

Cost Analysis of Labor Saving Strategies in Tobacco Production

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Outline

- Tobacco Labor Research Project
- Methods
- Data Analysis
- Conclusion
- Comments or Questions?



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Introduction

- According to the 2008 Center of Tobacco Growers Research Survey, Flue-Cured tobacco has required an average of 100-125 hours of labor per acre.
- Through personal interviews with farmers across NC , we concluded that your average tobacco farms have reduced the labor hours to 80 hours per acre or less.
- Highly efficient farms as seen in this survey have decreased number of hours per acre to 50 hours and lower.

Project Objectives

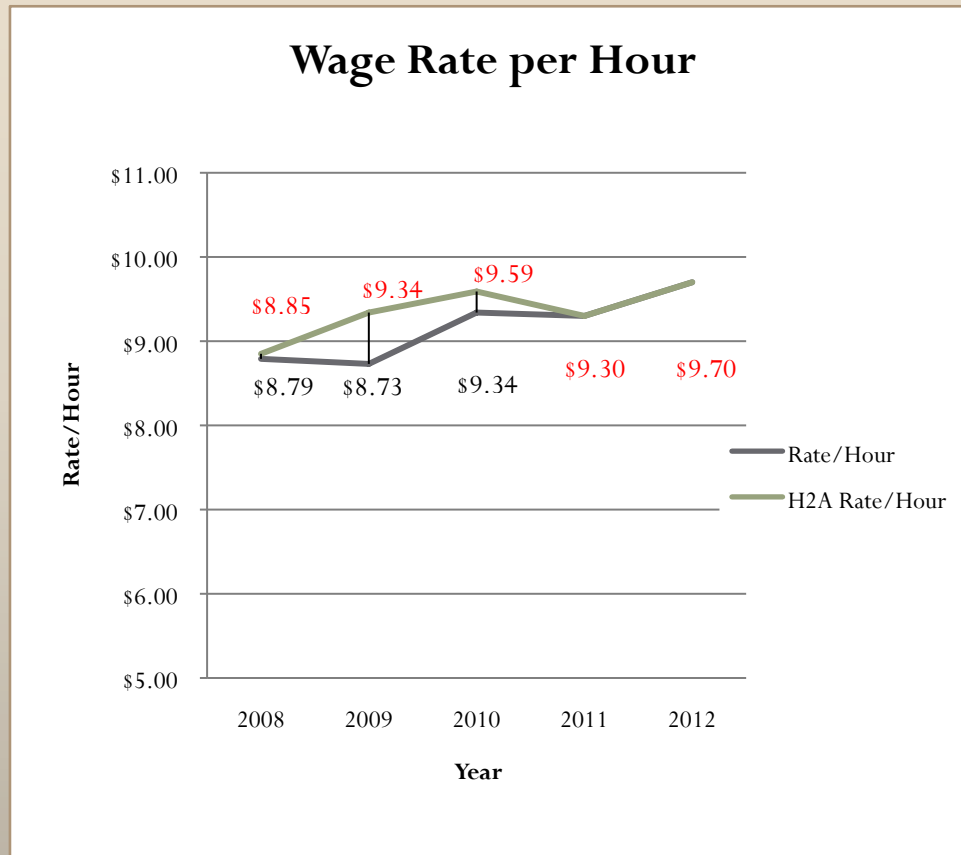
- Evaluate Labor cost over the past 4 years.
- Review Tobacco Equipment use and purchases.
- Determine production hours per acre.
- Look at cost on a *per hour* and *per acre* basis.



Total labor cost have increased consistently over the past 4 years.

- There was a **25%** labor cost increase from 2007-2010, with an average of 7.7% increase in labor cost each year.
- Largest increase from 2009-2010 with a 10.3% increase in labor cost.

