyond.

The goal of Plant Health Care (PHC) is beautiful and healthy landscapes using the least toxic methods of pest control.

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What Is Plant Health Care?

Plant Health Care is defined by the International Society of Arboriculture as a holistic approach to plant care that focuses on the health and growth of the plants. Unlike IPM, which focuses on monitoring and controlling pests, PHC begins with proper soil preparation and proper plant selection, includes preventive care, and incorporates pest management. Importantly, pest management is used only when damage warrants, and any control methods selected are those that are the most environmentally friendly.

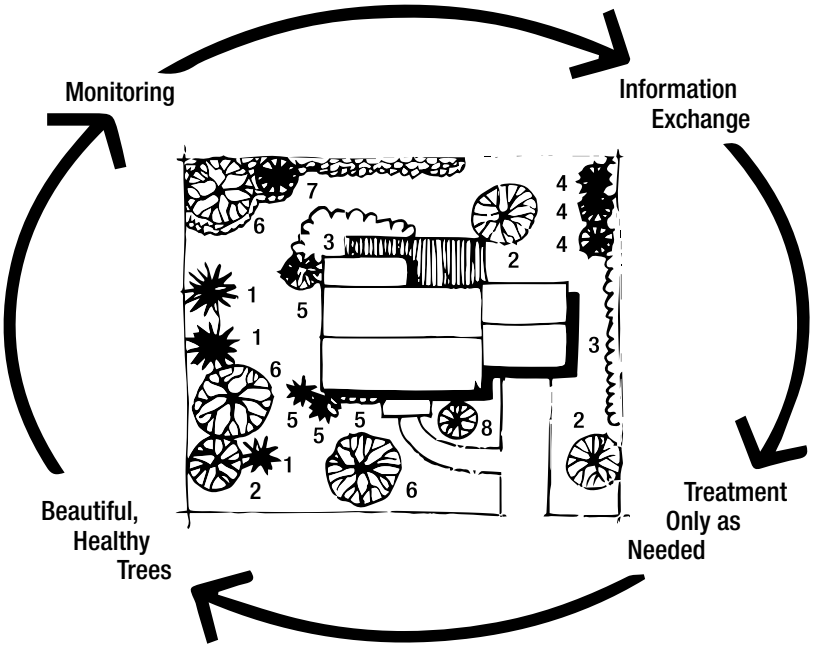
PHC is a concept whose time has come. Each year more than 1 million pounds of chemical pesticides are used in the United States alone. A large percentage of these end up on lawns and foliage around homes, businesses, streets, and public parks. The result has led to increasing complaints from citizens concerned about groundwater contamination, effects on wildlife, and more subtle ecological impacts, such as the loss of earthworms and the development of strains of insects that are resistant to pesticides. PHC is a positive response to these concerns.

PHC is important for another reason. According to the ISA, few urban trees planted in recent years will reach maturity without intervention to counter the stresses of air pollution, weather extremes, poor soil, compaction, and bad planting techniques. PHC provides the necessary intervention and does it on a regular basis throughout the year. It is to trees what a wellness program is to humans. The emphasis is on prevention of problems, but it can also help with a cure when things go wrong.

PHC is most often a service offered by progressive tree care companies. However, it is a concept that can be adopted by institutional groundskeepers, community foresters or arborists, and even do-it-yourself homeowners.

Benefits of PHC

- Detects potential problems early.
- Improves tree health.
- Extends the life of trees.
- Saves money by breaking the cycle of constantly reacting to problems.
- Reduces the use of chemicals through use of alternatives and spot applications timed for maximum effectiveness.
- Reduces loss of beneficial insects through more precise targeting of controls.
- Enhances homeowners' knowledge of trees and the urban ecosystem.



PHC begins with a landscape map with each plant keyed with a number for easy recordkeeping. A professional periodically monitors the grounds, reports findings to the property owner, and prescribes least toxic treatments. All actions are based on actual current conditions and a level of tolerance the property owner expresses toward normal insect or disease activity.

