

THE PURDUE LANDSCAPE REPORT

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What the Fluff?!

(Karen Mitchell, mitcheka@purdue.edu)

As summer comes to a close, plants are rapidly releasing seeds and the most noticeable are the flying fluffy type. Thistles, asters, and milkweed are just a few of the summer-flowering plants that depend on the wind to disperse their seeds, sometimes carrying them miles away to potentially suitable locations, though seeds typically land with a few meters of the mother plant. This may not be a concern if it's a desirable plant, but can become extremely problematic when that seed comes from Canada Thistle (*Cirsium arvense*) (Fig. 1).



Figure 1. Canada thistle (*Cirsium arvense*), growing amongst common ivy (*Hedera helix*), produces a fluffy seed that is dispersed by wind.

Canada thistle is found on the list of Indiana Noxious Weeds (IC 15-16-7-2), which mandates that landowners take necessary steps to control and contain the spread of this highly invasive

species. Formal enforcement of this Indiana Code falls to Township Trustees, though weed control is a responsibility that is often overlooked. Landowners and homeowners shouldn't wait for a notice, or knock at the door, from a Township Trustee to begin controlling Canada thistle. It's listed as a noxious weed for good reason.

Canada thistle is a perennial plant that can reproduce from seed or rhizomes making it difficult to control and contain. Each plant can produce thousands of wind-blown seeds that may remain viable for up to 20 years in the soil. Rhizomes are horizontal underground stems that can grow several feet and put out new shoots (Fig. 2). To add insult to injury, if a rhizome is cut or tilled, a separate plant may grow from each piece of rhizome.



Figure 2. Canada thistle (*Cirsium arvense*) reproduces by growing horizontal underground stems called rhizomes. Rhizomes can send up new shoots several feet from the mother plant.

Mechanical and cultural control options for Canada thistle are limited and may reduce plant density, but are not effective at eradicating large, established populations in a landscape. A new population, without an established root system, may be controlled with frequent mowing to deplete food reserves and prevent seed production. Small, isolated populations may be controlled with hand-pulling, but this will need to be repeated every few weeks.

Chemical control options include pre- and post-emergent herbicides and, in many cases, applications of both types are needed for complete eradication. A pre-emergent herbicide, with an active ingredient of dichlobenil, is effective at preventing seed from germinating, but will not control established plants. A post-emergent herbicide with the active ingredient of clopyralid is the most effective option for home gardeners. Clopyralid is a selective herbicide for broadleaf weeds, but most vegetable and ornamental plants are susceptible. Precautions should be taken to avoid off-target damage. Read and understand the herbicide label before use. The label is the law.

Regardless of the method used, complete control of an established Canada thistle population will take persistence over multiple seasons. If the fluffy seed is beginning to fly from your thistle patch, it will likely take many more seasons to rid the garden of this pest, but it is possible. To win the battle against Canada thistle, it takes serious grit and an effective herbicide, or a good realtor.

Want to learn more? Check out these resources:

Indiana DNR: Terrestrial Invasive Species -

<https://www.in.gov/dnr/rules-and-regulations/invasive-species/terrestrial-invasive-species-plants/>

Understanding and Controlling Thistle in the Nursery and Landscape -

<https://www.purduelandscape.org/article/understanding-and-controlling-thistle-in-the-nursery-and-landscape/>

Control of Canada Thistle in CRP and Other Noncrop Acreage -

<https://www.extension.purdue.edu/extmedia/FNR/FNR-436-W.pdf>

When Roundup Isn't Roundup: Clearing up the confusion between products

(Kyle Daniel, daniel38@purdue.edu)

In the last newsletter, an article on triclopyr (www.purduelandscape.org/article/the-summer-of-triclopyr-mounting-evidence-for-off-target-damage/) brought up much discussion on the *Roundup* brands now containing multiple active ingredients other than glyphosate. Professionals in the industry may encounter a client with herbicide damage symptoms that mimic growth-regulator injury instead of typical glyphosate damage symptoms. While the client may have used *Roundup*, they didn't necessarily use glyphosate. Going forward, it's important to keep in mind that *Roundup* no longer means glyphosate in the consumer market.

Roundup has been one of the most used herbicides for many different weed control applications. *Roundup*, with the active ingredient glyphosate, was first registered with the EPA in 1974. When *Roundup* went off patent in 2000, glyphosate started being sold under many different names. According to the National Pesticide Information Center (<http://npic.orst.edu/factsheets/glyphogen.html>) there are currently over 750 products containing glyphosate. Formulations may differ with salt carriers, adjuvants, concentrations, and mixed with other herbicides.

