

METHODS TO TAME *AILANTHUS* IN MIXED OAK FORESTS, WHAT WORKS: PRESCRIBED FIRE, HERBICIDES, OR BIOLOGICAL CONTROL?

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Abstract—Just as oaks can thrive in disturbed forests, so can non-natives trees like *Ailanthus*. Proactive land management integrates control strategies at a landscape level to minimize the spread of nonnatives. Unfortunately, current control recommendations for *Ailanthus* are inconsistent and often ineffective. Over the last several years, we have conducted studies to quantify the impacts of silvicultural practices on *Ailanthus* populations within mixed oak forest landscapes. We analyzed the presence and abundance of *Ailanthus* across the landscape in relation to prescribed fire, timber harvest, and stand structure. We found that recent timber harvest activity (< 25 years) was the best predictor of *Ailanthus* presence. In other words, we found that fall stem-injections of *imazapyr* herbicide (6 percent a.i.) were 100 percent effective in killing *Ailanthus* trees and saplings compared to a winter herbicide treatment followed by a prescribed fire (86 percent decrease), or prescribed fire alone (10 percent increase). Post-burn, *Ailanthus* germinants and sprouts from top-killed saplings and trees were poor competitors with faster growing post-fire woody regeneration as forest floor shading increased over subsequent years. More recently, we began testing a native fungus *Verticillium nonalfalfae*, as a biological control agent for *Ailanthus*. After two growing seasons, 78 percent of inoculated trees were either dead or 90-100 percent defoliated. Studies are ongoing to develop biocontrol methodologies, continue non-target risk assessments and study post-inoculation fungal spread. The goal is develop integrated recommendations for cost-effective control of *Ailanthus* in Appalachian forests.

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