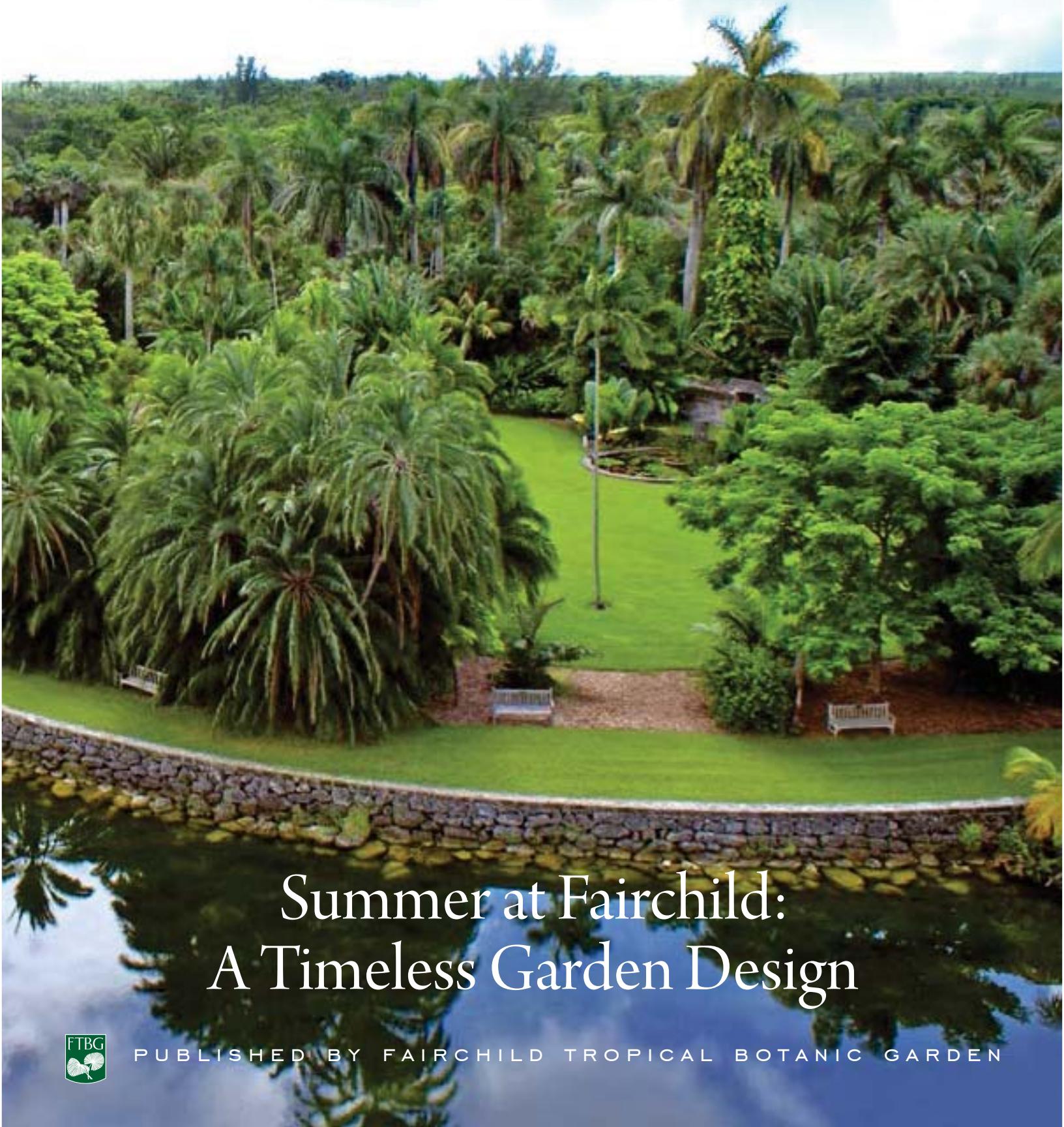


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BUG BEAT

## Integrated Pest Management: Putting bugs to work for us

Text and photo by Kenneth Setzer

Integrated pest management (IPM) is a way of looking at the big picture when it comes to pest control. Rather than taking a "spray and pray" strategy of ridding our plants of harmful bugs or our environment of invasive species, IPM takes into account natural predators and a pest's lifecycle while using a minimum amount of chemical pesticide, if any at all.

IPM has been employed in a range of situations: in agriculture, horticulture, conservation and home gardening. It can utilize fairly complicated strategies involving years of scientific study, or be as simple as cleaning your garden shears or quarantining new plants to avoid spreading fungi or other possible pathogens.

IPM is a simple concept, but, as you can imagine, a large, complex topic. And it is more necessary now than ever before. As global trade has become more prevalent, so too have hitchhikers—in the form of invasive, often destructive, organisms. There are innumerable examples of this, including the emerald ash borer and Asian longhorned beetle. Some harmful organisms have been introduced in other ways, such as the Burmese pythons that

escaped captivity as pets and are currently harming the Everglades ecosystem. At the same time, some natural pathogens—otherwise a normal part of the environment—are running rampant, possibly due to a warming climate.

I'm sure you have heard about the invasive air potato (*Dioscorea bulbifera*). This pest plant has been a bane of the outdoors in the Southeast U.S. for decades. A climbing vine native to tropical Asia and Africa, it has been known to blanket natural areas in the Southern U.S., killing native plants in the process. It was introduced to this country as a possible food source (it requires detoxification) or ornamental, and is noted as having been introduced to Florida in 1905. Plant explorer William Bartram noticed it in a Mobile, Alabama, garden as early as 1777. *D. bulbifera* spreads very quickly, and can re-sprout from underground tubers as well as from the bulbils (tiny secondary tubers) it produces and drops to the ground to create new plants. The bulbils resemble small potatoes—hence the common name.

### A Biological Control for Invasive Air Potato

What to do? Physical removal isn't permanent unless you find and remove all of the subterranean tubers; even something as drastic as burning a field to the ground might not work, because disturbed, cleared areas are especially vulnerable to air potato. Herbicides work, but again leave the underground tubers viable, plus herbicides cause other damage.

In their search for alternative methods of control, scientists looked to the invasive plant's native home—and its native predators. A shiny red beetle was found in Nepal, and later in China, that provided hope. *Lilioceris cheni*, a leaf-eating beetle, was tested over years and found to eat nothing other than *Dioscorea bulbifera* plants; it does not even eat other, related *Dioscorea* invasives, nor does it eat native *Dioscorea* species. Adult beetles even feed on the air potato bulbils.

In 2011, air potato beetles were initially released to Kendall Indian Hammocks Park in Miami-Dade County, and Long Key Natural Area in Broward County. The result has been a decrease in *D. bulbifera* vines and an increase in native plants. The beetles continue to be reared and released as a natural bio-control. So far, so good.

### Biological Controls in Your Yard

You can practice biological controls like this in your own yard. Not only are air potato beetles becoming available to the public, but ladybugs (beetles in the family Coccinellidae) are also readily available for purchase as controls for aphids, scale, psyllids and other plant pests. Green lacewing larvae also consume aphids, mites, thrips, whiteflies and others. Researchers are even using parasitoid wasps to attack pests like the emerald ash borer.

By outsmarting the pests, we can put beneficial bugs to work for us! 

**TOP:** *Lilioceris cheni*, the air potato beetle, decimating the invasive air potato

