

## Purdue Plant & Pest Diagnostic Laboratory

# A Turf Professional's Guide to Imprelis® Herbicide Injury in the Landscape



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A portion of this guide was adapted with permission from a document by Bert Cregg, PhD and Kevin Frank, PhD, Michigan State University.

Many Indiana turf professionals who used the herbicide Imprelis® in the fall of 2010 or spring of 2011 have reported off-target damage to trees and ornamentals in the landscape where applications were made. Below are answers to frequently asked questions about Imprelis® and its use, injury symptoms and overall plant responses that have been observed, recommendations on how to respond to customer inquiries, and information on how turf professions should deal with the issues of plant damage and handling of any Imprelis® product in their possession.

### What is Imprelis®?

Imprelis® (aminocyclopyrachlor) is a selective auxinic herbicide for selective control of troublesome broadleaf weeds in turf. Imprelis® was first sold in October 2010 for use only by turf professionals.

### Why was Imprelis® used by so many turf professionals?

Imprelis® was developed and marketed to provide control of several difficult to control turf weeds including ground ivy (creeping Charlie) and wild violet. Imprelis® was labeled for use at rates of 3.0 to 4.5 fluid ounces per acre ( $\leq 0.07$  lbs a.e./acre). These characteristics and its low

toxicity to mammals made it a desirable choice for turf professionals.

### How does Imprelis® work?

The herbicide has both foliar and soil activity and is absorbed by the target plant's leaves, stems, and roots. Since Imprelis® remains active in the soil, it can provide residual control of weeds.

### What type of injury symptoms have been observed on landscape plants after Imprelis® applications?

Although Imprelis® was registered for control of broadleaf weeds in turf, some homeowners, lawn care operators, and golf course superintendents started observing injury on trees and some ornamentals in their landscapes this spring (late May and early June) in the turf areas where it had been applied last fall or this spring. Symptoms observed



Photo 1. Twisting of white pine growing tips

include dieback; brown and twisted shoots, leaves and needles; especially near tree tops (photos 1-3) and were most severe on the current year's growth — the outermost or topmost growth (photo 4). Unlike conifer insect and disease problems, Imprelis® injury occurs rapidly — usually within two to four weeks of application. The most commonly affected trees to date have been Norway spruce, Colorado blue spruce, and eastern white pine; however, firs, yews, arborvitae and some deciduous trees and shrubs have also been affected (photo 5).



Photo 2. Brown needles on a Norway spruce

### Is damage a result of a misapplication?

Investigations by the Office of Indiana State Chemist (OISC) have found that damage observed is not from misapplications as the herbicide was applied to lawns per label instructions. After tree damage was reported, DuPont issued a statement on June 17, 2011, that cautioned applicators: “do not apply Imprelis where Norway spruce or white pine are present on, or in close proximity to, the property to be treated.” However, the original product label did not specify this caution to applicators.

### Why is a lawn herbicide killing trees?

We are still trying to learn more about why this injury happened. It appears that Imprelis®, which can move downward in the soil once applied to the turf, was able to reach the shallow root system of some tree species causing injury. Not all lawn herbicides are mobile in the



Photo 3. Injury is most severe on the outermost or topmost growth.

soil and this is the first report of a selective auxin herbicide designed to control broadleaf weeds in turf causing such extensive of damage to trees and ornamentals.

### How widespread is the problem?

To date, university Extension services in 22 states from Kansas to Pennsylvania have reported injury to conifers associated with Imprelis® application to turf and lawns. Although damage is widespread, injury to trees is inconsistent (photo 6) as some trees are damaged more than others and researchers are still trying to learn more.

### Will trees recover from Imprelis® injury?

Based on experience with synthetic auxinic herbicide injury and other types of environmental damage, trees that have minor browning (less than 1/3 of crown affected) on new growth will likely recover. However, recovery may be slow and occur over one or two growing seasons. Trees with distorted top growth may resume growth, but will likely require corrective pruning to maintain desirable form and symmetry. Severely distorted and damaged trees and those with extensive death of new

growing tips may die. Norway spruce appears to be the most susceptible species. Initial observations on trees with extensive injury suggest that many Norway spruce may die as a result of herbicide exposure, while other species may recover depending on how extensive the injury is.



Photo 4. Injury on some deciduous trees has been reported.

