Manage your forest for pine straw and rake in the profits!

Becky Barlow
Alabama Cooperative Extension System

John Kush
Research Fellow

Auburn University School of Forestry and Wildlife Sciences
3301 Forestry and Wildlife Building
Auburn University, AL, 36849

Forest farming: A form of agroforestry where we cultivate or collect specialty forest products

- Managing the forest to produce things called non-timber forest products (NTFPs) that can be sold yearly or on a short-term basis

  - **Often think of edibles**
    - Bee products
    - Medicinals
    - Fruits, nuts, and edible flora
    - Mushrooms

Forest farming: cultivating or collecting specialty forest products

- Often we don't consider non-edible, wildcraft, and landscaping items as "forest farming" products
  - **Crafts and Home**
    - Walnut ink
    - Bark baskets
    - Firestarters/"Fatwood"
    - Floral industry –Vines, cones, leaves
  - **Landscaping**
    - Pine straw

Wildcraft: harvesting wild-grown NTFPs

- Wildcraft Professionals
  - May have part or all of their income from the harvest of NTPFs
  - Follow seasonal and regional availability
  - May distrust recreational harvesters
- Wildcraft Recreationists
  - Harvest for their own use or as gifts
  - Better connected to forest managers

Non-edible and landscaping NTFP examples

- **Crafts, Home, and Landscaping**
  - Firestarters/"Fatwood"
  - Floral industry –Vines, cones, leaves
  - ***Pine straw***

Pine straw – from forest to the front yard

- These needles can be raked and harvested in December or January and sold to retailers or landscapers who use it as ground cover
- May be raked by hand or machine baled

Pine straw – from forest to the front yard

- A popular landscape mulch, pine straw is the needles that fall from **Longleaf**, **Slash**, or **Loblolly** pines during October and November

Not just a "southern thing"

- Great Lakes states of
  - Michigan
  - Wisconsin
  - Minnesota

- Red (Norway) Pine (*Pinus resinosa*) and Eastern White Pine (*Pinus strobus)*

F-220001

FIGURE 7.—Frank Outland, of Northampton County, N. C., gathers valuable woods straw and leaf mold for use and for sale, and cuts fuel wood and saw timber from these woods

The remaining stand is composed of thrifty, fast-growing, high-quality trees that can be thinned again in 15 years or less for poles or small saw timber.

PINE STRAW—A COMMERCIAL PRODUCT

A. B. Williams, Wade, N. C., makes a regular income selling pine straw (leaves or needles) from his 10-acre patch of pines. He sells the straw on the ground at the rate of 25 cents per cartload. As an acre produces three to five loads his net income is from 75 cents to $1.25 per acre yearly. A farmer near Fayetteville, N. C., makes his chief living from raking his pine straw and selling it in town for $3 a load. In the strawberry sections of the South, pine straw unraked on the ground brings from $2 per acre in North Carolina (fig. 7) to $5 in Mississippi.

Not a new idea

Profits from farm woods. Money-making examples from Southern farmers.
WR Matoon

September,1930

Available http://organicroots.nal.usda.gov/download/CAT87205567/PDF

Longleaf (*Pinus palustris*)

- These pines are easily identified by long, 8- to 18-inch needles that are in bundles of three per fascicle
- Cones are also much larger than those of other southern pines
- Found on wide variety of soils - not just dry and rocky
- Sites do not support higher quality oaks
- May be found on drier sites with fire tolerant oaks
  - blackjack oak, bluejack oak, and sand live oak

Slash (*Pinus elliottii*)

