

Study explores effects of herbicide drift on white oak

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Herbicide drift, which occurs when pesticides "drift" from the targeted application area to a nearby non-targeted area, is a particular concern in Midwestern regions of the United States. In the Midwest, where the topography is relatively flat and large-scale farms and agriculture production facilities reside side-by-side with housing developments and woodlands, herbicide drift can have an impact on wildlife, livestock, timber production, and quality of life for human neighbors.

A study published in a recent issue of *HortScience* evaluated the effects of field corn herbicides on [white oak](#) seedlings. White oak, a popular landscape and forest species native to the eastern United States, has been suffering from an abnormality called "[leaf tatters](#)", which give the leaves a lacy appearance. Leaf tatters in white oak trees have been reported in states from Minnesota, south to Missouri, and east to Pennsylvania. This problem is not just aesthetic; it can affect a substantial portion of a tree's canopy, reducing the health of the tree. Leaf tatters make affected trees more susceptible to other stressors such as adverse environments, air pollution, and pests, and can make containerized [oak seedlings](#) unmarketable.

Jayesh B. Samtani, John B. Masiunas, and James E. Appleby from the Department of Natural Resources and Environmental Sciences at the University of Illinois at Urbana-Champaign, studied the effects of field corn herbicides on white oak at different stages of development. The experiment simulated [herbicide drift](#) using herbicides commonly applied to corn and previously found to injure plants.

"We chose to treat white oak seedlings at the swollen bud, leaf unfolding, and expanded stages of leaf growth", Masiunas explained. "Previously, it was suspected that insect feeding, environmental factors, or herbicide drift could cause leaf tatters. Our preliminary research eliminated insect feeding as a cause of leaf tatters and found trees near [agricultural fields](#) were most likely to be injured. Based on our observations, we theorized that leaf tatters were caused by drift from herbicide applications before or at corn planting."

The researchers found that visual injury to white oak seedlings was dependent on year, herbicide treatment, concentration, growth stage, and rating date. The type, intensity, and persistence of injury symptoms differed among herbicides. The study results indicated that herbicide applications near white oak should be timed before leaf unfolding or after the expanded leaf stages.

This research is the first to document leaf tatters injury from exposure of oaks to chloroacetanilide herbicides (using dose rates of 1%, 10% and 25%). The scientists recommend further research to determine how multiple occurrences of leaf tatters affect white oak stands, how atrazine influences leaf tatters, and if lower rates of chloroacetanilide herbicides cause injury.

More information: The complete study and abstract are available on the ASHS HortScience electronic journal web site: hortsci.ashspublications.org/content/43/7/2076

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