The Steps in PHC

1. Prevent Problems

The surest route to tree health begins with following the basic rules of responsible tree planting. For more information, obtain the Tree City USA Bulletin on these subjects:

- Selecting the right tree or shrub for the site (*Bulletin No. 4*)
- Supplementing native trees with cultivars that have been developed for resistance to local pests or other adverse conditions (*Bulletin No. 26*)
- Planting correctly and allowing adequate space for roots and crown growth (*Bulletin No. 19*)
- Adding mulch and watering when rainfall is inadequate (*Bulletin No. 5*)

2. Learn to Tolerate Some Bugs

Insects are a normal part of the urban ecosystem. Many are beneficial, serving as predators for other insects. But even those that munch or curl leaves can live in harmony with trees unless their numbers get out of hand. A key to reduced chemical use is to develop a tolerance for insects. This will vary with individuals, the kind of insect in question, and even on a tree-by-tree basis. For example, less tolerance might be expected for gypsy moths than for spider mites, and for aphids in an oak tree over the patio than on a hawthorn by the backyard fence. Similarly, some fungi and plant viruses should be expected to always be found in the landscape.

3. Monitor Regularly

Monitoring is usually a job for professionals. They must have a good knowledge of plant species and what pests can be expected on each. The monitor (sometimes called a scout) must also be able to identify insects and diseases, know their annual life cycles and potential for doing damage, and be able to recommend appropriate treatments when necessary. Specialists and diagnostic services are available at most land grant universities to help with difficult or uncommon cases.

Frequency of monitoring varies. Some tree care companies visit their clients' properties every two weeks during the growing season; some visit eight to 10 times a year; some less often. The intensity of inspections also varies. In some cases, only key plants are inspected. These may be especially valuable species or those prone to certain pests active at the time of the inspection. Similarly, in some cases, monitors look only for key pests — those known to be troublesome locally. From these inspections, a priority treatment list can be developed that is both realistic and economical. Prescriptions and treatments are then recorded for each tree on the property's landscape map.

4. Inform and Discuss

At the outset of using PHC on a property, the owner is interviewed. This is to determine his or her goals for the land and to what extent insects or other pests might be allowed to disturb its aesthetic qualities.

Monthly, or after each inspection trip, the PHC client receives a report on findings and recommendations. This is written in plain language rather than technical jargon. Through this regular communication, the mystery behind tree care is removed and the landowner knows that treatments are within the guidelines he or she established. In other words, the PHC program is entirely customized based on the owner's desires and the needs of the vegetation. This system is also educational for homeowners and reassures them that their investment in trees is in good hands.

5. Treat Problems Intelligently

Under a PHC program, treatment includes routine tree maintenance, such as deep watering, fertilizing as needed, repair of storm damage, mulching, and soil aeration. It also includes selecting the best method of control when insect damage exceeds the level pre-determined through interviewing the property owner. "Best method" is defined not only in terms of low cost but as the one with the least adverse impacts on the environment. It controls the problem insect or disease without destruction of its natural enemies or other beneficial organisms. The goal of PHC is to use the minimum treatment that still gets results.

The Tools of PHC

Within the tenets of PHC, prevention is the first line of defense against tree problems. But sometimes even careful species selection and the best of care is not enough.

The second line of defense is species diversity. By landscaping with a wide range of trees and shrubs, a problem that affects one tree may not spread and cause the kind of widespread destruction common when a single species is overplanted. Even then, however, there are times when pest control is the only alternative to unacceptable damage or tree loss.

When control becomes necessary, the goal of PHC is to sort through the available tools and find the least toxic method for dealing with the problem. Here are some alternatives to traditional methods, such as broadcast spraying. They are suggestions from the Rio-Integral Resource Center of Berkeley, California, and others who are working to reduce our reliance on chemicals for landscape maintenance.

Regular landscape monitoring keeps treatments to a minimum, ensures proper timing for maximum effectiveness, and enhances communication between professionals and property owners.

Tree banding used for cankerworms

Barriers

- ✓ A burlap band can trap large caterpillars, such as codling moths or gypsy moths. Regular removal and cleaning is needed to ensure effectiveness.
- ✓ Bands of sticky adhesive, such as Tanglefoot® or Stickem®, also trap caterpillars.
- ✓ Where aphids are present, ants often harvest their excretions, sometimes "farming" and protecting the aphids from natural enemies. A sticky barrier will keep the ants away and allow the natural predators to do their work of controlling the aphid population.

NOTE: Barriers are most effective on trees when crowns don't touch one another.

Minimizing Nitrogen

- ✓ Aphid and scale reproduction is believed to be enhanced by high levels of nitrogen in plants.
- ✓ If these insects are a problem and you *must* fertilize, avoid highly soluble nitrogen fertilizer. Instead, use ammonium or urea-based forms, compost, or manure.