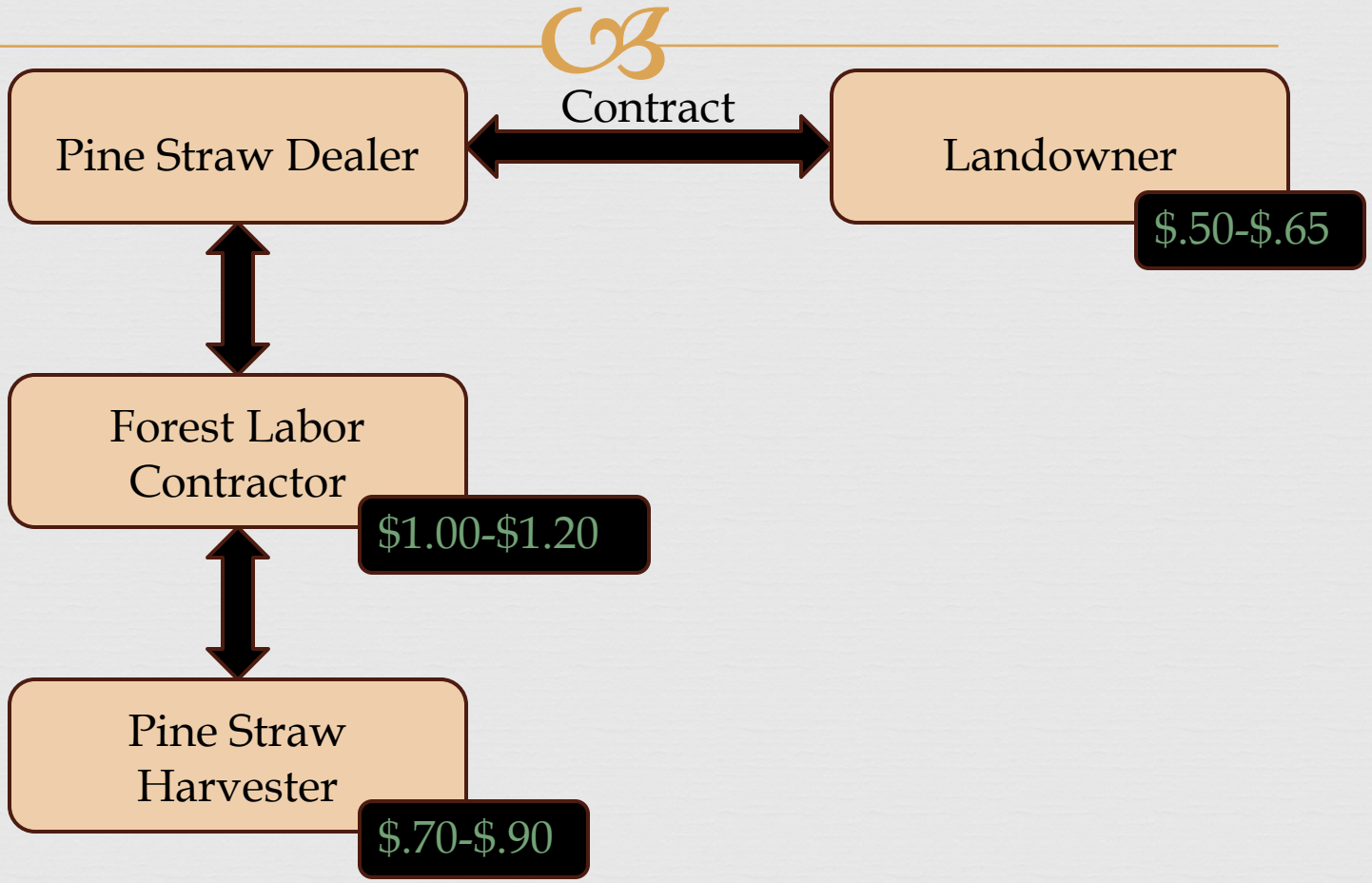
- Needles are usually 5 to 11 inches long with two to three per fascicle
- Cones are not prickly and are 5 to 8 inches long
- Naturally occurs within 150 miles of the coast
- Grows best in well drained soils with high moisture

Loblolly (*Pinus taeda*)

- Loblollies have 4- to 9-inch needles that are in bundles of 3 per fascicle
- Cones are about 6 inches long and are prickly to the touch
- Usually on moist to well drained sites
- Limited to no range on deep sandy soils