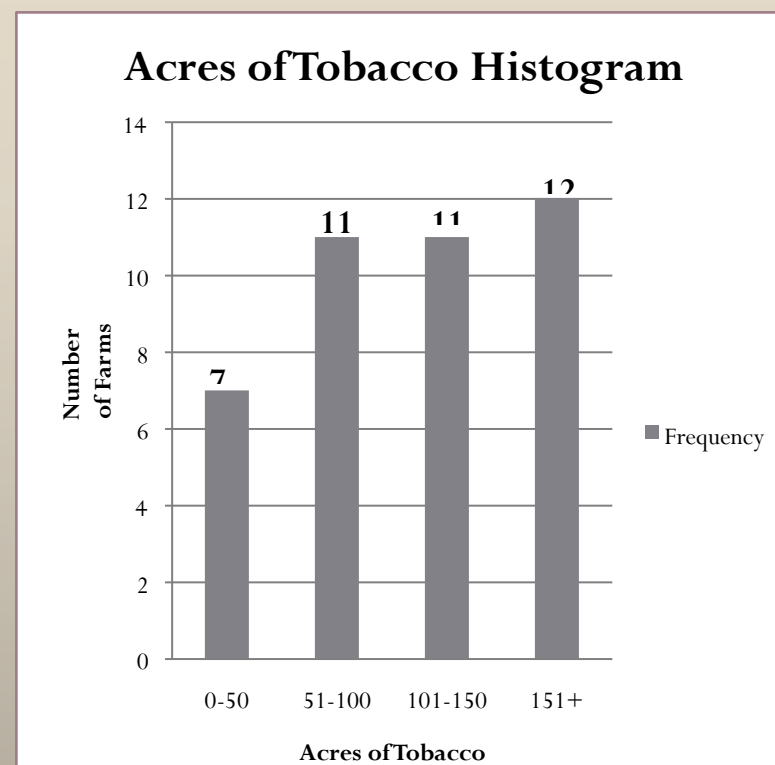
Yearly Wage Rate



- There is a 6.25% increase in wage rate from 2008-2010.

Survey Logistics

- Sent out approximately 600 surveys to 30 counties across North Carolina.
- Of those 600 about 60 (10%) were returned.
- Of those 60, 40 surveys had included the needed information.
- For surveys to be useable we needed 3 specific portions completed:
 - Total tobacco acreage over the past 4 years.
 - Number of hours in production per acre.
 - Total labor cost per year for last 4 years.

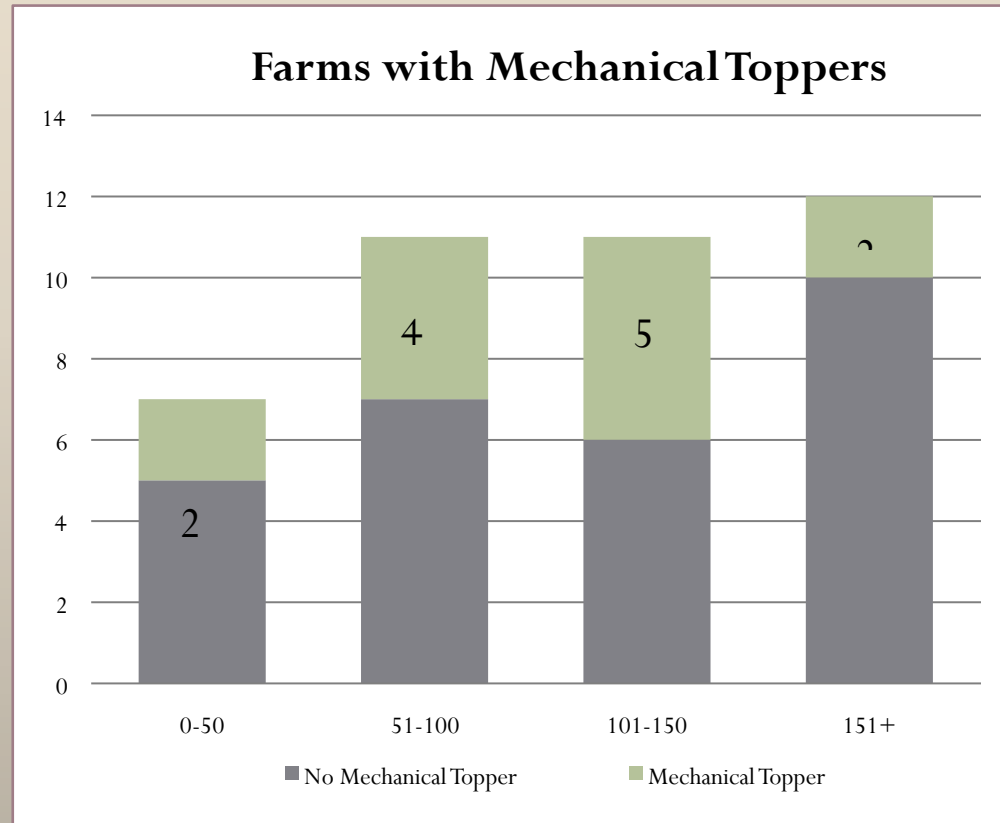


Equipment *usage* and *purchases*

- What equipment is being used?
- Number of farms in each acreage section that have or do not have the equipment.
- What percentage of farms are using the specific equipment?
- How recently have investments in equipment been made?

