Balancing Nature Within Your Landscape

A healthy, naturally balanced landscape will not only provide you with healthy plants, but also will protect and preserve our environment for future generations. What is a balanced landscape? It is a healthy landscape that contains a wide variety of beneficial insects and predators as well as a tolerable level of damaging pests. A balanced landscape works with nature without a large need for outside inputs.

Defining Natural Predators

Natural predators are organisms that kill or reduce the population of other organisms. In our landscapes, these would be organisms potentially harmful to plants. In terms of pest management, natural predators are of interest since they can limit pest damage without the use of harmful pesticides. The broad definition of "natural enemies" includes organism that can attack harmful pests in a number of ways:

- **Predation:** A predator is an organism that attacks, kills and feeds on one or many other individual organisms (prey) during its lifetime. Some predators are specialized in that they feed on only one or several prey. Other predators may feed on a wide variety of other organisms. These beneficial organisms can range from small insects to large carnivores such as raptors, moles and other animals.

- **Parasitism:** Parasites are micro-organisms that live and feed in or on larger hosts. They have a specialized relationship with their prey, usually parasitizing only one host over their lifetime. Parasites that kill or significantly weaken harmful prey are important in biological control programs.

- **Competition:** Competition occurs when two or more organisms compete for the same limited resources. Generally if left alone, the stronger or those organisms with superior numbers will thrive. Competition can become important with respect to weed control and to a smaller extent with beneficial insects, however its use in biological control is limited.

Defining Biological Control

Biological control is the concept of a beneficial organism attacking a harmful organism, reducing its numbers, thus reducing the amount of plant injury. Living, natural enemies are important control agents in this program. For this program to work, the beneficial organisms must be at a population that will keep harmful pest populations low. This will keep damage to your plants at a tolerable level. With this in mind, several factors need to be observed concerning biological control:

- Beneficial organisms must be present in the landscape.
- Some damage must be tolerated in the landscape.
- A small number of pests need to be present as a food source for the natural enemies.
- Chemical pesticide usage must be kept to a minimum.

Using Biological Control

Virtually every pest around has a natural enemy. When balanced, these natural enemies will keep the harmful pest population to minimum reducing plant damage. These beneficial organisms often go unnoticed by homeowners and landscapers until the natural balance is disrupted, usually caused by pesticide use. Once this happens, resurgence of the pest is usually quicker than the beneficial organism resulting in an increase in plant damage. Learning to recognize and identify both beneficial and
harmful insects is essential for a biological system to work. Monitor your plants often. Below is a short list of natural enemies that can be found in your landscape:

- Lacewing larvae
- Plant bugs
- Earwigs
- Lady beetles
- Soldier beetles
- Wasps
- Syrphid larvae
- Aphid flies
- Assassin bugs
- Bigeyed bugs
- Damsel bugs
- Birds
- Ground beetles
- Spiders
- Minute pirate bugs
- Viruses
- Bacteria (B.t. pathogen)
- Midge larvae
- Skinks
- Anoles

**Integrated Pest Management (IPM)**

Promoting a natural balance of beneficial organisms and pest in your landscapes is not only environmentally sound but is also cost efficient. However, there are occasions where harmful pests will out number those beneficial organisms. The Integrated Pest Management (IPM) program allows for the use of pesticides only when needed. IPM brings together the natural balance of your landscape with targeted, low lethal pesticide applications to prevent plant loss. For more information see [HGIC 2755, Integrated Pest Management](https://www.ars.usda.gov/∼/m Nhà atory/RR-92/IPP/PPC/HGIC2755.PDF).

