The Plant Doctor's LANDSCAPE TIPS

By David L. Roberts, Ph.D, *Michigan State University*

IMPRELIS HERBICIDE DAMAGE TO LANDSCAPE PLANTS

INTRODUCTION:

There have been numerous complaints from many states about IMPRELIS (herein written as Imprelis) herbicide damage to landscape plants. Generally, the most commonly voiced concerns are those involving conifer plants, especially Norway spruce and white pine. I personally have received complaints from many plant health care providers and have observed presumed Imprelis damage on a wide range of plants (see photos).

What is Imprelis?

Imprelis (aminocyclopyrachlor) is a relatively new herbicide released by DuPont Professional Products in 2010. Its primary targets are broad leaf weeds in turfgrasses, which may include lawns, golf courses, athletic fields, cemeteries and sod farms. As one turf manager put it, "Imprelis is the new silver bullet for lawn weed control". Indeed, Imprelis is designed for outstanding weed control in turf situations; purportedly, some turf managers are attracted to some claims that only one application is necessary to provide season long control. Whatever the case, Imprelis appears to be a fairly potent and persistent herbicide.

Imprelis herbicide belongs to a group of chemicals known as pyrimidine carboxylic acids, similar to but not identical to the pyridine carboxylic acids such as triclopyr (Turflon and Garlon), aminopyralid (Milestone), fluroxypyr (Spotlight) and picloram (Grazon and Tordon). It is designed to compete with the "dandelion control" standards, 2,4-D, 2,4-DP, dicamba, clopyralid, mecoprop, etc.. In extensive trials, Imprelis is reported to have shown impressive management of dandelion, wild violet, clover, Creeping Charlie (ground ivy) and plantain.

Among many statements on Dupont's label for Imprelis, the following statements are very important for the Imprelis issue now apparently affecting many landscapes (there are other important statements mentioning water resources and runoff but not mentioned here).

* On cool season turfgrasses…, when applications will not be made within five feet of ornamental groundcovers, foliage plants, flowers, trees, shrubs or other desirable plants, Imprelis herbicide may be applied at six fluid ounces of product per acre.
* Do not apply this product to exposed roots of trees and shrubs.
* Do not apply to any ornamental bed.
* Do not apply this product directly to, or allow spray drift to come in contact with, ornamental groundcovers, foliage plants, flowers, trees, shrubs….; or to the soil where potentially sensitive plants will be planted the same season.
* Do not exceed specified label rates for any area and particular care must be taken within the drip line of trees and shrubs or other ornamental plants.
* Do not apply where runoff or irrigation water may flow onto susceptible turfgrass, ornamental plants or crops as injury may result.
* Do not use grass clippings from treated areas for mulching or compost, or allow for collection to composting facilities……

In my estimation, the label needs to be clarified; I expect some modifications to the label will be forthcoming from Dupont. For example, the statement "Do not apply this product to exposed roots of trees and shrubs" suggests that the product may be applied to lawn areas where roots of trees and shrubs are not be exposed. There is ample evidence that the herbicide is leaching into submerged roots systems of trees and shrubs. Also, the statement "…when applications will not be made within five feet of ornamental groundcovers, foliage plants, flowers, trees, shrubs…" is confusing; does that imply five feet from

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Photo 1: Imprelis damage on Norway Spruce (Landscape photo credit, Elliott Schaffer).

Photo 2: Imprelis damage on Austrian Pine. All shoots tips on this young pine were brittle and necrotic; hence, the tree will likely die. There was no evidence of Diplodia tip blight or shoot borer on this plant. Many other plants in this landscape were also affected.

Photo 3: Imprelis damage on Taxus. No serious black vine weevil or other insects or diseases were found on these plants.

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Photo 4: Imprelis damage on Larch; there was no evidence of larch casebearer insect, which may produce similar symptoms.

Photo 5: Imprelis damage on Honeylocust, which may be confused with injury from honeylocust plant bugs and leafhoppers. Other honeylocust trees in this corporate landscape site, surrounded by lawn, appeared to have been killed by the herbicide.

Photo 6: Imprelis damage on Redbud. Injury is light to modest and the plant is likely to survive. Another Redbud approximately 30 feet away, but not adjacent to this lawn area where Imprelis was applied, showed no symptoms.

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the trunk or five feet from the drip line? Regardless, we know that roots of trees may extend well beyond five feet from the drip line.

As a growth regulator herbicide, Imprelis, like other broadleaf weed herbicides, has the capability to adversely affect many broadleaf plants. For these types of herbicides, a large tree or valuable shrub is nothing but another dandelion.

SYMPTOMS OF IMPRELIS HERBICIDE DAMAGE ON LANDSCAPE PLANTS:

As a growth regulator type herbicide, Imprelis causes growth regulator type symptoms on plants including petiole twisting and bending, curling and cupping of leaves, yellowing of foliage, browning and possible dropping of conifer needles and leaf/shoot effects on deciduous plants (Photos 1-8*) . Plants may absorb Imprelis through leaves, stems and roots. Once in a plant, the chemical is translocated in the xylem and phloem where it accumulates in the meristematic regions of the shoots and roots. As such, shoots may also be visibly impacted, particularly during the spring when meristematic tissues are quite active.

