Longleaf Leaflet

2019

Managing pine straw stands to reduce tree stress

LL-#14

Across the Sandhills people are noticing longleaf stands with trees whose needles are turning yellow, red and then brown. The affected trees are commonly found in overcrowded longleaf stands growing on sandy, less fertile soils, often former agriculture fields, that are being raked for pine straw. The number of dying trees seems to have increased following recent droughts; the cause - a bark beetle infestation**.**

Bark beetles invaded, but are *Ips* beetles the real reason the trees died?

Ips engraver beetles are opportunists that attack weak or dying pines. They are attracted to stressed trees, logging debris and damaged branches. Generally *Ips* beetles infest only small groups of trees in a stand.

Reddish or whitish pitch tubes that resemble popcorn are often seen on the bark. The uniquely shaped tunnels found under the bark (I, Y, Z, or H feeding galleries) help identify an attack by *Ips* beetles.

Eventually the feeding girdles the tree, killing it.

Diagnosing *Ips* is only half of the puzzle. Something else damaged or stressed the trees first, giving the *Ips* an opportunity to invade.

Natural factors that weaken trees include: lightning strikes, drought, storm damage and poor stand conditions. Human activities can also unknowingly stress trees.

Stressed stands are often:

- Overcrowded *(too many trees competing with each other).*
- Growing on droughty, infertile, sandy soils (*common longleaf sites).*
- Compacted *(former agriculture or heavy equipment in stands).*
- "Overdosed" from soil active herbicides *(like imazapyr).*
- Root wrenched and leaning *(from high winds or ice storm).*

Secondary pests like *Ips* often tell us we are not treating our trees right.

Is the stress of pine straw raking inviting pests into your longleaf?

Raking furthers stress by removing needles that provide nutrients as they decay and that act as a mulch to preserve soil moisture. Combine these stresses with a drought and it is more than the tree can take. *Ips* beetles seize upon the opportunity.

Longleaf stand with 40 percent tree loss after Ips infestation*. Stressors included sandy soils, overcrowded stocking, and raking/ burning during a drought.*

While longleaf pine straw is a valuable source of income, harvesting it can come at a cost to forest health. The same benefits pine straw provides as a landscaping mulch apply to the forest floor. Removing pine needles reduces soil moisture and nutrients available from litter decomposition. Raking also increases soil compaction, thus reducing rainfall infiltration and increasing runoff from the soil.

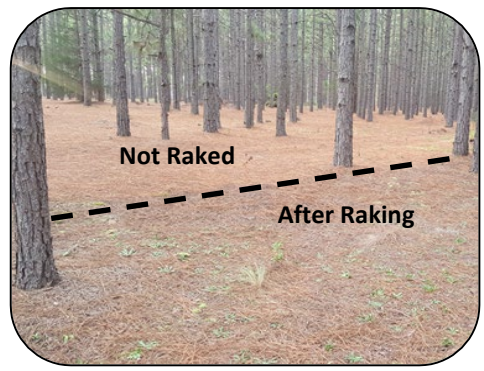
Sound longleaf management should include a pine straw harvesting regime and activities that minimize the stress and negative impacts to your woodlands.

Manage for longleaf stand health. Don't "mine" straw!

Give the trees room to grow.	**More room to grow = more resources** (water, light and nutrients) to support the growth of roots and needles. Trees that are too crowded cannot get enough resources and ultimately health and vigor decrease (and susceptibility to pests increases). The best thinning regime to maintain a healthy growth rate is to thin to a basal area (BA) of 90 square feet per acre when the stand exceeds 140 square feet of BA.
Rake once a year.	Ideally rake in the fall during peak needle drop (October – November). Raking before the trees shed all their needles allows for needles that fall later to remain on the forest floor.
Rake only red straw.	Leave a layer of gray straw to hold in moisture**.** The newly fallen, red needles are the more desirable product for buyers.
Rest the stand.	Instead of raking annually, begin a raking cycle that has a rest period. Consider raking every third year to allow for a prescribed fire: **Rest, Burn, Rake**. At maximum, rake every other year.
Use fire.	There are numerous benefits to prescribed fire in longleaf stands, including pine straw production. Burning helps control competition, "cleans" the stand from unwanted debris, and provides a burst of nutrients to the trees.
Rotate your raking.	Consider dividing your pine straw stand into three raking units so that you can rake one unit, burn one unit, and let one unit rest in a given year.
Fertilize.	Apply fertilizer every 6 – 8 years to replace lost nutrients. Don't overdue the nitrogen. Longleaf doesn't need or like over 100 lbs. of nitrogen applied per acre. Include micro-nutrients such as boron, calcium, and magnesium.
Use caution during droughts.	Pine trees are most susceptible to attack from *Ips* engraver beetles during drought conditions. Consider holding off on thinning, fertilization, or prescribed burning that may cause unintended stress to the stand.

Annual, intensive raking exposes the bare mineral soil leading to increased moisture loss.

VS.



Raking to remove only the valued red straw leaves an intact litter layer to hold moisture.