



Longleaf Leaflet

LL-#10

March 2011

North Carolina Division of Forest Resources

HARVESTING PINE STRAW IN LONGLEAF PINE PLANTATIONS

Real income potential is possible on many longleaf forests found in eastern and southeastern North Carolina. This Forestry Leaflet explains the typical manner in which longleaf pine straw is harvested.

METHODS of HARVEST and REMOVAL

PLUNGER-TYPE WIRE BALERS - The most popular image of pine straw harvesting is that of a crew with pitch forks loading a plunger-type baler in the woods. For many years this was the only method for gathering "straw." In natural stands or plantations of longleaf, needles were concentrated in piles with pitch forks and a tractor mounted plunger baler was driven to each pile and loaded by hand. Bales were fastened with wire lengths and piled for later transport on a flat-bed farm truck. This method is labor intensive and time consuming because each bale had to be fastened by hand. While some small producers still use this method, most larger operators have parked their plunger balers in favor of small hay balers that fasten the needles with polypropylene twine.

BOXING or HAND BALING - Boxing is perhaps the most primitive and labor intensive of all pine straw production methods. Simply stated, boxing is the placement of pine needles in a small bale-sized crate with a hinged top. On top of the box, a large lever allows the operator to compress the pine straw within the confines of the box. Repeating this process, a tight bale is produced. The bale is tied by hand with twine that was placed in the box prior to loading. The boxing approach replaces the high cost of a mechanized baler with the cost of hand labor. Boxing has a specific niche in the pine straw industry in dense woods or remote locations where conditions would preclude the use of a baler. Boxing can be competitive when abundant, inexpensive labor is available, or money is limited. (See Longleaf Leaflet #11 - A Low Cost Box Baler)

MECHANIZED HAY - BALERS - For increased efficiency, availability of parts and service, many producers use agricultural hay balers for in-woods harvesting and particularly at buying stations or concentration yards. It didn't take producers long to realize that hay balers were not designed for the deep woods or the scrub oaks, limbs and cones that

find their way in to the bales. Likewise, the large width of mechanized hay balers limited their use in all but the cleanest and most widely spaced longleaf stands. The increased demand for pine straw brought about the switch to a smaller, "European" sized hay balers that produce a 12 inch by 14 inch face on a bale versus the standard 14 inch by 16 inch chamber.

To facilitate mechanized baling of pine straw, producers also needed a more efficient manner to rake needles into windrow. Adapting field hay rakes to woods conditions took some minor engineering, but many producers shortened and strengthened existing hay rakes for in-woods operation. In plantations, corridors or haul-rows are spaced evenly throughout the stand to facilitate baling on long and efficient windrows. In natural woods settings, windrows will, by necessity, be placed in any suitable area that will facilitate maneuvering of a hay baler.

HAULING LOOSE PINESTRAW TO "BUYING STATIONS" - The least capital-intensive of all harvesting methods entails only a pitchfork and a vehicle to transport the loose straw to a "buying station" or concentration yard. The raker is a primary producer, essentially a harvester and transporter of the raw material to a location where longleaf needles can be further processed. The buyer supplies the processing, storage and marketing branch of the enterprise. The raker assumes little risk in the marketing of the final product but will be forced to accept the going price for the product at time of delivery. In exchange for his delivered pine straw, the raker receives a check for services once a week or daily as agreed. The raker assumes the responsibility of locating, securing and paying the landowner for the pine straw. Written contracts for pine straw removal are becoming more common, but many transactions are still arranged on a verbal basis. The contract can dictate payments "per-bale" or they can require the buyer to pay the landowner a lump-sum for a fixed acreage of pine straw to be raked.

This publication was made possible through funding from the American Recovery and Reinvestment Act.

RAKING LONGLEAF STANDS

Pine straw harvesting is easily mechanized in existing longleaf plantations. The even spacing and generally closed canopy of longleaf plantations makes for high yields of clean, weed free pine straw. Plantations on existing farmland or previously cleared land lack the natural vegetation that can hinder straw gathering. Likewise, plantations are often free from the hardwood competition that is so common in natural longleaf stands where fire has been excluded. Plantations frequently yield pine straw as early as 12 years after planting but raking is common in 10 year-old stands.

Establish access or haul roads by removing every fourth or fifth row of trees within a plantation. Retain as many healthy, full-crowned trees as possible. Place access roads in open spaces where trees are thin, ice damaged or diseased. Once corridors are established, all mechanized work can then be directed to row centers. Typically, a small (17 – 25 horsepower) tractor pulls a modified hay rake between the trees into a central windrow. Hand raking, with pitchforks, allows for the collection of needles adjacent to tree trunks without unwanted injury to the crop trees.

Once a long windrow is complete, inspection and hand removal of large cones and sticks proceeds.

After the windrow is cleaned and reshaped, a mechanized baler is propelled along the length of the windrow by a tractor. Finished bales are then

collected and loaded on wagons, flatbed trucks or trailers. Variations on this procedure are the rule rather than the exception. Each stand will differ greatly according to terrain, age of trees, former land-use, distance to highway and other constraints. Often, pine straw is raked to several large piles where a stationary baler processes the straw. This method is preferred when a truck or trailer can be moved directly to the baling area to minimize material handling. Your harvesting scheme should ultimately be determined by convenience and the tract's accessibility.

RAKING NATURAL STANDS - Managing for pine straw production in natural stands requires a healthy dose of persistence and understanding of the ecology of longleaf. The longleaf tree has adapted wonderfully to the repeated wildfires that frequently burned through the Sandhills. Protection of the forests from wildfires has allowed the blackjack and turkey oaks to dominate many longleaf pine stands. The management of longleaf stands for pine straw production becomes a battle against hardwood and weed competition.

Natural stands offer the landowner and pine straw producer a tremendous payback potential for a small investment. The extent of payback is directly related to the ease of making the stand accessible and free from competition. There are several methods used to remove hardwood brush from longleaf stands and each has an associated cost in manpower, time and money:

| Type of Control | How / When | Benefits | Drawbacks | Typical Cost |
|---------------------------|-----------------|--|--|---|
| Mechanical | Anytime | <ul style="list-style-type: none"> • Quick • Efficient • Immediate pine straw production • OK in populated areas | <ul style="list-style-type: none"> • Can cause erosion • Specialized equipment needs • Debris disposal • Can uproot native plants (grass/herbs) | Potentially high (depends on amount of competition) |
| Prescribed Burning | Fall and Winter | <ul style="list-style-type: none"> • Natural • Effective • Promotes native plants • Cost effective when competition is minor | <ul style="list-style-type: none"> • Smoke problems • Not suggested near houses and livestock farms • Specialized skills required • Liability concerns | Relatively Inexpensive |
| Chemical | Growing Season | <ul style="list-style-type: none"> • Protects soil • Specifically targets competition species • Hand-applied • Effective | <ul style="list-style-type: none"> • Stigma against herbicides • Equipment needs • Availability of contractors | Low to Moderate |

See your local forester for more information on which competition control combination would be best suited to your individual conditions.



The North Carolina Division of Forest Resources is an equal opportunity / affirmative action employer. Its programs, activities and employment practices are available to all people regardless of race, color, religion, sex, age, national origin, handicap or political affiliation. This is a 'print-as-needed' document available at N.C. Division of Forest Resources offices and at www.dfr.nc.gov.



This publication was made possible through funding from the American Recovery and Reinvestment Act.