



# Cornell University Cooperative Extension Niagara County

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## **THOUGHTS ABOUT RAPID DECLINE & DEATH OF 2-3 NEEDLE PINES**

Submitted by John Farfaglia

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#### **EDITORS**

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We have had several calls in recent weeks from arborists and Cooperative Extension educators who are wondering about the seemingly high incidence of “sudden death” of red, Scots, and Austrian pines – especially in upstate New York, from the Southern Tier to the Lake Plains area. So far as we are aware, there is no new disease or insect pest that is solely responsible for the decline, but there is good evidence that in any given site, several agents are working together to incite the decline.

#### **Soil Moisture**

One major contributing factor seems to be soil moisture; in some sites too much but more often too little. For more than a decade, we have had an inordinate number of weeks in spring and summer of each year where drought stress on plants of all kinds has been rated as severe. Pines can usually hold their own at times like this, but only if they are on good soil...and that is where a second factor comes into play. Red and Scots pines tend to grow best on soil that is sandy and the problem trees of late seem to be on soils that are much heavier. Pines planted in these soils seem to thrive for the first 20 years or so, but as they grow larger, their shallow root systems (made shallow by the apparent inability of the roots to penetrate deeply into heavy clay) become more likely to suffer from drought and their chemical defenses, especially against bark beetles, seem to become less effective. In fact, if they are sufficiently stressed, they may actually send out volatile chemicals that will attract opportunistic beetles.



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### **Diplodia or Sphaeropsis Twig Blight**

With the environmental scales tipped against them, the trees are ripe targets for attack by other pests and pathogens. One well known to landscape plant health care professionals is sometimes known as either Diplodia or Sphaeropsis twig blight. But that name is a misnomer because the pathogen in this case can cause girdling cankers on larger branches or main stems of drought stressed trees. It may be playing a larger role than we're used to on Red and Scots pines in the Northeast.

### **Pinewood Nematode**

Another contributing factor is the pinewood nematode. This pest is spread from tree to tree by the feeding of wood boring beetles, and once it has been introduced into a tree, it can multiply like crazy and move seemingly at will through vertical tracheids and longitudinal ray parenchyma. As it goes, it can block water flow on it's own but it is also accompanied by one or more species of blue stain fungi which have their own capacity to plug conifer cells.

### **Bark Beetles**

Opportunistic insects can also contribute the demise of the trees. A wide array of bark beetles attract 2-3 needle pines in the Northeast, but species in the genus Ips, especially Ips pini are most commonly associated with dying trees. Typically these insects are considered true secondary invaders – attacking trees that are already near death. However, when populations are high because of some untended and infested trees nearby, Ips spp. May play a bigger role in the early stages of decline.

### **Sirex Woodwasp**

Finally – at least for purposes of this discussion – there is a grave concern about the growing spread and impact of the Sirex Woodwasp on pines of all kinds.

This insect was discovered in New York in 2005 and has since been found in 15 counties on or near the shores of Lake Ontario. While surveys to determine just how big a problem this insect may pose to pines in the Northeast are under way, there is considerable fear that the impact could be huge. It certainly has been on North American pines growing in Central and South America.

### **Management**

Of course, the big issues for people in the field revolve around management – of any of these pests individually or of the decline as a whole. The news for now just isn't good. Too often, by the time a problem tree becomes apparent, the damage from several pests is already beyond control. For high value trees, the best option is still to water in times of drought but be particularly sensitive to not overwatering. Free standing puddles in root zone can be just as bad as no water at all. For lower value trees, one is best advised to expect the losses and plan now to rebuild the population with hardier individuals for our climate and soil. Source Branching Out, Volume 14 No. 10

### ***AN ANSWER TO THE MYSTERY OF WANTON QUEEN HONEYBEES: Promiscuity Produces More Productive Colonies***

Submitted by Paul Lehman



Why do queen honeybees mate with dozens of males? Does their extreme promiscuity, perhaps, serve a purpose?

Worker honeybees construct a new comb, an important part of colony founding. Colonies of promiscuous queens tend to be far more successful in such chores and in surviving their first winter than colonies produced by monogamous queens, report Cornell researchers Tom Seeley and Heather Mattila in Science magazine.

An answer to this age-old mystery is proposed in the July 20 issue of Science magazine by Cornell scientists: Promiscuous queens, they suggest, produce genetically diverse colonies that are far more productive and hardy than genetically uniform colonies produced by monogamous queens.

“An intriguing trait of honeybee species worldwide is that each honeybee queen mates with an extraordinarily high number of males,” said Heather R. Mattila, a Cornell postdoctoral fellow in neurobiology and behavior and co-author of the article with Thomas D. Seeley, Cornell professor of neurobiology and behavior.

In every honeybee species, say the researchers, queens mate with multiple males. The European honeybee – the common species in North America – mates with from six to 20 mates on average, for example, while the giant honeybee in Asia has a reported record of 102 mates.