Forest farming of pine straw

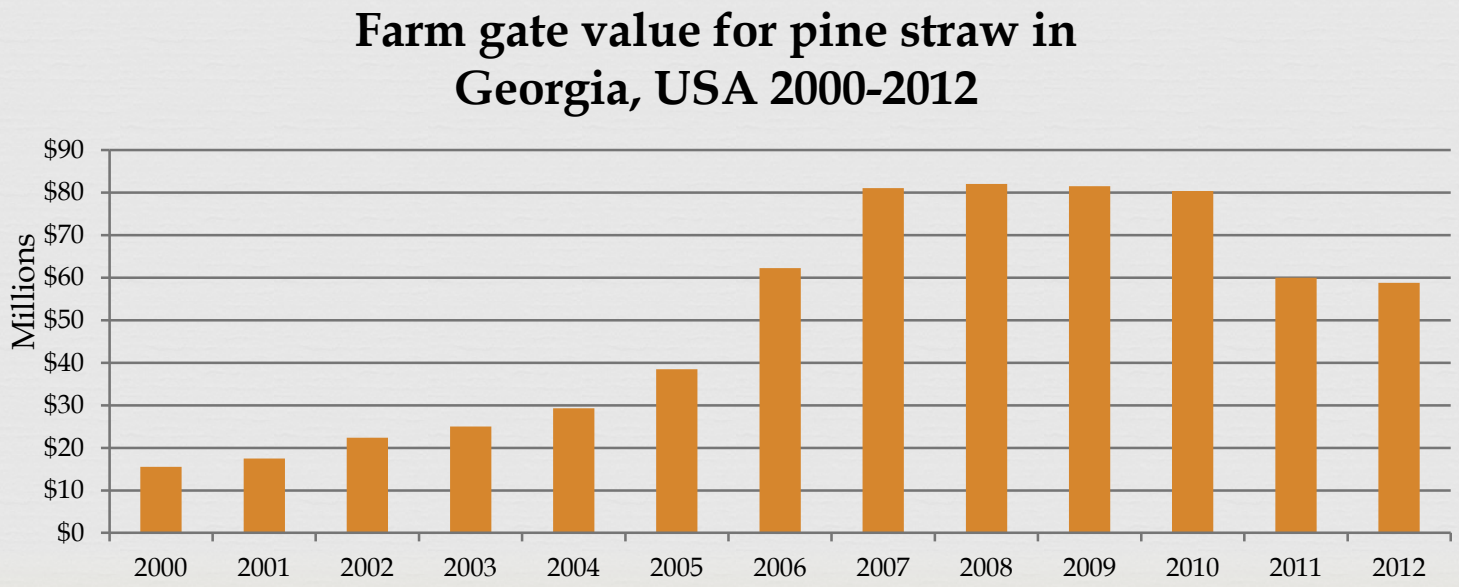
Industry Chain



Adapted from Cassanova 2007

Potential for Pine Straw

In 2012, pine straw accounted for 9.6% of Georgia's forest products market ($58.7 million)



Potential for pine straw
J.F. Dyer, 2011

- Pine straw yield data collected as part of the Regional Longleaf Growth Study
- Demands and preferences of Alabama pine straw consumers
- Willingness of Alabama forestland owners to establish pine straw harvesting operations

Pine straw yield data

- In 2011, sample data were analyzed to develop a model for pine straw yields from naturally regenerated longleaf pine stands (Dyer 2012)

Regional Longleaf Pine Growth Study

- In 1964, the USDA Forest Service established the Regional Longleaf Pine Growth Study (RLGS) in the Gulf States
- The original objective of the study- To obtain a database for the development of growth and yield predictions for naturally regenerated, even-aged longleaf pine stands
- Needlefall yields were sampled from 201 RLGS plots between 1993-1997

How much pine straw can potentially be produced?

Model to estimate longleaf pine bales/acre/year production potential

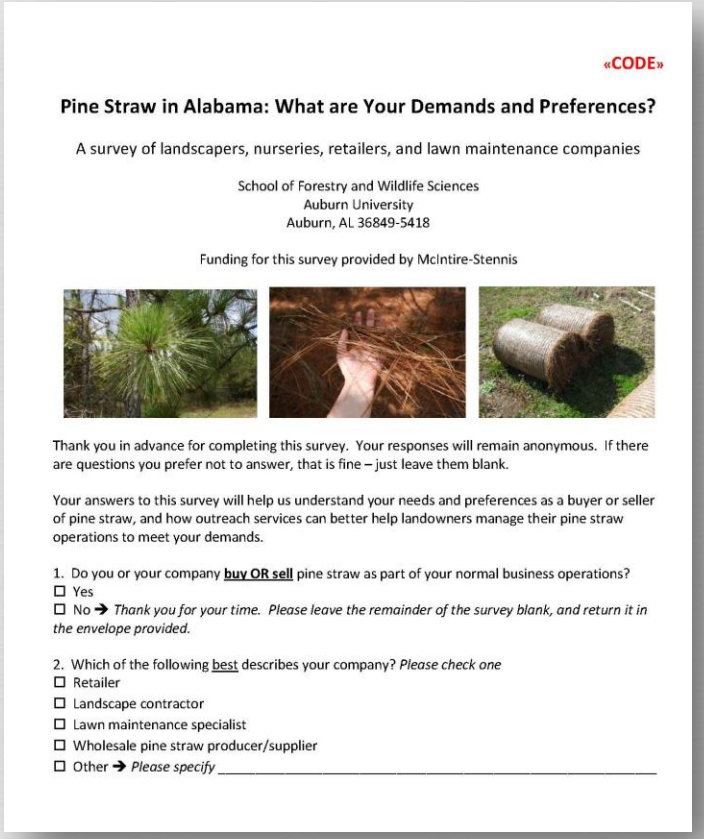
Bales/acre/year= (1.266)BA + (-0.266)age + (1.228)SI + 21.043

R^2 = 68.1%

- For naturally regenerated longleaf pine stands that
  - have 30 to 151 sq. ft. of basal area (BA),
  - are between 18 and 40 years old (age) ,
  - have a site index between 56 and 79 (base age 50) (SI),
  - have between 50 and 1400 trees per acre

Pine Straw Buyer Survey

- Fall 2010
  - 6 metro regions
- Recipients:
  - Retailers
  - Landscape contractors
  - Lawn maintenance specialists



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Pine Straw in Alabama: What are Your Demands and Preferences?

