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# **Purdue Plant & Pest Diagnostic Laboratory**

## 2013 Imprelis® Update: Tree Maintenance, Replacement, and Disposal









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This publication addresses some of the many questions being asked about Imprelis<sup>®</sup> in 2013.

### Background

A DuPont herbicide with the active ingredient aminocyclopyrachlor was sold with the trade name Imprelis® and used in the spring of 2011 to control weeds on many turf areas (lawns, golf courses, sports fields, etc.). Following use of the herbicide, lawn care companies and golf courses across the United States began reporting damage to trees and ornamentals located adjacent to the treated turf areas.

A team of Purdue University faculty and staff worked with industries and clientele and assisted the Office of Indiana State Chemist (OISC) with their investigation of the crisis and the role Imprelis<sup>®</sup> played in injuring trees and shrubs throughout Indiana and the country.

After confirming that Imprelis® was the cause of this damage to trees and ornamentals, OISC issued to DuPont a stop sale, use, or removal order (SSURO) halting the distribution and use of Imprelis® in Indiana to prevent additional tree damage. Following the response in Indiana, the U.S. Environmental Protection Agency (EPA) issued a federal SSURO 10 days later. Imprelis® herbicide is no longer registered by the US EPA for turf.

Turf professionals who reported landscape damage from a 2011 application of Imprelis<sup>®</sup> were encouraged by DuPont to file a claim. Claims were filed and processed with some settlements now reached. New injury to trees and shrubs continued to be reported in 2012 from herbicide applications made more than 12 months earlier. This article provides a 2013 update of this issue and what we hope will be the last and final update on Imprelis<sup>®</sup>. This update addresses some of the frequently asked questions about Imprelis<sup>®</sup> in 2013.

For a complete review of the facts and a more detailed description of the problem, see "A Turf Professionals Guide to Suspected Imprelis® Herbicide Injury in the Landscape" and "Imprelis Update: 2012 Field Notes on Injury and Recovery" available at: http://www.agry.purdue.edu/ turf/ImprelisUpdateLinks.html.

### How Should I Dispose of a Tree Killed/Damaged by Imprelis®?

To properly dispose of Imprelis<sup>®</sup> damaged trees, use trees for lumber or firewood and do not chip them for producing mulch or as an ingredient in compost.

### Can I Use Wood Chips from Imprelis® Damaged Trees as Mulch?

We initiated research at Purdue

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University to determine if a sensitive plant could be injured from wood chips (mulch) obtained from Imprelis®-damaged trees, and to quantify movement of Imprelis® from contaminated wood chips into soil and its subsequent uptake by roots into landscape plant tissues (Patton et al., 2013). We grew tomato plants in June 2012 in the greenhouse and mulched them with chipped tree branches collected from honey locust and Norway spruce damaged in June 2011 by Imprelis®. After 32 days of tomato growth in greenhouse pots



Left: Untreated control tomato plant mulched with wood chips from a healthy tree showing normal development of tomato leaflets.

Right: Treated tomato plant mulched with wood chips from a Imprelis\*-damaged honey locust. Notice the epinasty (bending and twisting) of new growth.



mulched with wood chips from Imprelis<sup>®</sup>-damaged trees, analysis of tissue detected Imprelis<sup>®</sup> in all mulched tomato plants, which was consistent with observations of epinasty on tomato leaflets. Imprelis<sup>®</sup> residues ranged from 0.5 to 8.0 ppb in tomato plants while chipped tree branches contained 1.7 to 14.7 ppb Imprelis<sup>®</sup>. Residues in the potting soil below the mulch ranged from below the quantifiable limit to 0.63 ppb, indicating that Imprelis<sup>®</sup> could leach from wood chips into soil, causing plant injury. These results confirm that trees damaged by Imprelis<sup>®</sup> should not be chipped and used for mulch or as an ingredient in compost.

### Can I Replant a Tree in the Same Place that I Just Removed a Tree Killed by Imprelis®?

Instructions for replanting trees (for those who file claims and for property owners who remove and replace trees on their own, outside of the claims process) are available at <u>www.</u> <u>imprelis-facts.com</u>. Based on soil testing and low levels of Imprelis<sup>®</sup> in treated lawn soils in 2013, Purdue specialists believe it is now safe to plant new trees in the same area where a damaged tree was removed.

"DuPont warrants against any damage to any tree on owner's property (including replacement trees) caused by Imprelis<sup>®</sup> until December 31, 2013, or in the case of replacement trees, until a date two years after the date of planting."

# How Should I Prune an Imprelis® Injured Tree to Promote Recovery?

We recommend pruning off dead, dying branches/tissues on Imprelis<sup>®</sup> damaged trees and shrubs back to the live branch

material. Most of your efforts will be spent pruning back the growing tips since Imprelis® accumulated in the growing points of the plants (tips of branches) due to the systemic nature of the herbicide. It is not out of the question to continue to see damage in other parts of the tree, even after pruning out the damage that has occurred. Typically, herbicides break down much slower once in the plant compared to in the soil. Therefore, there may be small amounts of the



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herbicide in the tissues that appear undamaged and this herbicide can still move within the plant to other tissues.