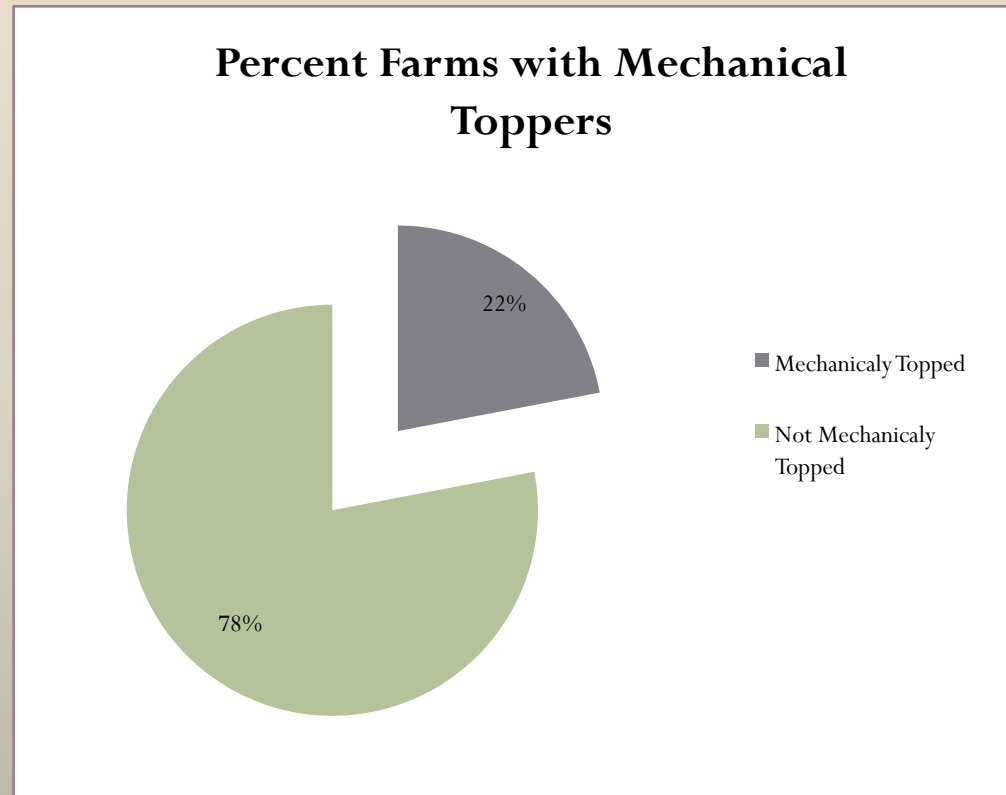
Mechanical Toppers

- Use of mechanical toppers have become less popular over the past 10 years.
- No acreage group has more than 50% of the farms that still have mechanical toppers.
- 2/3 of Toppers were bought *more* than 10 years ago.