Symptoms may range from "mild to wild". Plants with slight exposure to Imprelis may exhibit only mild cupping and leaf distortion. Moderated exposures may kill the extreme portions of shoots of plants, but lateral buds may expand for plant recovery with time. In some situations, Imprelis exposure may be lethal to plants.

Herbicides such as Imprelis may affect non-target plants by drift or by root uptake. For example, symptoms on lower branches of trees are more consistent with drift of the herbicide while symptoms over the entire tree or shrub or on certain sections of the tree or shrub are often more consistent with root uptake. Many of the symptoms I have witnessed where Imprelis is presumed to be the culprit appear to be via root uptake. Possibly, the abundant spring rains and other weather factors have contributed to the problem during the spring and early summer of 2011.

We must use caution so that Imprelis does not unfairly receive blame for every malady in the landscape (Photos 9 and 10).

MANAGING IMPRELIS HERBICIDE DAMAGE:

Managing Imprelis Herbicide Damage: Apparently there is no antidote to reverse Imprelis injury once exposure has occurred; we must simply allow nature to take its course. In my observations, some plants exhibit serious lethal effects from supposed Imprelis exposure while other plants exhibit slight symptom development. Other plants exhibit what appears to be serious effects from Imprelis but at the time of this writing, are starting to flush new growth from secondary buds; many of these plants may recover with time….or they may continue to take up Imprelis. Other plants may be weakened sufficiently to succumb to winter injury or other problems. I recommend not making snap decisions but assume the wait and see approach. There is the potential for plants to continue to take up the herbicide for several weeks. Obviously, some plants may need to be watched for several months or into 2012.

For future applications, be sure to follow label directions and exercise extreme caution (more caution than the current Imprelis label suggests) in the vicinity of desirable landscape plants.

TIPS FOR DIAGNOSING HERBICIDE DAMAGE ON LANDSCAPE PLANTS:

1) Ensure that an herbicide was applied and what class of herbicide was applied. In some instances, admissions of herbicide usage may not be forthcoming. Records can be checked or investigated by state authorities.
2) Ensure that the symptoms observed on plants are consistent with the class of herbicide applied: ex. leaf twisting and cupping for growth regulator herbicides (2,4-D, dicamba, Imprelis); shoot tip yellowing, whitening and dieback with amino acid inhibitor herbicides (glyphosate=Roundup); leaf spotting with contact herbicides (paraquat, diquat), etc.
3) Eliminate other causes such as insects/arthropods, diseases, environmental and cultural factors.
4) Observe patterns of damage in relation to the most likely application area: drift or root uptake?
5) Examine other non-target but susceptible plants in the vicinity of the affected plant(s).
6) Compare affected plants with the same or similar species of plants in nearby areas not known to have been treated with an herbicide.
7) Perform an analytical residue analysis if possible. These tests can provide a back-up confirmation that a particular herbicide was applied. To my knowledge at the time of this writing, there are no labs that can test for Imprelis residues.
8) Obtain professional help not only for other opinions and experience but for additional documentation for potential claims.

* Note: All plants in this article's photos, unless otherwise noted, exhibit typical symptoms of Imprelis herbicide damage or what are presumed to be Imprelis damage. Generally, where Imprelis injury has occurred, at least several different species of plants in the same landscape have been affected. The above "Tips for Diagnosing Herbicide Damage on Landscape Plants" were followed, and other problems were eliminated as causal factors.

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health-care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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Photo 7: Imprelis injury on weeping mulberry. Note leaf cupping and distortion typical of growth regulator type herbicides (Inset).

Photo 8: Imprelis injury on linden. All the foliage (inset) on this Sterling Silver linden tree exhibited herbicide injury, probably indicating root uptake. I suspect the tree will survive.

Photo 9: It is important not to confuse Imprelis herbicide injury with insects, diseases, cultural and environmental issues. Even though these dead pine tips might appear similar to Imprelis damage, the actual cause is Diplodia tip blight, a fungal disease.

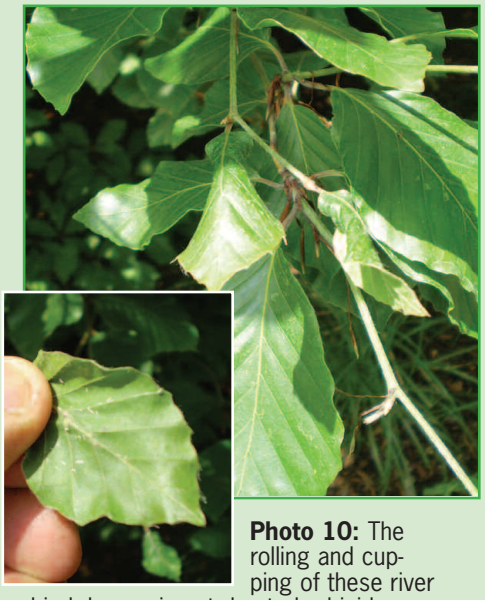

Photo 10: The rolling and cupping of these river birch leaves is not due to herbicide. Unfurling the leaves revealed an infestation of aphids (Inset).