# How Should I Fertilize an Imprelis<sup>®</sup> Injured Tree to Promote Recovery?

Follow appropriate cultural practices for any tree in decline or under stress such as supplemental irrigation during periods of rainfall deficit and proper mulch applications. It is not a good practice to fertilize any tree under stress conditions. Trees expend additional energy to process the nitrogen, pulling water from the roots, which can worsen health conditions, thus making it more susceptible to further abiotic and/or biotic stress. There is a possibility that fertilization of damaged plants could promote movement of the herbicide within plant tissues. Recommendations are to postpone any nutritional programs until the injury and damage from the

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herbicide has ceased when recovery becomes visible.

#### Did Trees Recover from Imprelis<sup>®</sup> Injury?

Imprelis<sup>®</sup> is continuing to affect the growth and health of Norway spruce, blue spruce and white pine as well as other species. From our observations, Imprelis® is still injuring trees

and symptoms are worsening in most cases and trees are not recovering. Initially, blue spruce appeared largely unaffected by Imprelis® but now injury is visible at some locations. At one blue spruce trees had



location, for example, Blue spruce closeup in 2013 showing injury symptoms.

no Imprelis<sup>®</sup> symptoms in June of 2011, some bud death in spring of 2012, and now these blue spruce appear to be dying



symptoms are worsening from the herbicide based on the continued development of symptoms including gall-like terminal growth on some plants, but we also acknowledge that

Clubbing of new growth on white pine in 2013.

injury was exacerbated by the drought in 2012.

#### Are There Any New Reports of Injury?

In 2013, a few locations are reporting Imprelis® damage to trees and shrubs that were not reported in 2011 or 2012. These cases appear to be old injury symptoms that were unnoticed previously. One example can be seen below where a homeowner moved into the property in 2012 and noticed the damage in 2013 that was not observed by the previous homeowner.

### What Should I Do if I Suspect Imprelis® Injured Trees BUT I Didn't Notice the Damage in 2011 or 2012?

In 2011, OISC investigated more than 400 complaints in Indiana of injury to trees and ornamentals where Imprelis® applications were made. A few new investigations occurred in 2012 based on reports of new symptoms. If you believe your



Top: This photo shows galls that formed top-to-bottom on the leaf tips of a row of arborvitae following a 2012 Imprelis® application to the adjacent lawn. The photos were taken in June of 2013. Inset: Close-up of galls

property was treated with Imprelis® in 2011 and now see what you suspect is Imprelis® damage but you have not filed a claim with DuPont, then contact DuPont at 866-796-4783.

For homeowners who just now discover potential Imprelis® injury, unfortunately, the deadline to file a new claim with DuPont has expired as well as the deadline to file a new claim under the terms of the class action settlement (expired on June 28, 2013). Information about the class action settlement may be found at the settlement website: www.

treedamagesettlement.com. In addition, at this point in time OISC will be unable to offer any significant regulatory relief to damaged consumers, since all possible enforcement remedies have already been exercised.

#### What Is OISC's 2013 Response on this Issue?

In spring 2013, OISC revisited a select group of properties to collect soil samples in order to compare them to previously collected data. Their 2012 sampling confirmed that Imprelis® herbicide was still detectable in the top 6 inches of soil at levels generally less than 1-2 parts per billion. The follow-up testing in 2013 at the same locations showed that Imprelis® was detectable in only half the soils tested and when detected, levels were less than 0.02 parts per billion. Purdue University scientists did some initial testing on the soil collected by OISC to see if tomato plants (highly sensitive to this herbicide) could survive as seedlings when transplanted into this soil. All the plants established and showed no visible signs of epinasty,

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suggesting that this level of Imprelis<sup>®</sup> residue in soils was not high enough to pose a risk towards existing plants in the landscape or newly planted trees and shrubs.

# Where Can I Have Damaged Trees Tested for Imprelis® Residues?

The Montana Department of Agriculture will test for Imprelis<sup>®</sup> residues in soil and plant tissues if you suspect that you have damage and are looking for confirmation. They can test tree branches with small diameters from the terminal branches of trees. The cost is \$250 per plant tissue sample with quantity discounts available. For more information, please visit their website at <u>http://agr.mt.gov/agr/Programs/</u> <u>Commodities/AnalyticalLaboratory/Pesticide/</u>.

# What Language Should I Have in my Imprelis® Settlement Offer?

While we do not offer legal advice we want to emphasize that many partially injured trees may continue to slowly decline from Imprelis<sup>®</sup> injury over the coming months and possibly years. There are few signs of recovery in Imprelis<sup>®</sup> damaged trees. Therefore, a settlement that involves future re-inspection of trees that are "borderline" (meaning they may or may not recover) should be considered.

# Does Imprelis® Pose Future Risk of Ground Water Contamination?

Imprelis<sup>®</sup> has a long soil-residual activity but research on various soil types demonstrates that most of the herbicide stays near the soil surface and, as such, there should be little to no risk of contaminating ground water. Our own data show that this herbicide is detectable in the soil at concentrations 3,000 times less than after its initial application and at levels low enough to no longer harm sensitive plants. Additionally, US EPA ecological risk assessments classify this herbicide as having a low risk to human, non-target terrestrial, and aquatic organisms.

### Where Can I Get More Information?

New information about Imprelis<sup>®</sup> will be posted as it becomes available. A website clearinghouse was created to help you access Imprelis<sup>®</sup> related documents. This document as well as others from the Purdue Plant and Pest Diagnostic Laboratory, Purdue Turfgrass Program, Office of Indiana State Chemist, Environmental Protection Agency, and DuPont can be accessed at: <u>http://www.agry.purdue.edu/turf/</u> ImprelisUpdateLinks.html

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