**Five Key Components to IPM**

- Preventing pest problems from occurring
- Constant monitoring of your landscape and scouting for all organisms
- Positive identification of all insects in the affected area, both beneficial and harmful
- Proper selection of chemical control using plant damage thresholds as a guideline to treatment
- Proper application of any pesticide using label recommendations and calibrated application equipment

**IPM Defined**

**Prevention:** Biological controls often suppress harmful organisms early during an infestation. As pest populations increase, beneficial populations will also increase preventing outbreaks that could cause damage. In the event that natural enemies do not achieve the level of pest control, added beneficial organisms can be released to keep pest levels low.

Another way to aid in preventing pest outbreaks is through proper plant selection, positioning, planting and care. Healthy plants, located in areas where they will thrive, are better able to withstand minor infestations of pests and recover with an acceptable level of damage.

**Monitoring Your Landscape:** Carefully monitoring your landscape on a daily basis will give you insight on plant health, beneficial insect numbers and pest counts. Monitoring techniques will vary depending upon the beneficial insect or pest. Insects can be seen with the unaided eye or with a hand lens, or be counted in traps. Diseases can be diagnosed by observing plant symptoms or plant and soil samples can be submitted to the Plant Problem Clinic for a professional diagnosis. Weed populations can be determined by using a rope or line to transect a portion of the lawn. Walking down the line, counting your steps and the number of weeds at each step, will give you a percentage of weed plants at the site. Count the steps where you saw a weed species then divide by the total number of steps used down the length of line.

Monitoring is a key component of the IPM program and it is extremely important in understanding the benefit from biological control. It will be important to also keep good records of all your monitoring activities. These records can be used to predict future out breaks of pests allowing you to match environmental conditions and control methods. In the long run, these records will provide valuable historical data for long-term management.
Identifying Resident Organisms: Accurate monitoring is of little use if you cannot properly identify the organisms living in your landscape. Natural organisms will, at times, control only a specific pest or closely related pests. Poor identification can lead to incorrect conclusions as to pest pressure and natural enemy populations. Using incorrect information on which to base a chemical application can result in a loss of needed beneficial control.

Be sure you can differentiate between harmful pests and beneficial organisms. The inability to accomplish this can lead to a misdiagnosis and loss of valuable natural organisms.

Deciding on Chemical Control: To establish a need for chemical control, threshold levels of pest populations or damage should be established. This level will vary from site to site depending on landscape quality wanted. Threshold levels should follow published pest numbers or based on visual plant damage. Again, the IPM program will require that you tolerate some plant damage. For more information see HGIC 2756, Organic Pesticides & Biopesticides, and HGIC 2770, Less Toxic Insecticides.

Once you have reached your targeted threshold level of pest or damage, prepare for a chemical application. Start by choosing the least toxic chemical available. This could be an insecticidal soap or a horticulture oil spray, or simply using a hard stream of water to wash insects from a plant. Consider stronger chemicals only when these less toxic products fail to give adequate control. Remember, the IPM program states that not every landscape needs to be treated every year for every pest.

Proper Chemical Application: Before applying any pesticide, read, understand and follow all label direction, particularly with respect to environmental hazards and recommended rates. Applying higher rates of chemicals than recommended will not increase effectiveness of that pesticide. It will only aid in polluting the site you are spraying.

Be sure that all application equipment is in working order and calibrated to apply the correct amount of mixture. Also, follow all recommended cleanup and disposal procedures found on the label.

Integrating Chemical & Biological Control
Pesticides are chemicals that control, prevent, repel or mitigate pests or the problems they cause. Applied at the right time, you can temporarily reduce a pest population. Incorrect pesticide usage such as applying the wrong material, using the wrong pesticides rate or applying product by an improper method can cause more harm than good. Using pesticides in a manner inconsistent with the IPM program can cause a secondary pest outbreak, accelerated pesticide resistance and an increase in environmental hazards due to chemical pollution. Always understand the relative toxicity, mode of action, persistence, and safe and legal use of any pesticide you choose to use.

Prepared by Gary Forrester, Extension Agent, Clemson University.
Revised by Joey Williamson, HGIC Extension Agent, Clemson University. (New 05/06.)

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