Eradicative Pruning

- ✓ Many insect pests and tree diseases can be successfully pruned out of a tree.

Biocontrols

- ✓ Avoid routine preventive sprays or general applications of insecticides that may destroy beneficial insects. Encourage birds by providing water, artificial homes, snags for woodpeckers, and other habitat needs.
- ✓ Attract a variety of beneficial insects by planting daisies, yarrow, zinnias, alyssum, or other members of the Apicaceae and Asteracae families.
- ✓ Introduce lady beetles and other insect predators that are commercially available. Diversity of plant life in the landscape helps keep them from straying off.

Careful plant selection and systematic care reduce stress that predisposes plants to insect and disease problems. Diversity of species helps control the buildup of abnormal pest populations and limits damage when outbreaks do occur.

Well-Timed, Low-Toxicity Spot Spraying

When an insect population gets out of hand or when disease threatens, pesticides may be necessary. For the most effective use, applications must be precisely timed to match the most vulnerable point in the pest's life cycle. PHC experts can determine this contact time, and it is sometimes listed on the label of pesticides. For the safest use of pesticides, treat only affected trees or those high on a pre-determined priority list. To ensure the least chance for secondary effects, use:

- ✓ Biopesticides instead of petrochemicals. For example, tiny worms called nematodes are contained in a mixture under the brand name BioSafe Systems®. This biopesticide can be sprayed on trees to attack the larvae of wood borers, Japanese beetles, and bark beetles.
- ✓ Bacterial insecticides, such as Bacillus thuringiensis (Bt), when leaf-eating caterpillars are out of control.
- ✓ Low-toxicity extracts from the neem tree for controlling gypsy moths, Japanese beetles, aphids, scales, mealybugs, thrips, leafminers, and others.
- ✓ Horticultural oils and soaps that smother aphids, scales, mites, and other insect targets during certain times during their life cycles.
- ✓ Pyrethrin, a wide-spectrum insect nerve toxin derived from flowers that have low mammalian toxicity.
- ✓ Silica aerogel/pyrethrin in aerosol cans with applicator tips that can carefully direct the spray; a white residue shows exactly where the application has been made.

Wanted – A New Attitude

Men and women in the tree care industry face a dual challenge when it comes to pesticides.

One of these challenges is to stay abreast of new technology in a rapidly changing world. It is a matter of trying to learn the "right" thing to do, then adjusting established practices to adapt to the new methods or materials. PHC is a good example. ISA's *Arborist News* once expressed the challenge this way:

Commercial and municipal arborists have a monumental task caring for trees in the urban environment ... All too often arborists have been forced to exercise crisis management because inadequate attention was given to post-planting care and maintenance. There are thousands of tree species and cultivars with each having its own climate and cultural requirements and each prone to a variety of pests.

With the beginning of the chemical age, arborists used pesticides to combat the many diseases and insects of landscape plants. Sometimes these chemicals were used with too little discretion. Sometimes they seemed to be used properly given the knowledge at the time, but new research later showed them to have long-term detrimental ecological impacts.

With more research results in hand, we have learned that only a few insects are pests. New chemicals were developed that targeted specific pests, but our treatment strategies remained the same. We fell into the rut of constantly reacting to the presence of pests with ever more treatments.

With the advent of PHC, progressive arborists now have:

- Effective alternatives to using pesticides alone.
- Better knowledge of the systems of living organisms interacting on the land.
- The ability to facilitate natural processes rather than disrupt or destroy them.
- A responsible technology for managing plant health that will benefit society.

The second challenge is for the professional community to promote PHC and its technology to customers and the general public.

According to a study by the Environmental Protection Agency, suburban residential property receives a greater quantity of pesticides per acre than farms or any other land use. Despite Rachel Carson and the rise of environmental concern, many homeowners have not followed through with actions that are consistent with responsible environmental stewardship. Studies by Professor John Ball of South Dakota State University and others have found that respondents from 40 percent of all households surveyed wanted to eliminate pests, and 30 percent were unwilling to accept even slight damage on plants in return for reduced pesticide applications.

Education of the public is clearly a key to the wider adoption of PHC. It is largely a matter of attitude, and it is a job for all of us.