A survey of landscapers, nurseries, retailers, and lawn maintenance companies

School of Forestry and Wildlife Sciences
Auburn University
Auburn, AL 36849-5418

Funding for this survey provided by McIntire-Stennis

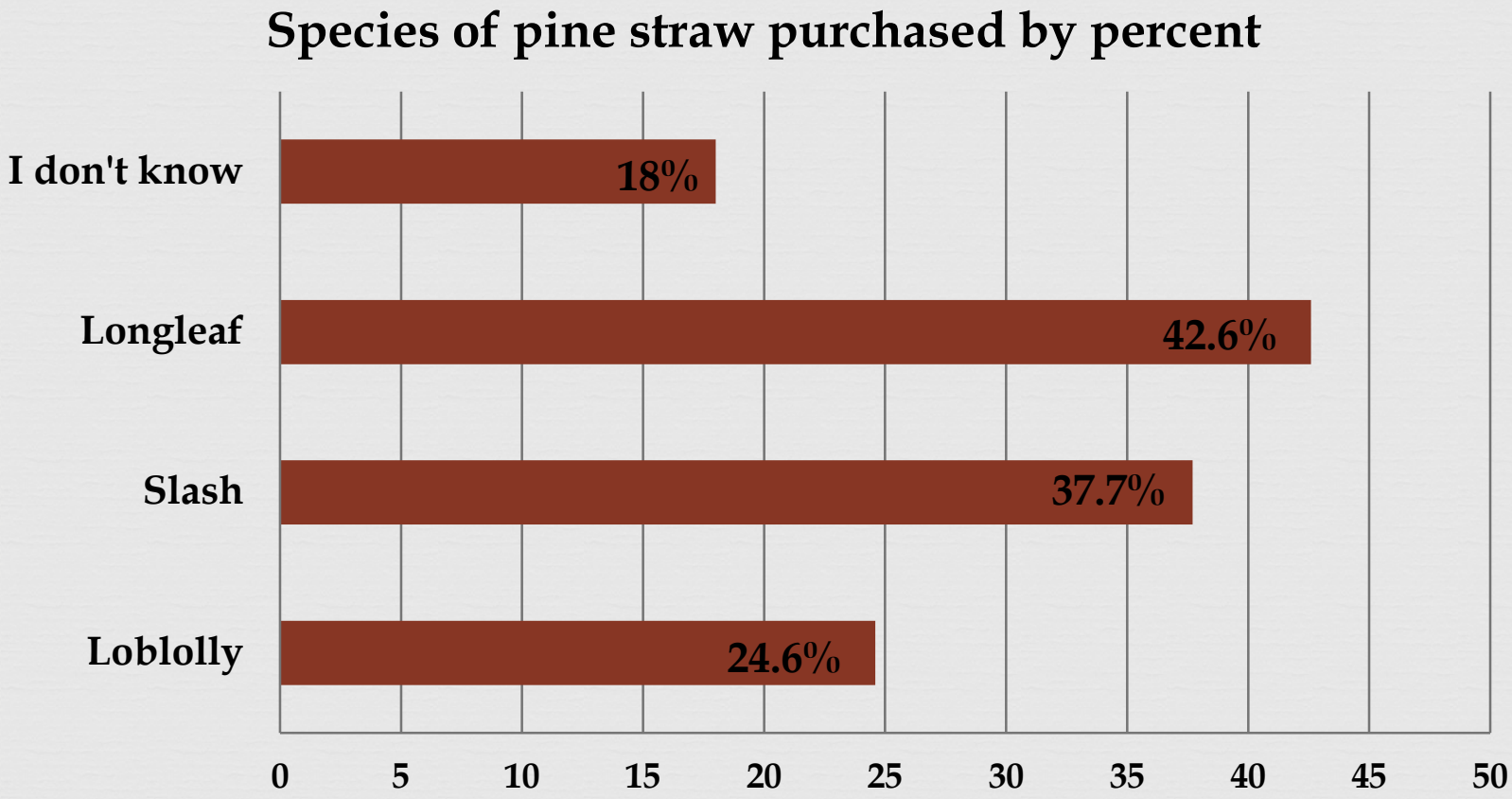
Thank you in advance for completing this survey. Your responses will remain anonymous. If there are questions you prefer not to answer, that is fine – just leave them blank.

Your answers to this survey will help us understand your needs and preferences as a buyer or seller of pine straw, and how outreach services can better help landowners manage their pine straw operations to meet your demands.

1. Do you or your company **buy OR sell** pine straw as part of your normal business operations?
☐ Yes
☐ No ➔ *Thank you for your time. Please leave the remainder of the survey blank, and return it in the envelope provided.*

2. Which of the following best describes your company? *Please check one*
☐ Retailer
☐ Landscape contractor
☐ Lawn maintenance specialist
☐ Wholesale pine straw producer/supplier
☐ Other ➔ *Please specify* _____

Species Purchased



Pine Straw Origin

Distance between origin of pine straw (the forest) and place of business (N=65)

Distance	Percent of N
I don't know	27.0
Less than 10 miles	6.3
10-25 miles	9.5
26-50 miles	12.7
51-75 miles	3.2
76-100 miles	3.2
101-150 miles	4.8
151-200 miles	14.3
More than 200 miles	19.0

> 1/4 of respondents don't know

~1/3 of respondents get pine straw from > 150 miles away

Seasonality of Pine Straw

Mean ranking of seasonality of pine straw buying by month (N=56)

Month	Ranking
April	1.58
March	1.61
May	1.86
October	1.92
November	2.25
June	2.45
September	2.59
July	2.68
August	2.74
February	2.96
December	3.02
January	3.36