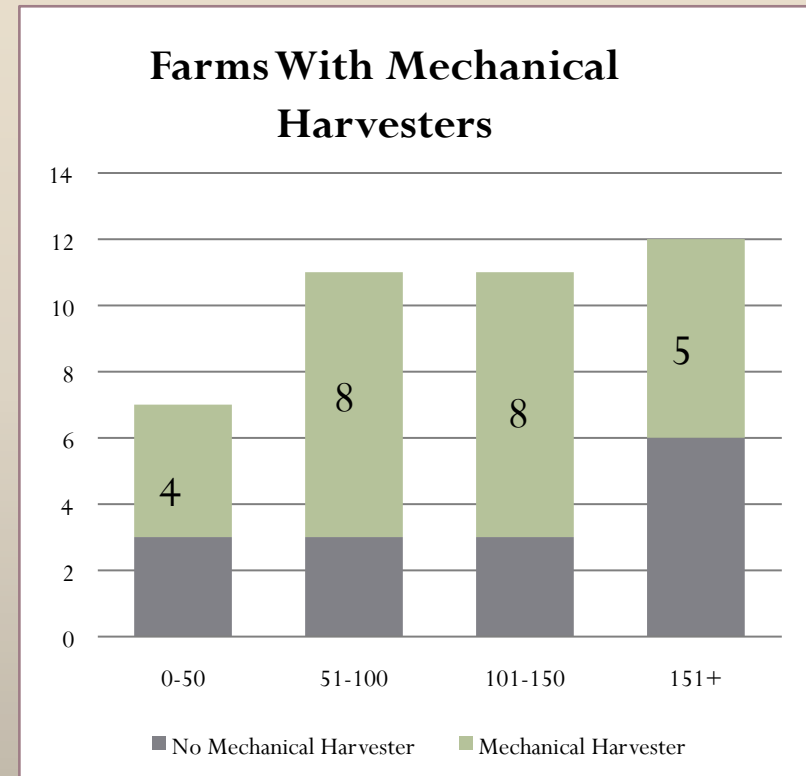
Mechanical Toppers

- Of the farms that have mechanical toppers an average of 68% of the crop is topped mechanically.
- Possibility that farmers are getting better results in long term sucker control from letting workers remove a flower on every plant.
- Topper values range from \$300-\$6,000 with an average value of \$2,233.



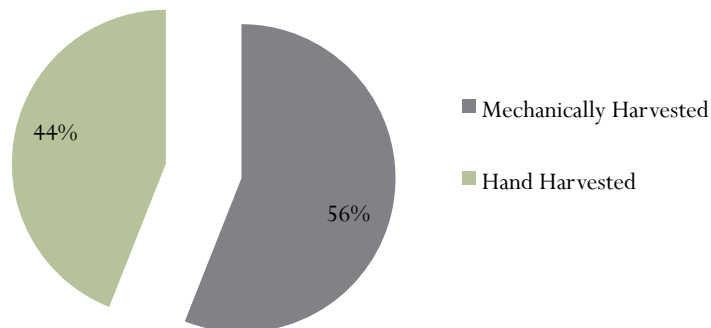
Mechanical Harvesters

- 1/2 of all harvesters purchased were bought in the last 10 years.
- 80% of all harvesters purchased were bought in the last 15 years



Mechanical Harvesters

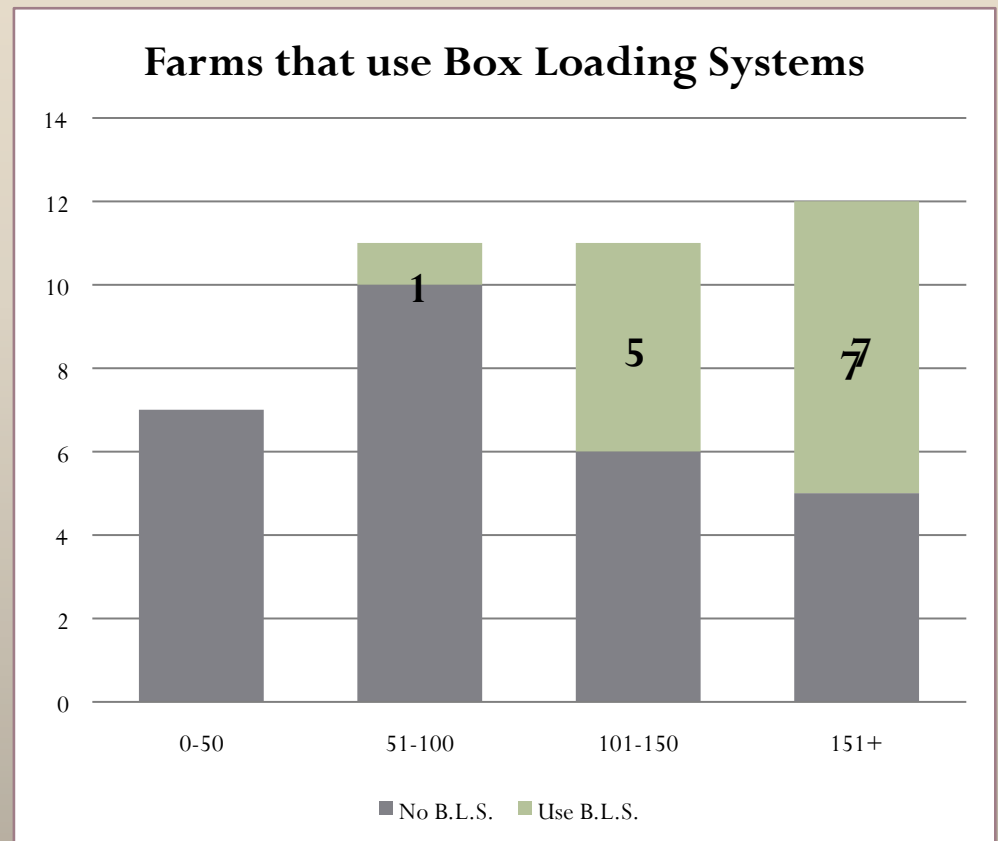
Percent of Farms with Mechanical Harvesters



- Of the farms that have mechanical Harvesters an average of 90% of the crop is harvested mechanically.
- Harvester values range from \$5,000-125,000 with an average value of \$30,773.

