

Redheaded pine sawflies on young longleaf. Photo by Lisa Lord.

Longleaf Resiliency: Insects and Diseases

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A collaborative network of partners - including federal and state agencies, nongovernmental organizations, private landowners, and other sectors - has joined together to restore the longleaf ecosystem through America's Longleaf Restoration Initiative. The future will likely bring environmental changes including less predictable weather (e.g. flooding, hurricanes, and drought), wildfires, and insect and disease outbreaks. Longleaf pine (*Pinus palustris*) provides high quality timber and excellent wildlife habitat, and it is resilient with respect to these growing ecological challenges. While longleaf pine is not immune to these threats, including insects and disease, its high tolerance against these potential damaging agents (especially compared to other southern pines) makes it a desirable choice for landowners, land managers, and the forest industry.

INSECT AND DISEASE THREATS TO SOUTHERN PINE TREES

Southern pines face threats from insect pests such as the Nantucket pine tip moth, regeneration weevils, and bark beetles, and diseases such as pitch canker, heterobasidion root rot, brown spot needle blight, and fusiform rust. When trees become stressed, they are more susceptible to attacks by insects and pathogens. Longleaf pine has traits that help make them more resistant than other southern pines.

Bark Beetles

All southern pines are susceptible to the southern pine beetle, but longleaf pine is considered the least vulnerable of the major timber-producing pine species – which is significant considering the southern pine beetle is the #1 pest of pines in the eastern U.S. Proper stand management has been shown to decrease the likelihood of a southern pine beetle infestation. Southern pine beetle outbreaks tend to begin in stressed stands, so keeping stands thinned and free of other competition can go a long way in preventing southern pine beetle outbreaks.

Longleaf, like other pines, is susceptible to Ips bark beetles and the black turpentine beetle, but these beetles are only an issue when trees get stressed or wounded. Stress may come from storm damage, drought, or poor management. We may see more stressed trees in the future with increasingly unpredictable precipitation patterns. If so, longleaf is well-positioned as it is more drought-resistant than other pines and has resin characteristics that increase its resistance to bark beetle attacks.



Longleaf pine isn't completely immune to pests and diseases. This stand suffered heavy Ips bark beetle damage, which brought on by drought after a recent thinning. Photo by David Moorhead.

Pine Regeneration Pests

Even when young, longleaf pine is more resilient to pine regeneration pests. Longleaf pine is rarely impacted by the Nantucket pine tip moth, and only occasionally impacted by the pine shoot moth. It is thought the thickness of the longleaf pine shoot is too large for these insects to utilize. The southern pine coneworm occasionally attacks longleaf pine terminal buds. Compared to other southern pines, longleaf pine is less susceptible to regeneration weevils – but damage from the Pales weevil can happen. When it does, the weevils usually attack the longleaf pine seedling just below the soil line, on the upper part of the taproot. Weevils may also chew at the base of the grass stage needles, leaving a “clipped needle” appearance. Pine sawflies, however, can be damaging to longleaf pine. These caterpil-

lar-like insects (they're actually the young of a stingless wasp) eat the needles and can defoliate a stand during insect outbreaks. They consume the needles back to the stem, leaving little green nubs where needles should be.

Fungal Pests

Fusiform rust, heterobasidion root rot, pitch canker, and brown spot needle blight are all diseases that can impact longleaf pine. Longleaf is less susceptible than other southern pines to fusiform rust, which can cause cankers on the stem branches - cankers which can lead to stem breakage and tree mortality. Fusiform rust is easily identified in the spring, when the bright orange spores are readily visible. Heterobasidion root rot is also uncommon on longleaf pine. This disease leads to a slow decline of the tree, but it is difficult to diagnose because roots must be excavated to find the damage. Longleaf pine is susceptible to pitch canker (as are other southern pines), which can be recognized by the copious amounts of resin which seep from the canker areas. One disease more common on longleaf pine than in other southern pines is brown spot needle blight, which tends to impact trees in the grass or early sapling stage, causing premature needle loss. Fortunately, this disease can be easily managed using prescribed fire, as the fire will burn and eliminate the fungal inoculum.



Brown spot needle blight on longleaf pine needles. The fungus appears as a brown spot surrounded by a yellow halo. Photo by David Coyle.

MANAGEMENT RECOMMENDATIONS

- Although longleaf pine is resilient, it is still susceptible to insects and diseases from inadequate management practices (or in some cases, bad luck). When trees become stressed, they are more vulnerable to pests, so proper establishment and stand management is key.
- Choose pest-free nursery stock to avoid introducing problems to the site. Fusiform rust, in particular, can be a problem in some pine nurseries.
- Avoid overstocking to reduce competition and stress, and thin the stand when appropriate.
- Avoid injuring trees during thinning operations. Tree injuries are often attractive to bark beetles.
- Use natural regeneration allowing the forest to maintain its diversity, and with it, its resistance.
- Use prescribed fire, but again, avoid damaging trees. Prescribed fire is one of the best tools available to combat brown spot needle blight, and prescribed fire and thinning are your best tools against southern pine beetle outbreaks.
- Monitor the stand frequently for any signs of stress or insect and disease infestations and take action if necessary.

THANK YOU TO OUR PARTICIPATING PARTNERS



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