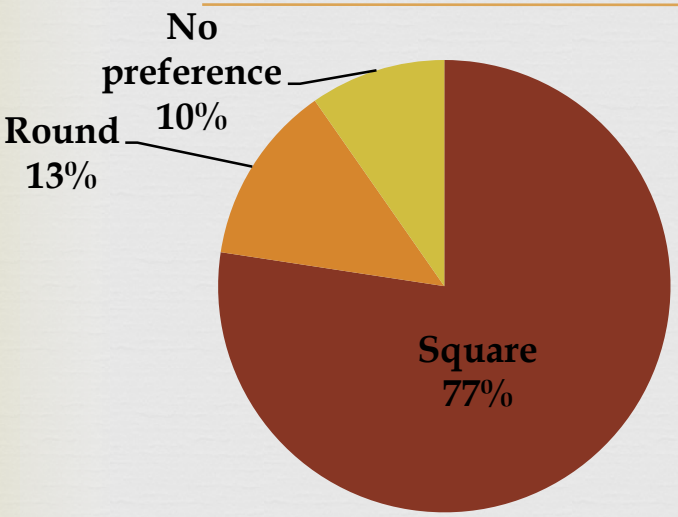
Ranked from 1 (busiest) to 4 (least busy)

Busiest months are in spring

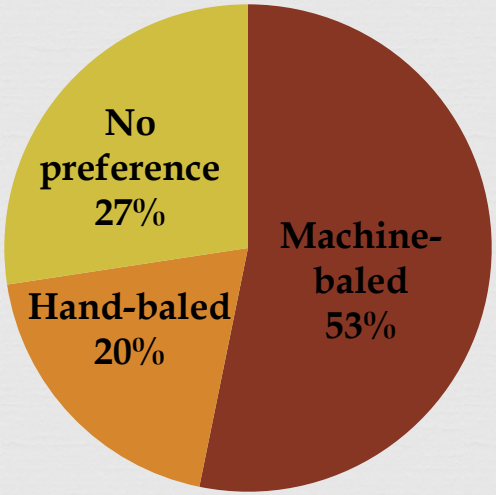
Note: Needle fall is typically highest in September, October and November

