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Imprelis® Update: 2012 Field Notes on Injury and Recovery

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This publication addresses some of the many questions being asked about Imprelis in 2012, including: did trees recover from Imprelis® injury, are new symptoms being discovered, and how should you care for or replace injured plants.

Background

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

A team of Purdue University specialists in the College of Agriculture responded to the crisis by thoroughly investigating and analyzing the cause of the problem, preparing written information about the problem, and providing recommendations to Indiana homeowners and turf industry professionals. Purdue 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® played in injuring many different tree species in Indiana and the nation.

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). As the name suggests, the SSURO halted the distribution and use of Imprelis® in Indiana, preventing further tree damage. OISC issued the SSURO just 54 days after the first report of injury in Indiana. Following the response in Indiana, the U.S. Environmental Protection Agency issued a federal SSURO 10 days later. Imprelis® can no longer be sold or used in the United States.

Turf professionals who reported landscape damage from a 2011 application of Imprelis® were encouraged by DuPont to file a claim in 2011. Claims were filed and processed in 2011. Although some settlements have now been reached, many are still being processed and DuPont representatives are visiting selected affected properties to assess the damage and recovery of trees and shrubs.

For a complete review of the facts and a more detailed description of the problem, turf professionals are encouraged to review "A Turf

Professionals Guide to Suspected Imprelis® Herbicide Injury in the Landscape" available at: http://www.ppdl.purdue.edu/PPDL/pubs/briefs/ImprelisLCO.pdf.

The rest of this update addresses some of the many questions being asked about Imprelis® in 2012, including:

- Did trees recover from Imprelis® injury?
- Are new symptoms being discovered?
- How should you care for or replace injured plants?

Did Trees Recover from Imprelis® Injury?

In the locations that Purdue and OISC specialists visited, most of the trees that were identified and confirmed as damaged by Imprelis® in 2011 declined in health throughout the 2011 growing season — and they are not recovering in 2012. Some trees exhibit symptoms exactly like they did the previous year. They appear frozen in time, and no new growth has occurred. Some trees show signs of new growth from axillary buds but not from terminal/apical buds. In many cases, despite some recovery, trees are too damaged, so removing them is still recommended. Other trees with little injury may still recover but will likely require corrective pruning to maintain desirable form and symmetry.

Injury Increased

These photos show examples of plants that have shown more injury symptoms since first being identified in 2011.

Left: This photo was taken in June 2011 at the first property inspected by OISC. Notice the level of injury to this Norway spruce and compare to the photo below where this tree died.

Right: In this photo taken in May 2012 the Norway spruce on the far right is the same tree shown above. Notice that the more tolerant white pine in the background survived.

Left: This photo was taken in August 2011. The three Norway spruces on the right show varying levels of injury. The third from the right shows the most injury, while the other two show only injury to the tops.

Right: This photo was taken in May 2012. The same three spruce trees nine months later look similar. The two Norway spruces on the right have more injury than could be seen in 2011.

Left: This photo was taken in August 2011 of three honey locust trees affected by Imprelis®. Symptoms included yellow leaves with some leaves fallen.

Right: This photo was taken in May 2012. Very few leaves were present, and new leaves continue to show signs of growth regulator damage. In effect, all three honey locust trees are dead.

Injury Stayed the Same

These photos show examples of plants that have shown no changes in injury symptoms since first being identified in 2011.

Left: This photo of a damaged white pine was taken in June 2011.

Right: In May 2012, the leaf tips on many white pines looked very similar to the way they looked the previous year with no sign of new growth from the growing tips.

Some Signs of Recovery?

These photos show examples of plants that may be showing signs of recovering from injuries first identified in 2011.

Left: This Norway spruce is showing signs of new growth from axillary buds not from the apical/terminal buds (growing tips). However, this tree is too damaged and removal is still recommended.

Right: This Norway spruce may still recover completely or will likely require minor corrective pruning to maintain desirable form and symmetry.

Are New Symptoms Being Discovered?

In 2012, a few locations are reporting damage to trees and shrubs that were not reported in 2011. We cannot be exactly sure whether these are new symptoms or whether they went unnoticed in 2011. However, we are certain that symptoms are still being observed in species such as cottonwood, lilac, Norway spruce, white pine, and yellow cypress, and it appears that these are new symptoms in 2012 on plants that did not show symptoms in 2011. Laboratory tests are ongoing to confirm that spring 2011 Imprelis® applications are the cause of injury to these trees and shrubs in 2012.