What You Can Do

- ✓ From credible, fact-based sources, learn more about the effects of pesticides and other chemicals on groundwater, surface water, wildlife, and other parts of our environment — and on human health.
- ✓ Tell others about the availability of PHC as a better method of tree and lawn care. Share copies of this issue of Tree City USA Bulletin. See page 8 for ordering information.
- ✓ Hire tree care companies that offer PHC services. Encourage the adoption of PHC if no companies in your community have adopted this relatively new practice.
- ✓ Understand that arborists must be paid for inspection services and minimum-impact treatments. It is like paying a doctor even when he/she finds you to be in good health.
- ✓ Encourage the use of PHC concepts in your community forestry program — and personally where you live.

Once considered state-of-the-art tree care, widespread spraying is now being replaced by methods that are safer, less expensive, and more effective in the long run. Chemical reduction is everyone's job, and the challenge requires new thinking and more knowledge of urban ecosystems.

The Bio-Integral Resource Center: *A Model for Action*

For more than 35 years, a small group of dedicated individuals has championed the cause of responsible pest control. More than simply a voice or a group of activists against pesticides, the Bio-Integral Resource Center (BIRC) of Berkeley, California, has helped pioneer ways to control insects while at the same time safeguarding environmental quality.

The accomplishments of this model organization are remarkable. Through the design of integrated pest management techniques, BIRC was able to help the National Park Service reduce pesticide use by 70 percent in three years. BIRC's suggestions for city trees in Berkeley resulted in a 90 percent reduction in pesticides and a savings of $22,500 during the first year of the program. In citrus orchards, savings of one-third the usual cost of pest control have been demonstrated.

BIRC is a nonprofit organization that offers technical advice, assistance, training, and educational materials on the least toxic route to pest control. BIRC's staff and volunteers are advised by an international board of distinguished scientists and pest control industry personnel. The organization's facilities include a large library and system of computerized databases. Support comes from memberships, consulting contracts, foundation grants, and an array of partnerships with industry, government, and educational institutions. BIRC's international efforts have included an interesting program in cooperation with the People's Republic of China. The program provided BIRC with access to little-known information about non-toxic pest control methods and products that have been used for centuries in China. In return, BIRC provided information to institutions in China seeking to modernize agriculture with minimum reliance on toxic materials.

Members of BIRC can receive advice on least toxic methods for solving any pest problem in any location. To date, BIRC's membership program has allowed it to:

- Assist thousands of individuals in reducing use of conventional pesticides both indoors and outdoors.
- Help educate policy makers about reducing pesticides in schools, parks, and workplaces.
- Familiarize hundreds of professional pest control operators about less toxic alternatives.
- Help farmers, nursery personnel, and natural resource managers rely less on toxic materials.
- Create training manuals for EPA, U.S. AID, state and local parks, school districts, and others.
- Develop model policy documents for use by grassroots organizations to change pesticide policy at the state and local levels.

For more information, contact BIRC, P.O. Box 7414, Berkeley, CA 94707 or see page 8 for a direct link to BIRC's website.

How to Find Environmentally Friendly Pest Control Products

Neem extracts, Bt products, friendly nematodes, predatory mites, sticky tree barriers, and pheromone traps — these and dozens of other items are helping to cut down on conventional chemical sprays used in the battle to protect trees. But where do you get these products? Hearing about them is one thing, but finding a source is often the barrier to using them.

The problem is solved by BIRC's *Directory of Least Toxic Control Products and Services*, now available free online or in print for a nominal cost. For the print version, contact BIRC at the above address.

Making Life Healthier for Pollinators

According to Joe Lamp'l, host of the award-winning television series, "Growing a Greener World," it is estimated that "more than 1,300 types of plants are grown around the world for food, beverages, medicines, condiments, spices, and even fabric. Of these, about 75 percent are pollinated by animals. More than one of every three bites of food we eat or beverages we drink are directly because of pollinators. Indirectly, pollinators ultimately play a role in the majority of what we eat and consume."

Honey bees are perhaps the most important pollinator, although the work is also done by wasps, ants, beetles, lizards, bats, butterflies, and birds. These animals are key links in the chain of life and, unfortunately, it is well-known that bee populations, especially, are in decline. Pesticides are suspected as being one of the main reasons for the endangerment of honey bees and is one more reason why adopting the practices of PHC is so important.

Adopting the practices of PHC and IPM can help reverse the downward trend of pollinators in America and ensure a healthier living environment for all.

For More Information

For links to more information about the Bio-Integral Resource Center and other topics in this bulletin, please visit **arborday.org/bulletins** and click on Bulletin No. 37.

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