Least busy months are in winter

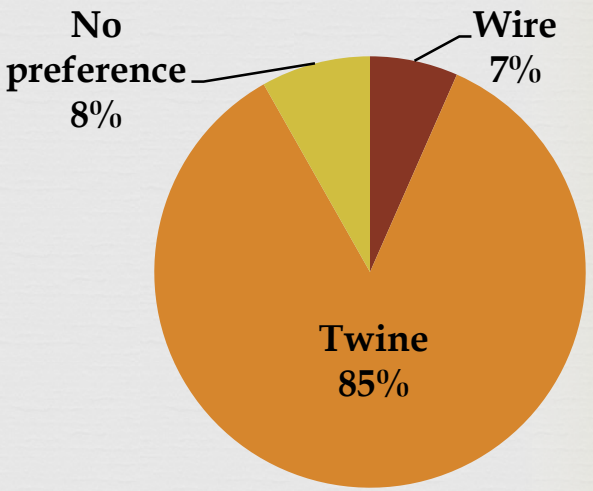
Pine Straw Preferences



Bale Shape

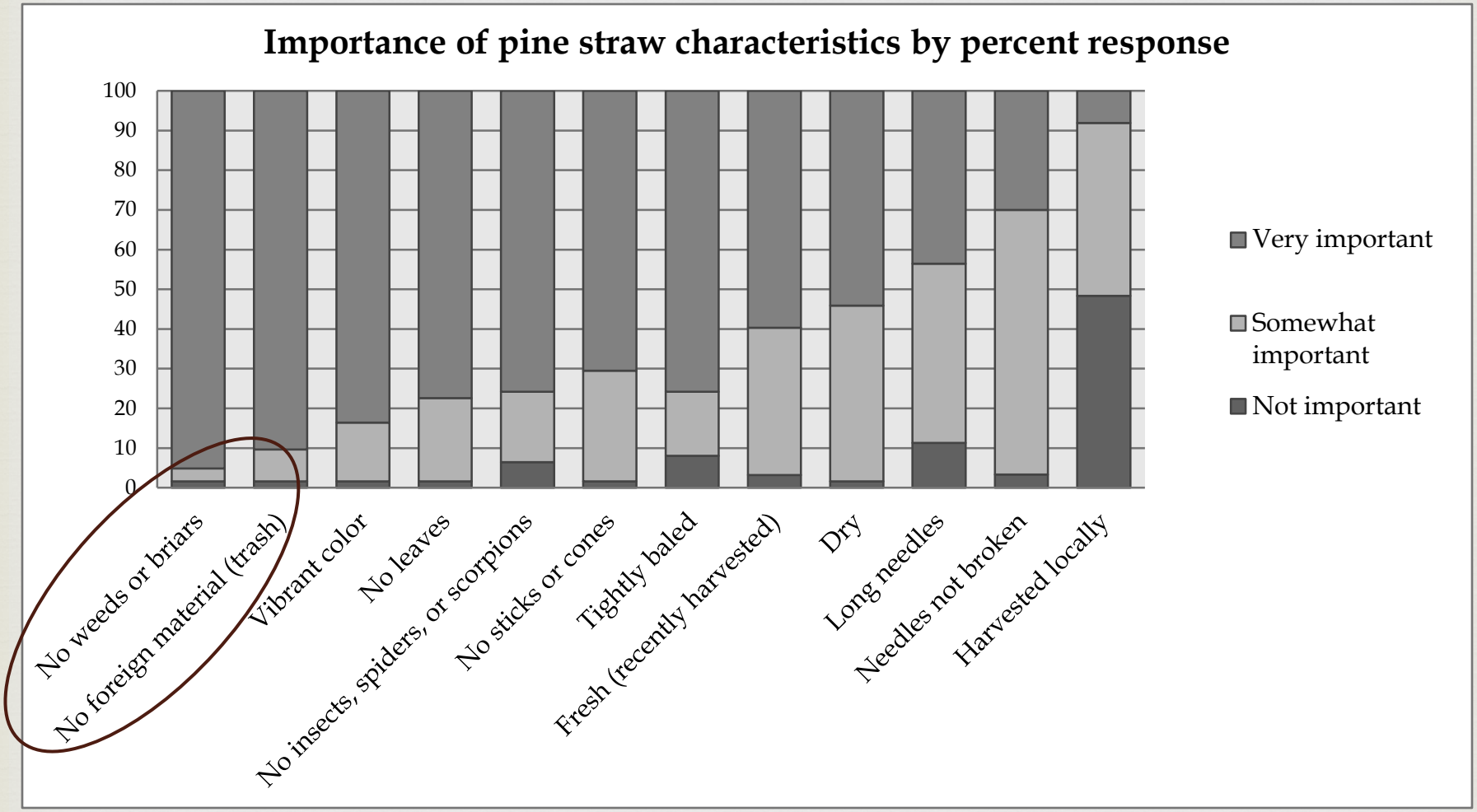


Baling Method



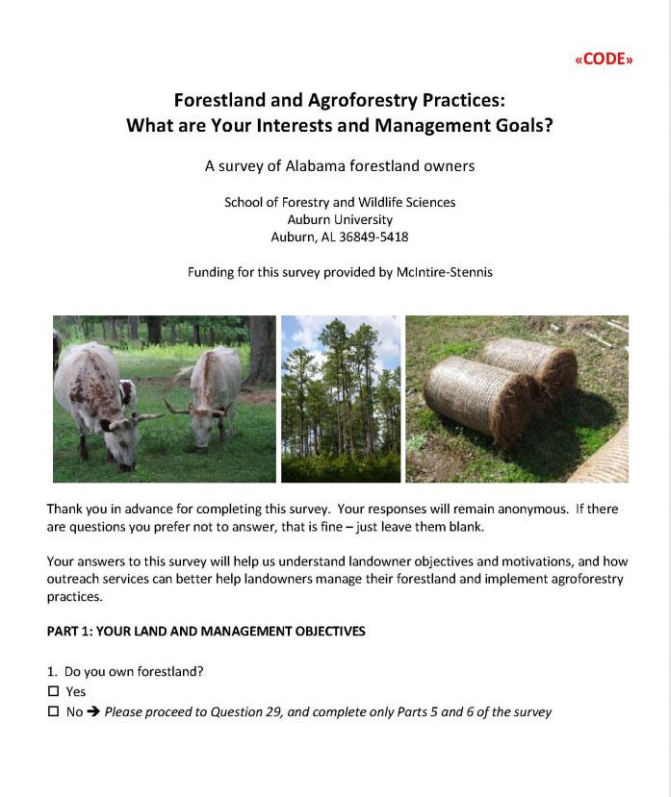
Bale Binding

Pine Straw Characteristics



Landowner Survey

- 6 Alabama counties
- 798 recipients (own ≥ 10 acres)
- 282 valid responses, 197 own forestland



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Forestland and Agroforestry Practices:
What are Your Interests and Management Goals?

A survey of Alabama forestland owners

School of Forestry and Wildlife Sciences
Auburn University
Auburn, AL 36849-5418

Funding for this survey provided by McIntire-Stennis

Thank you in advance for completing this survey. Your responses will remain anonymous. If there are questions you prefer not to answer, that is fine – just leave them blank.

