



The Plant Doctor's LANDSCAPE TIPS

By Dr. David L. Roberts, The Plant Doctor LLC a.k.a. The Tree Doctor

PRODOXABEN G PHYTOTOXICITY TO LANDSCAPE PLANTS

INTRODUCTION

A healthy and aesthetically pleasing landscape depends on a variety of inputs from our industry (Photo 1). Some of these inputs include proper landscape design and installation, nutrition (fertilizer), moisture (irrigation, precipitation), weed management, pruning, etc.

For weed management, we adopt certain practices such as physical removal and herbicides, whether organic or traditional. Herbicides may be categorized as Pre- and Post-Emergent. As the name implies, a Pre-Emergent herbicide kills weeds (or any desirable plant) when its seed germinates and is exposed to the lethal herbicide. Pre-emergent herbicides generally "do not affect" plants that have been established (at least we hope), while post-emergent herbicides may, depending on its mode of action. There are quite a few herbicides that can be classified as "pre-emergent". One very commonly used pre-emergent herbicide is Trifluralin, the active ingredient of Preen, Treflan and other products.

This summer, I was contacted by Kathy who has an important management position in a reputable landscape company, catering to customers who expect extraordinary results (Photo 1). Kathy expressed her frustration with poor performance of a variety of "sick" landscape plants at several of her accounts. She wanted help in resolving the problems with the landscapes she manages. It seems that her company had ordered a batch of Preen from her supplier, but the supplier, who was out of Preen, had a good supply of Prodoxaben G, which was presented to Kathy's company as the "same as Preen". I think Kathy already had a good idea about the cause of the problems with her landscape plants; she had done her homework. But she called me for backup to ensure other factors such as diseases, pests, environment, etc. were not involved.

I do not want to present myself as an "Herbicide Specialist", per sé. But many members in this fine industry of ours know from my articles, research, and programs that I have done testing of herbicides, especially, for example, in regards to Oak Wilt management as well as in other areas. Plus, and perhaps most importantly, I have been diagnosing herbicide injury to trees and other landscape plants for more than four decades . . . distinguishing chemical (herbicide) injury from other incitants of plant problems such as pests, diseases, cultural and environmental issues.

WHAT IS PRODOXABEN G?

Prodoxaben G is a granular product that contains 0.40% Prodiamine and 0.25% Isoxaben, both of which exhibit pre-emergent activity. These chemicals are used widely across many target applications and sold under various trade names. According to the label, Prodoxaben can be applied to turfgrasses, lawns, ornamental gardens, landscapes, hardwood nurseries, fence rows, Christmas tree farms and many other uses.

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Photo 1

Photo 1: Nice landscapes require maintenance inputs including pest and disease management, nutrition, irrigation, and weed control. Pre-emergent and post-emergent herbicides offer viable options for efficient weed management in lieu of labor-intensive physical removal.



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Targeted weeds are wide-ranging: barnyard grass, wooly cup grass, chickweed, henbit, switchgrass, pigweed, witchgrass, and knotweed, among numerous others. Pre-emergent herbicides kill "weeds" by preventing germination of seeds or by attacking seeds as they are germinating.

WARNING: Prodoxaben G is described as a "selective" pre-emergent herbicide. However, "selective" is a relative term that is somewhat nebulous given the wide range of "weeds" (and other plants) affected by this and other herbicides. We must remember that a weed is defined as an unwanted plant in a specific location. The same plant may be desired in another location and, hence, in some situations, may not be considered a weed. While pre-emergent herbicides will hopefully only attack weeds, they often do not distinguish between weed seeds and desirable plant seeds. For example, if we are trying to establish a prairie by seeding native plants and/or wildflowers where pre-emergent herbicides have been applied, it is likely the pre-emergent herbicide will affect the germination and establishment of traditional prairie plants as well as "weeds". Furthermore, we hope pre-emergent herbicides will only impact germinating seeds and not established plants. Unfortunately, pre-emergent herbicides may occasionally affect desirable plants in the landscape or wherever they are applied.

In regard to Prodoxaben G, an important aspect about the label that Kathy discovered was that the product should not be applied to Hydrangeas, Rhododendrons and other plants, especially in new plantings. Shouldn't Kathy's vendor have warned her about these restrictions?

SYMPTOMS AND PLANTS AFFECTED BY PRODOXABEN

While visiting several of Kathy's accounts, we noticed a variety of symptoms apparently caused by Prodoxaben on landscape plants. These symptoms ranged from mild to wild (death): growth distortions, dieback, wilting, mosaic/mottling, stunting, suppression of flowers, sparse foliage, defoliation, leaf burn, death, among other disagreeable impacts (Photos 2-7B). We should also consider that just because we do not see obvious symptoms of herbicide phytotoxicity (=plant toxicity) it should not be construed that herbicides (or other chemicals) are not having an adverse impact on the health of our plants. For example, the lack of thriftiness may just be one result of herbicidal side effects.