Recently, Bayer announced glyphosate would be phased out of consumer *Roundup* products. In its place, consumer *Roundup* products include other active ingredients. This can lead to confusion in the consumer market. It's important to note that professional-use *Roundup* (turf and ornamental, agronomic crops, etc.) still contains glyphosate.

Within the consumer *Roundup* product line, there are many different formulations designed for specific purposes, which include *Roundup Weed and Grass Killer*, *Roundup for Lawns*, *Roundup for Lawns: Crabgrass Destroyer*, *Roundup Dual Action Weed and Grass Killer*, *Roundup Poison Ivy and Tough Brush Killer*, among others. Each of these products contains distinct active ingredients that target different types of weeds.



Figure 1. Consumer versions of Roundup are no longer glyphosate. Pay close attention to the active ingredients on labels to prevent unwanted plant injury.

Roundup Weed and Grass Killer: Glyphosate as the Active Ingredient

The original *Roundup* herbicide contains glyphosate as its primary active ingredient. Glyphosate is a systemic, non-selective herbicide, meaning it is absorbed by the plant and translocated throughout the vascular system, ultimately leading to the plant's death. Glyphosate works by inhibiting the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS), which is a key component of the shikimic acid pathway—a pathway critical for the synthesis of aromatic amino acids in plants.

Active Ingredient:

1. **Glyphosate:** The 'traditional' version of *Roundup* that controls many different weeds. Can take 10-14 days to kill weeds.
2. **Pelargonic Acid:** A contact herbicide that quickly breaks down cell walls. This is added to provide a quick burndown of the weed.

Roundup Dual Action Weed and Grass Killer Plus 4 Month Preventer: Multiple modes of action

Round Dual Action is a formulation that includes four very different herbicides that is intended for use in areas with limited vegetation (i.e. sidewalks, driveways, mulched beds). In addition to postemergence herbicides, this product includes two preemergence active ingredients.

Active Ingredients:

1. **Triclopyr:** Systemic herbicide that mimics auxins. Very effective herbicide for woody plants, which is used frequently in invasive species treatments.
2. **Fluazifop:** Grass-specific herbicide (graminicide) that controls several annual and perennial grasses.
3. **Diquat:** Contact herbicide that exhibit symptoms rapidly.

Good for annual weeds.

4. **Imazapic:** Pre- and Postemergence control of several grasses and broadleaf weeds.

Roundup for Lawns: A Combination of Selective Herbicides

Roundup for Lawns is a specialized formulation designed for residential use, particularly for controlling broadleaf weeds in lawns. Unlike traditional *Roundup*, which contains glyphosate, *Roundup for Lawns* contains a combination of selective herbicides, including MCPA, quinclorac, dicamba, and sulfentrazone. These ingredients are chosen for their ability to target broadleaf weeds and grassy weeds without harming most turfgrass species. This product is similar to the traditional 'three-way' herbicides that are commonly used in turf.

Active Ingredients:

1. **MCPA:** MCPA is a selective herbicide that mimics the action of natural plant hormones known as auxins. When absorbed by broadleaf weeds, it causes uncontrolled growth, leading to the plant's death.
2. **Quinclorac:** Quinclorac is effective against grassy weeds, primarily used for crabgrass control in turf. It can be similar to auxin herbicides, causing epinasty, curling, and a change of color.
3. **Dicamba:** Similar to MCPA, dicamba disrupts the growth of broadleaf weeds by mimicking natural plant hormones.
4. **Sulfentrazone:** Pre- and postemergence activity in turf. Very effective on nutsedge.

Roundup for Lawns: Crabgrass Destroyer

Roundup for Lawns: Crabgrass Destroyer is a product designed to control grassy weeds and several broadleaf weeds in cool-season turf. In addition to crabgrass, other grassy weeds and some broadleaves can be controlled.

Active Ingredients:

1. **Topramezone:** Very effective herbicide for several annual and perennial grassy weeds and some common broadleaf weeds.

Roundup Poison Ivy and Tough Brush Killer: Triclopyr for Tough Woody Plants

Roundup Brush Killer is formulated to tackle tough, woody plants, such as brush, brambles, and small trees. The active ingredient in this product is triclopyr, a selective herbicide that targets broadleaf plants with less damage to grasses. This product can be effective on invasive woody plants.