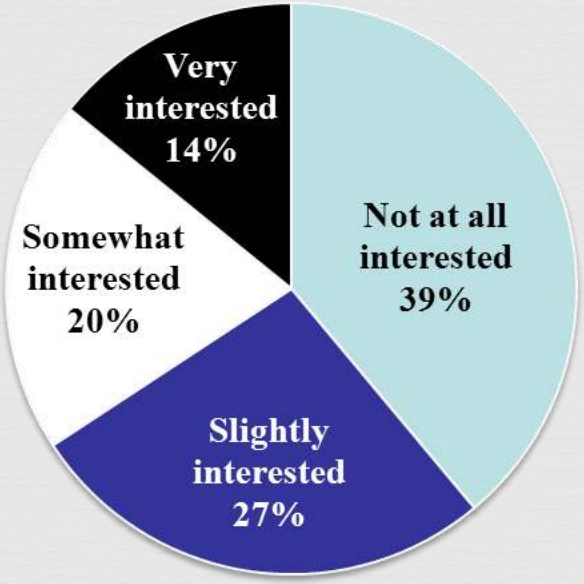
Your answers to this survey will help us understand landowner objectives and motivations, and how outreach services can better help landowners manage their forestland and implement agroforestry practices.

PART 1: YOUR LAND AND MANAGEMENT OBJECTIVES

1. Do you own forestland?
☐ Yes
☐ No → *Please proceed to Question 29, and complete only Parts 5 and 6 of the survey*

Who's (most) interested in pine straw production?

Approximately 60% of pine forest owners in Alabama expressed at least some level of interest in harvesting their pine straw



Who's (most) interested in pine straw production?

- Own larger acreages …
  - of all species (combined)
  - of natural pine
  - of planted pine
  - of planted loblolly
  - of planted longleaf
  - of planted slash
- Used a consulting forester in past 10 years
- Live **outside** the county where forestland is

What are their concerns?

- Those with high interest in pine straw also expressed concern about …
  - lack of market
  - lack of information
  - maintenance costs
  - investment costs
  - lack of cost-share programs
  - lack of demonstration sites
  - competition between components
  - equipment needs

How much revenue is expected?

Most are willing to accept (WTA) ~$0.50-$1.00 per bale

Response frequencies for WTA question (N=77)		
	N	Percent
$0.05/bale = $6.25/acre	0	0
$0.10/bale = $12.50/acre	1	1.3
$0.15/bale = $18.75/acre	1	1.3
$0.20/bale = $25.00/acre	0	0
$0.25/bale = $31.25/acre	1	1.3
$0.35/bale = $43.50/acre	4	5.2
$0.50/bale = $62.50/acre	16	20.8
$0.75/bale = $93.75/acre	11	14.3
$1.00/bale = $125.00/acre	34	41.6
$1.50/bale = $187.50/acre	11	14.3

What influences this?

- No statistically significant relationships observed between WTA and
  - landowner location
  - species owned
  - acreage owned
- This suggests that landowners are NOT well-informed about the pine straw market
- However, those who live in the same county as their land expect higher prices

Getting started

- What species is growing?
- Lay of the land?
- Preparing the site
- How will it be raked
- How often will it be raked - intensity of harvest?
- To fertilize or not to fertilize?
- To burn or not to burn?

For more information:
Harvesting pine straw for profit: Questions landowners should ask themselves
http://www.aces.edu/pubs/docs/A/ANR-1418/index2.tmpl

Considering the economics- An example for pine straw

Year	Activity	Example Cost/acre	Example Revenue/acre
0	Site prep	$168.00	
0	Planting	$165.00	
3	Herbicide	$45.00	
Annual	Management	$17.00	
Annual	Taxes	$3.25	
15	Thinning		$189.00
25	Thinning		$384.00
35	Final harvest		$1089.00

Considering the economics- An example (4% rate of return)

Net Present Value					
	Present Value Revenues			Present Value Expense	
Thinnings	$	248.99	*Site Prep*	$	168.00
Leases	$	-	*Planting*	$	165.00
Pine Straw	$	-	*Prescribed Burning*	$	-
Cost Share	$	-	*Pre-Commercial Thin*	$	-
Final Harvest	$	275.97	*Fertilizer*	$	-
			Herbicide Treatment	$	40.00
			Management Costs	$	312.99
			Taxes	$	60.66
Total	$	524.96	*Total*	$	746.66

NPV ($/Per Acre)
-$221.70
NPV ($/Total Tract)
-$6,650.88

Land Expectation Value
LEV ($/Acre)
-$296.95
LEV ($/Tract)
-$8,908.40

Benefit/Cost Ratio
0.70

Considering the economics- An example (2% rate of return)

Net Present Value					
	Present Value Revenues			Present Value Expense	
Thinnings	$	374.49	*Site Prep*	$	168.00
Leases	$	-	*Planting*	$	165.00
Pine Straw	$	-	*Prescribed Burning*	$	-
Cost Share	$	-	*Pre-Commercial Thin*	$	-
Final Harvest	$	544.53	*Fertilizer*	$	-
			Herbicide Treatment	$	42.40
			Management Costs	$	416.48
			Taxes	$	81.25
Total	$	919.02	*Total*	$	873.13

NPV ($/Per Acre)
$45.89
NPV ($/Total Tract)
$1,376.81

Land Expectation Value
LEV ($/Acre)
$91.79
LEV ($/Tract)
$2,753.77

Benefit/Cost Ratio
1.05

Considering the economics- An example with pine straw & herbicide

Year	Activity	Example Cost/acre	Example Revenue/acre
0	Site prep	$168.00	
0	Planting	$165.00	
3, 6, & 9	Herbicide	$45.00	
Annual	Management	$17.00	
Annual	Taxes	$3.25	
10-15	Pine straw		$100.00
15	Thinning		$189.00
25	Thinning		$384.00
35	Final harvest		$1089.00