### Can anything be done to help trees recover?

The trees that appear to be most sensitive to and commonly affected by Imprelis® injury typically have a vigorous growth habit, which makes them good candidates to recover from minor injury. If you suspect trees are injured from Imprelis®, reduce drought stress by watering them during dry periods. Avoid overwatering, which



Photo 5. Injury among adjacent trees is inconsistent at many locations.

causes water-logging. Fertilizing affected trees and shrubs during 2011 is not recommended, but fertilization of the turf in the fall of 2011 is recommended per normal turf fertilizer recommendations. When damaged trees and shrubs are surrounded by turf, take care to fertilize outside the drip line of damaged trees so not to stimulate new growth of the trees.

### **Why does the type of injury vary so much?**

Imprelis® injury to trees and ornamentals is most severe in the current-year's growth. That means the greatest degree of injury can be seen in young trees and on the new growth of vigorous older trees, (photo 6). Trees growing in landscape beds or other buffers typically show less damage than trees that are completely surrounded by turf.

### **What should I do if I suspect Imprelis® has caused injury to trees on a property I maintain?**

The OISC has investigated approximately 400 complaints in Indiana in 2011 of injury to trees and ornamentals where an Imprelis® application was made. No new investigations are planned unless injury to new ornamental species are reported.

Additionally, applicators are encouraged to file a claim with DuPont, following all of their prescribed procedures, to protect themselves. To file a claim with DuPont, call (866) 796-4783 and request a site detail form and ask for a complaint number. The deadline for submission of claims is November 30, 2011. If you have not already started this claim/resolution process, it would be prudent to begin this process immediately. A complete record of when symptoms began and how quickly they progressed is important since herbicide injury to trees and ornamentals can progress rapidly, especially in the summer heat, and without records, a firm diagnosis is much more difficult.

To help document injuries, the lawn care operator (LCO) or client should collect and organize herbicide application records regarding these locations and photograph symptoms and changes in symptoms over time with a digital camera. DuPont has posted information on "Photography Instructions Before Removing Trees" at <http://www.imprelis-facts.com/> for more instructions on how to properly collect these

photos including an identifying photo showing the property, a full tree photo, a photo of the terminal growing point (top of tree), and 2-3 photos of the general injury symptoms of the tree (close-ups). It is important to identify all trees that you believe are showing impact as a part of this claims process, so they can be appropriately documented.

If you have questions or require more information on this issue, see the website links below or contact the OISC pesticide section at (765) 494-1492.

### **What is the response of the OISC on this issue?**

The OISC has issued a series of news releases and updates that address the continuing developments regarding Imprelis® (read news releases at [www.isco.purdue.edu](http://www.isco.purdue.edu)).

The OISC issued a stop sale, use, or removal order (SSURO) on August 1, 2011 for the herbicide Imprelis®. The OISC has reason to believe that DuPont Imprelis® Herbicide, EPA Reg. #352-793, when used as directed or in accordance with commonly recognized practice, has caused injury to non-target vegetation, except weeds to which it has been applied, and is therefore MISBRANDED. Therefore, the OISC is hereby issuing a STOP SALE, USE OR REMOVAL ORDER (SSURO) to DuPont Professional Products. This SSURO requires DuPont Professional Products to cease all sale, distribution and use of DuPont Imprelis® Herbicide, EPA Reg. #352-793, in the State of Indiana, effective immediately. This SSURO pertains to any and all quantities and sizes of DuPont Imprelis® Herbicide, EPA Reg. #352-793, within the ownership, control or custody of DuPont Professional Products wherever located. In addition, DuPont Professional Products shall not commence any movement of this product from any present location without prior written approval from the OISC. Any person violating the terms or provisions of this SSURO shall be subject to civil or criminal penalties as set forth in IC 15-16-4.

The OISC is prepared to revise this SSURO as needed to allow for the product recall described below.

### **What does the US EPA say about Imprelis®?**

On August 11, The EPA issued a SSURO for the herbicide Imprelis®. Previously, the EPA issued a letter to

DuPont on August 3, 2011 stating two concerns. First, that the EPA is considering issuing an SSURO (described above). Second, the EPA is concerned about the lack of information that is being provided by DuPont to the public concerning the efficacy of Imprelis®. The EPA “strongly encourages DuPont to reconsider” providing information related to the phytotoxicity studies related to effects on trees. More information about Imprelis, including EPA registration of the herbicide, is available at: <http://www.epa.gov/pesticides/regulating/imprelis.html>.