Active Ingredients:

- o **Triclopyr:** Systemic herbicide that mimics auxins. Very effective herbicide for woody plants, which is used frequently in invasive species treatments.
- o **Glyphosate:** The 'traditional' version of *Roundup* that controls many different weeds. Can take 10-14 days to kill

weeds.



Figure 2. Glyphosate damage to sycamore.

Conclusion:

All of the consumer *Roundup* products contain unique active ingredients tailored to specific weed control needs. There can be understandable confusion around these products due to the historical uses of glyphosate. The Green Industry needs to be aware of the confusion around these products to better inform their clients. Understanding the active ingredients and mechanisms of action of these herbicides is crucial for their effective and safe use in various settings.

Hot for August's End, Little Rain in Sight

(Jacob Dolinger, jdolinge@purdue.edu)

Pattern changes, like the one we've experienced in the middle of the month, are quite typical for August. The humidity decreases a bit, the soils dry out, and sometimes, like we've recently experienced, the temperatures drop quite dramatically. It can be refreshing and exciting for Fall lovers to experience some crisp, cool air in mid-August.

That being said, it's always too soon to rule out more summer heat—especially when the National Weather Service's Climate Prediction Center is forecasting a very likely chance of above normal temperatures for August 27-31 (Figure 1). In fact, NWS HeatRisk, an experimental product developed by NWS, is already forecasting category 2-3, moderate-major heat-related impacts starting Monday, August 26 and continuing through at least Tuesday, August 27. This means those who are sensitive to heat should reevaluate any outdoor work until the heat subsides. And not only is the CPC forecasting above normal temperatures in the near-term, but the monthly outlook for September is leaning toward above normal temperatures for Indiana as well.



Figure 1: the National Weather Service’s Climate Prediction Center is forecasting with confidence above normal temperatures for the rest of the month of august for Indiana and surrounding states.

On the flip side, there is almost no precipitation in the forecast across the Hoosier State through the end of the month (Figure 2). It appears that most of the state will receive 0.1 inches of precipitation, at best. While there are currently no drought conditions across Indiana, those with stakes in soil moisture should continue to monitor conditions heading into the drier months, especially since D0 conditions (abnormally dry) have started expanding across northern Indiana (Figure 3).



Figure 2: Pattern changes mean drier conditions for Indiana through the end of August. At best, the state will see 0.10 inches of precipitation.

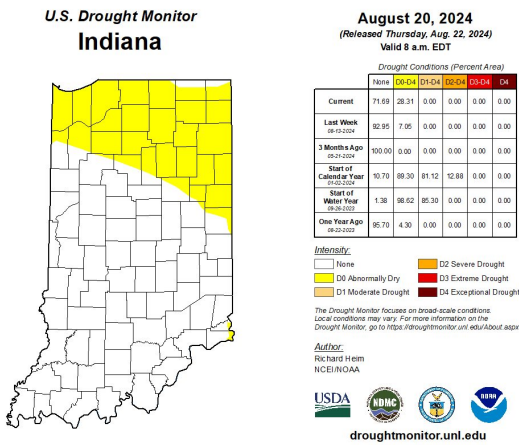


Figure 3: Abnormally dry conditions have been introduced for the northern third of Indiana.

Speaking of soils and agriculture, growing degree days remain above normal across the state. Since April 1, the entire state has been above normal, and in some places by upward of 200-250 units (Figure 4).

Growing Degree Day (50 F / 86 F) Departure From Average

April 1 - August 21, 2024

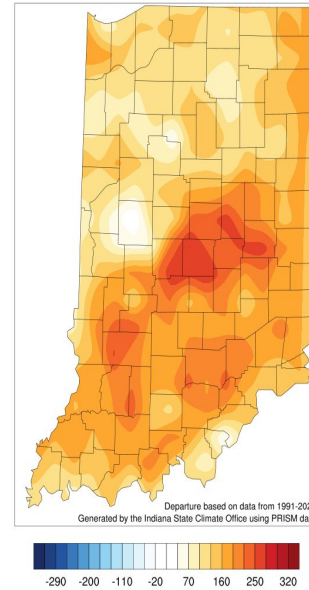


Figure 4: Growing Degree Days continue to remain above normal, even as the season comes to a close.

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