To study the reasons for honeybees' promiscuity, the Cornell biologists inseminated 12 queens with sperm from 15 drones (a different set for each) and nine additional queens with sperm from a single drone (but a different one in each case). They then prompted the hives to swarm in early June to form new colonies.

"After only two weeks of building new nests, the genetically diverse colonies constructed 30 percent more comb, stored 39 percent more food and maintained foraging levels that were 27 to 78 percent higher than genetically uniform colonies," said Mattila.

By the end of the summer, the genetically diverse colonies had five times more bees, eight times more reproductive males and heavier average body weights, mostly because of larger amounts of stored food.

By winter's end, 25 percent of the genetically diverse colonies survived to their one-year anniversary (only about 20 percent of new honeybee colonies make it that long in upstate New York). But all of the genetically uniform hives starved to death.

"These differences are noteworthy considering colonies had similarly sized worker populations when they were first formed," said Mattila. "Undoubtedly, our results reveal enormous benefits of genetic diversity for the productivity of honeybee colonies.

For example, the researchers found that bees in the genetically diverse colonies used sophisticated mechanisms for communication, including waggle dancing, more often than bees in genetically uniform colonies to discover food sources and direct nest mates to food. Because there was more information available among nest mates about food discoveries, the diverse colonies gained far more weight than did genetically uniform colonies. Source: By Susan

Lang, Staff writer for the College of Agriculture & Life Sciences at Cornell

## 10 TIPS TO IMPROVE INDOOR AIR QUALITY

Submitted by Paul Lehman

If you don't use a toxic chemical in the first place, then you don't have to contain it, clean it up, or be exposed to it – which is what preventing pollution is all about. Here is a list of the top 10 things you can do to reduce your exposure to toxic chemicals to create a safer indoor living environment for you and your family.



1. **Household Cleaners** – Look for labels that divulge ALL of the cleaner's chemicals. Be sure to avoid using cleaners that contain these suspect hormone disrupter chemicals: Nonyl- and octyl- phenols are used to make alkylphenol ethoxylate (APE) detergents.
2. **Disinfectants** – Limit the use of disinfecting products in your home. They contain chemical agents that are capable of destroying or inhibiting the growth of microorganisms. Overuse could lead to the growth of "superbugs." The Environmental Protection Agency (EPA) classifies disinfectants and antimicrobials as pesticides.
3. **Lawn Care & Pests** – Children and pets in particular are exposed to pesticides tracked inside homes from lawn treatments. Pesticide exposure also occurs from using off-the-shelf pest repellants. Use organic lawn care methods like mowing high and adding topsoil. To get rid of pests, remove food sources, use boric acid and traps.
4. **Vinyl Floor & Wall Coverings** – Flexible vinyl household products like flooring and wallpaper are manufactured using PVC that may have toxic chemical additives including phthalate plasticizers and lead. As these products are used, they create dusts that accumulate these chemicals. Choose non PVC wall and floor coverings to minimize potential exposure to these toxins.
5. **Building Materials** – Plywood, oriented strand board, kitchen cabinets and home insulation are all products that can contain formaldehyde, a known human cancer-causing chemical.

Choose solid woods and formaldehyde-free insulations when constructing or renovating your home.

6. **Personal Care & Beauty Products**

– Choose products that are fragrance free and reduce your use of nail polish and acetone nail polish remover. If you do use these products, be sure to open your windows.



7. **Dry Cleaning** – Ask your dry cleaner if they offer safer alternatives such as liquid carbon dioxide or “wet cleaning” rather than the commonly used cleaner perchloroethylene, a suspected cancer causing chemical.

8. **Got Moths?** – Eliminate the use of mothballs since they contain naphthalene or paradichlorobenzene. Instead, clean and seal wool clothes, use cedar blocks, shavings or oil.

9. **Mold** – Dry is the operative word. Prevent mold and the overuse of bleach by preventing moisture build up in the first place. Fix leaky pipes and faucets immediately. Make sure that water slopes away from the foundation of your home.

10. **Basement** - Do not leave a car running even with the garage door open especially if the garage is under the living area. Carbon monoxide can easily seep through walls and floors. When your oil company calls during the slow summer months to clean your boiler, don't delay. And test your house for radon.

**Bonus Tip: Avoid Tobacco Smoke** – Ask those who live with you to smoke outdoors. Indoor tobacco smoke is a major contributor to airborne contaminants in the home. Over 4,000 chemical compounds, of which 40 are known or suspected carcinogens, have been identified in tobacco smoke.

This information is provided as a public service from the Massachusetts Toxins use Reduction Institute (TURI) at the University of Massachusetts Lowell [www.turi.org](http://www.turi.org). This resource can be found on our website at <http://envirocancer.cornell.edu/newsletter/article/v12tips.cfm> Source: The Ribbon, Spring 2007