### **What action has DuPont taken to address customer complaints?**

DuPont is implementing a voluntary suspension of sale of Imprelis® herbicide and they initiated a return and refund program in October 2011. DuPont has also notified lawn care professionals and golf course superintendents of a new claims process. The claims process includes the following:

- Removal and disposal: DuPont will compensate you for removal and disposal of impacted evergreen trees which are unlikely to recover, or DuPont will provide this service for you through our contracted partners.
- Replacement or compensation: DuPont will compensate you for replacing evergreen trees that are unlikely to recover or DuPont will directly pay property owners if they choose not to replace these trees.
- Replacement tree care: To support the long-term health of replacement trees, DuPont will pay for care programs after replanting.
- Warranty: DuPont will provide a two-year warranty to program participants for all replacement trees. Should Imprelis® cause any impact to other trees on your customers' properties during the next two years this warranty will cover those trees as well.
- Maintenance of other impacted trees: DuPont will pay for efforts to assist the recovery of other trees impacted by Imprelis® use. If the tree does not recover satisfactorily by June 2012, then DuPont will pay to replace the tree or provide additional care.
- Additional compensation to property owners: To cover costs, inconveniences and other possible impacts associated with Imprelis®, DuPont will

provide participating property owners an additional direct payment based on a fixed percentage of the total validated claim.

Additional information including the details of the compensation process was sent to turf professionals directly if they had previously contacted DuPont. If you have not received this information, more information is available at <http://www.imprelis-facts.com/> and at (866) 796-4783. The deadline for submission of claims is November 30, 2011.

### **How will property owners be compensated by DuPont?**

Compensation will include tree removal and disposal, tree replacement or compensation, replacement tree care, tree warranty, maintenance of other impacted trees, and additional compensation to property owners and golf courses. More information about compensation will be supplied directly by DuPont as part of the claims process. DuPont will value trees and services on a case-by-case basis. More information about the claims process, including a FAQ document is available at <http://www.imprelis-facts.com/>.

### **Can I still apply Imprelis® herbicide in Indiana?**

No. The SSURO issued by OISC does not allow the continued use of existing Imprelis® herbicide.

### **What do I do if I have leftover Imprelis® herbicide?**

DuPont initiated a product return and refund program in October 2011. DuPont has contacted distributors, who will be coordinating with turf professionals to ensure that all remaining full and partially full bottles of Imprelis® are returned. Turf professionals have 10 business days to return all Imprelis® product (4.5 fl. oz., 1.0 gallon, and 2.5 gallon bottles) to them after the initial contact from the distributor. After you return your remaining Imprelis® to your distributor, turf professionals will be given either a refund or credits, depending on the distributor's policy. In this EPA approved disposition plan, the EPA suggests that you maintain records associated with Imprelis®, including but not limited to: 1) quantities used and returned, including product lot numbers 2) application records, and 3) purchase records.

## What do I do with damaged trees on the properties I manage?

Before removing any tree, make sure you have filed the appropriate paperwork with DuPont (described above) and have documented the damage with digital images. DuPont has contracted arborists to help with the tree removal process. If you need assistance removing trees, call (866) 796-4783. Do not chip affected trees and use as wood mulch to prevent these wood chips from being used in landscapes as these wood chips may still contain herbicide residues.

## How do I replace trees that are damaged?

Instructions for replanting trees for both those who file claims and those property owners who remove and replace trees on their own, outside of the claims process, are available at <http://www.imprelis-facts.com>.

## What kind of information is available to give to homeowners with injured trees?

Purdue faculty and staff have developed a publication that answers the commonly asked questions from homeowners about Imprelis®. The publication is available at <http://www.ppd.purdue.edu/ppdl/pubs/briefs/ImprelisFAQ.pdf>. We are encouraging homeowners to continue to work with and seek information from their lawn care professionals. Additionally, information about other tree and shrub maladies (stress, diseases, and insect damage) is available from the Plant and Pest Diagnostic Laboratory website: <http://www.ppd.purdue.edu/>.

## 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:

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