While visiting several sites where Prodoxaben G was applied, and while eliminating other potential causes of "plant disease" (in the broad sense), Kathy and I noted that the following plants were affected by the herbicide: Hydrangea, Viburnum, Rose, Dogwood, Fern, Lilac, Rudbeckia, Serviceberry, Azalea, Rhododendron, Geranium (maculatum), Amsonia, Nepeta (Catnip), Echinacea, Astilbe, Heuchera, Fothergilla, and Aster. Plants that did not seem to be affected by the herbicide include: Alchemilla mollis, Boxwood, Larch, Pine, Hypericum, Iris siberica, grasses, Deutzia, Hibiscus, Baptisia, Carex, and Wood Poppy.

AVOIDING HERBICIDE PHYTOTOXICITY

Some of the most serious problems we encounter in our livelihoods in the plant industry originate from chemicals such as herbicides. And when herbicides are at fault, the failures can be BIG! Recall the debacle from Dupont's Imprelis, released in 2010 before sufficient testing was performed? This herbicide affected so many trees and landscapes East of the Mississippi River! On a much smaller scale, we have verified serious catastrophes for individual landscapes much like Kathy experienced. Luckily, Kathy had very understanding clients who understood that mistakes do occasionally occur. Plus, Kathy's clients knew her company would make things right.

Following are some tips we might consider in our management practices to minimize the possibility of herbicide phytotoxicity.

Know The Herbicide: Many of us who make a living in the plant industry, whether we are farmers or landscapers, have used the same chemical products for years. We tend to gravitate to the same herbicide products that work for us. Even so, with only lackluster performance in some cases, we sometimes look for that magic bullet . . . that only requires one application a year, provides 100% efficacy, makes our customers overflowing with joy, and makes us lots of money. It is vitally important we know the chemical through experience and knowledge so serious mistakes do not occur.

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Photo 2: Hydrangeas are very sensitive to Prodoxaben. The plant in the foreground received less exposure to the pre-emergent herbicide than those in the background (left) where severe decline occurred.



Photo 4: Amelanchier (Serviceberry, Juneberry) foliage shows mottling and mosaic patterns typical of herbicide phytotoxicity.



Photo 3: This dogwood shows sparse foliage and dieback (inset) from Prodoxaben application.



Photo 5: This rose plant exhibits stem and leaf distortions, classical symptoms of herbicide activity.



Photo 6: Ferns were especially sensitive to Prodoxaben, often exhibiting dieback or "complete death" (note black, dead stems).

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Photo 7A



Photo 7B

Photos 7A & 7B: The Redbud in 7A, exposed to Prodoxaben, shows foliar thinning and unthrifty growth. The Redbud in 7B, in the same landscape but where no Prodoxaben was applied, exhibits very healthy, lush growth.

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Supplier Recommendations: Many of us depend on Suppliers for valuable information regarding options and the products they sell. Most of the time, their advice is accurate and warmly accepted. However, there are occasions when the Supplier may know less about their products than we would hope. In such instances, we need to be wary of their advice, especially if we do not have experience with the particular chemical they are recommending. I have experienced serious landscape Armageddons over the years resulting from Supplier or Applicator misunderstandings of various products.

Read the Label: Many of us are hesitant to read chemical/pesticide labels. The labels can go on for 75 pages of fine print or more. They may even be great sleep aids when we have nocturnal issues. And in the helter-skelter rush of the spring, we are even less inclined to read pesticide labels. Nevertheless, we are responsible for reading and understanding the label according to law. Recall that Kathy was told by her Supplier that Prodoxaben G was the same as Preen, the product that Kathy's company traditionally used with

abundant and rewarding experience. While the purpose of both products are pre-emergence herbicides, Preen has Trifluralin as the active ingredient while Prodoxiben G is composed of Prodiamine and Isoxaben. Kathy was misled. Even if the active ingredient(s) of products are the same, they may be labeled for different uses.

Don't Overreact: One of Kathy's major concerns when she contacted me was "what to do". Apply activated charcoal to absorb the chemical? Replace \$10,000s of landscape plants? Replace the soil? At some locations, specific plants were killed and would need to be replaced. However, there is a caveat to plant replacements in some situations; some herbicides persist for extended periods. Prodoxaben is marketed as a year-long pre-emergent herbicide; it is reported to persist for 5 months, possibly affecting any replacement plants as well. If some plants are to be replaced, the soil in the immediate vicinity would also likely need to be replaced. However, many if not most of the plants would likely survive the impacts of Prodoxaben and recover just fine the following year. Sometimes, our clients are very demanding and deficient in patience. Others are quite understanding.

Seek Assistance: When serious mistakes do occur, do not take the advice of one so-called "Expert". Anyone who thinks of themselves as an "Expert" is almost always well-intentioned. But we all make mistakes or do not have as much knowledge as we would like. There are many experienced and knowledgeable individuals from whom we can obtain advice. However, we need to weigh various recommendations and grasp those that just make a whole lot of sense (cents).

Prodoxaben undoubtedly is a good pre-emergent herbicide and is likely an effective weed control product in many situations. We must, however, make sure we understand the chemicals we apply so that serious mistakes do not occur. 🌱

Dr. David Roberts has retired from Michigan State University but remains active with the industry. He can be reached at 248-320-7124 or treedoctordave@gmail.com.