Left: This photo shows cupping observed on lilac in May 2012 in northern Indiana. This is a characteristic symptom of growth regulator herbicide injury such as caused by Imprelis®.

Right: This photo shows strapping symptoms observed on lilac in May 2012 in central Indiana. This is a characteristic symptom of growth regulator herbicide injury such as caused by Imprelis®.

Left: This photo shows a Norway spruce in May 2012 with new symptoms. The damage appears very similar to Imprelis® injury symptoms observed on other Norway spruce in 2011.

Right: This photo shows epinasty observed on white pine needles in May 2012. The damage appears very similar to Imprelis® injury symptoms observed on other white pine in 2011.

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

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 are ongoing in 2012 based on reports of new symptoms. If you applied Imprelis® in 2011, did not file a claim in 2011 with DuPont, and now see what you suspect is Imprelis® damage, then contact OISC at (765) 494-1492. OISC will investigate these reports on a case-by-case basis.

If you applied Imprelis® in 2011, filed a claim in 2011 with DuPont, and now see what you suspect is new damage from Imprelis® on previously undocumented trees, then contact DuPont at (866) 796-4783. Request a site visit and the forms you'll need to file an amendment to your claim.

What Is OISC's 2012 Response on this Issue?

In spring 2012, OISC visited more than two dozen random properties that had trees damaged by Imprelis® in 2011. At each site they sampled leaf tissues and soil samples and collected visual observations and photos of damaged trees. Their 2012 sampling has confirmed that Imprelis® herbicide is still detectable in tree branch tips of both dead trees and plant leaf tissues of damaged trees. It also is detectable in the top 6 inches of soil at levels generally less than 2 parts per billion. A summary of this data is available at http://www.isco.purdue.edu.

Although the amount of Imprelis® present in the soil decreased by an average of about 97 percent from June 2011 to May 2012, it is unclear whether the levels in the soil are high enough to cause new damage or if the herbicide injury observed in plants in 2012 was from herbicide uptake in 2011. OISC will continue to monitor properties and provide updates as needed.

Can I Do Anything to Help Trees Recover?

Trees that were injured from Imprelis® but not killed should be managed by watering them during dry periods to reduce drought stress and provide sufficient moisture for new growth. Avoid overwatering, which can cause water-logged soils and contribute to root decay. The effects of fertilization on trees injured by Imprelis® is not known, so we are hesitant to recommend fertilization to promote recovery. Pruning is recommended to remove dead and severely damaged branches — this may help reduce the possiblility of infestation by secondary diseases and insects.

How and When Should I Replace Damaged Trees?

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 www.imprelis-facts.com. Based on soil testing and the continued presence of Imprelis® in treated lawn soils, For 2012, Purdue specialists do not recommend planting new trees in the same area where a damaged tree was removed — unless the entire tree is removed (shoots, roots, bark, leaves, etc.) and several cubic feet of soil surrounding the tree are also removed. Soil removal will be necessary to protect newly planted trees from being exposed to the herbicide. Although replanting a tree in an Imprelis®- treated area could be risky in 2012, those who filed a claim should be protected from this risk according to DuPont which states on their website (www.imprelis-facts.com):

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

What Do We Know Now that We Didn't Then?

We know much more in 2012 about Imprelis® than we did in 2011, but there is still much more that we don't know — like exactly how long this herbicide will persist in the soil and why some tree and shrub species were affected so quickly and others are just now showing symptoms. Current research at Purdue and other universities around the country are trying to answer the many questions people still have. We will keep you informed as we learn more.

What Is Taking DuPont So Long?

Many people have been asking this question. Turf professionals are getting pressure from their clients and, in some cases, their insurance companies. Unfortunately, we are not sure why the claims process is taking so long for so many people other than the fact that many claims were filed, each with several trees, and large amounts of paperwork are required in this legal process. Although some settlement offers have been made, most are still waiting to hear back from DuPont. All we can do is encourage you to contact DuPont and express your concerns regarding the process.

Where Can I Get More Information?

New information about the degree and extent of this problem will be posted as it becomes available for interested parties at the following locations:

- Purdue Plant and Pest Diagnostic Laboratory, http://www.ppdl.purdue.edu
- Purdue Turfgrass Program website, http://www.agry.purdue.edu/turf and blog, http:// purdueturftips.blogspot.com
- Office of Indiana State Chemist, http://www.isco.purdue.edu
- DuPont, http://www.imprelis-facts.com

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