Considering the economics-
An example with pine straw & herbicide
(4% rate of return)

Net Present Value			
	Present Value Revenues		Present Value Expense
Thinnings	$ 248.99	*Site Prep*	$ 168.00
Leases	$ -	*Planting*	$ 165.00
Pine Straw	$ 300.75	*Prescribed Burning*	$ -
Cost Share	$ -	*Pre-Commercial Thin*	$ -
Final Harvest	$ 275.97	*Fertilizer*	$ -
		Herbicide Treatment	$ 107.19
		Management Costs	$ 312.99
		Taxes	$ 60.66
Total	$ 825.71	*Total*	$ 813.84

NPV ($/Per Acre)
$11.87
NPV ($/Total Tract)
$356.18

Land Expectation Value
LEV ($/Acre)
$15.90
LEV ($/Tract)
$477.08

Benefit/Cost Ratio
1.01

Considering the economics-
An example with pine straw & herbicide
(2% rate of return)

Net Present Value			
	Present Value Revenues		Present Value Expense
Thinnings	$ 374.49	*Site Prep*	$ 168.00
Leases	$ -	*Planting*	$ 165.00
Pine Straw	$ 386.67	*Prescribed Burning*	$ -
Cost Share	$ -	*Pre-Commercial Thin*	$ -
Final Harvest	$ 544.53	*Fertilizer*	$ -
		Herbicide Treatment	$ 120.02
		Management Costs	$ 416.48
		Taxes	$ 81.25
Total	$ 1,305.69	*Total*	$ 950.74

NPV ($/Per Acre)
$354.95
NPV ($/Total Tract)
$10,648.46

Land Expectation Value
LEV ($/Acre)
$709.94
LEV ($/Tract)
$21,298.10

Benefit/Cost Ratio
1.37

Considering the economics- An example with pine straw & fire

Year	Activity	Example Cost/acre	Example Revenue/acre
0	Site prep	$168.00	
0	Planting	$165.00	
2	Herbicide	$45.00	
3,5,7,9,12,15, 18,21,24,27, 30,33	Prescribed fire	$35.00	
Annual	Management	$17.00	
Annual	Taxes	$3.25	
10-15	Pine straw		$100.00
15	Thinning		$189.00
25	Thinning		$384.00
35	Final harvest		$1089.00

Considering the economics-
An example with pine straw & herbicide
(4% rate of return)

Net Present Value					
	Present Value Revenues			Present Value Expense	
Thinnings	$	248.99	*Site Prep*	$	168.00
Leases	$	-	*Planting*	$	165.00
Pine Straw	$	300.75	*Prescribed Burning*	$	231.18
Cost Share	$	-	*Pre-Commercial Thin*	$	-
Final Harvest	$	275.97	*Fertilizer*	$	-
			Herbicide Treatment	$	-
			Management Costs	$	312.99
			Taxes	$	60.66
Total	$	825.71	*Total*	$	937.83

NPV ($/Per Acre)
-$112.12
NPV ($/Total Tract)
-$3,363.61

Land Expectation Value
LEV ($/Acre)
-$150.18
LEV ($/Tract)
-$4,505.34

Benefit/Cost Ratio
0.88

Considering the economics-
An example with pine straw & herbicide
(2% rate of return)

Net Present Value			
	Present Value Revenues		Present Value Expense
Thinnings	$ 374.49	*Site Prep*	$ 168.00
Leases	$ -	*Planting*	$ 165.00
Pine Straw	$ 386.67	*Prescribed Burning*	$ 305.43
Cost Share	$ -	*Pre-Commercial Thin*	$ -
Final Harvest	$ 544.53	*Fertilizer*	$ -
		Herbicide Treatment	$ -
		Management Costs	$ 416.48
		Taxes	$ 81.25
Total	$ 1,305.69	*Total*	$ 1,136.16

NPV ($/Per Acre)
$169.53
NPV ($/Total Tract)
$5,085.95

Land Expectation Value
LEV ($/Acre)
$339.08
LEV ($/Tract)
$10,172.46

Benefit/Cost Ratio
1.15

Potential drawbacks

- Impact on soil and water resources
- Wildlife habitat

Potential benefits

- Compatible with many land uses
- Primary or secondary product
- Opportunities to actively manage lands after CRP program contract expires
- Lease options
  - Understory improvement
  - Per-bale
  - Per-acre

The time is right to consider the responsible management of NTFPs like pine straw

Realizing the potential

Remember to weigh the options!

- Must always consider objectives when planning a new NTFP activity
- Think about what it will take to get your land in shape!
- Consider the economics
- It is important that landowners and land managers understand the ecology and management of any species
  - Differences may impact their land management decisions

Thank you!