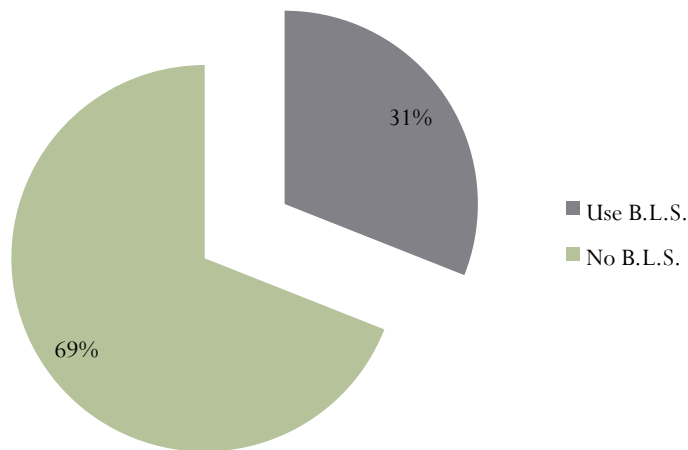
Box Loading Systems

- 100% of all B.L.S. purchased were bought in the last 10 years.
- 70% of all B.L.S. purchased were bought in the last 5 years.
- See a growing trend especially in farms with 151+ Acres.
- As used systems become available smaller farms may adapt this technology.



Box Loading Systems

Percentage of Farms with Box Loading Systems



- Value Range of Box Loading Systems from \$3,000-25,000
- Average Value of is \$16,182



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Curing Barns

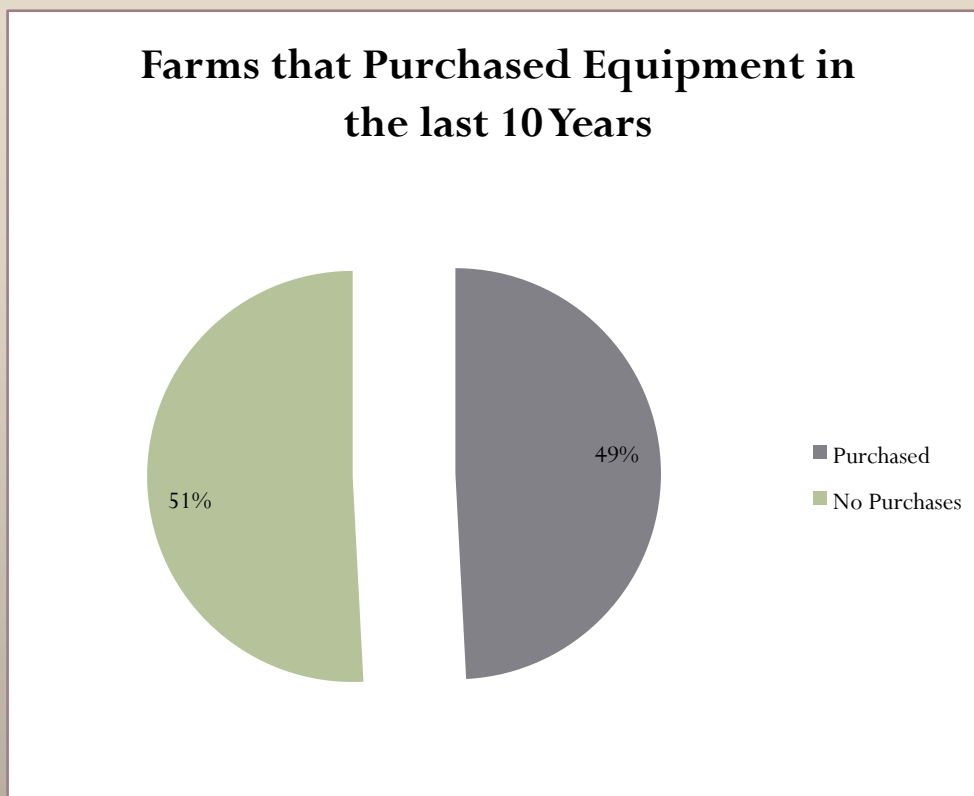
- No standard in curing barns.
- Functioning barns have been purchased as far back as 40 years and as new as 2011.
- View barn rental, only 12% of respondents rent curing barn space.
- Of those 12% that rent; 60% of them rent more than 50% of the total number of barns used for their operation.



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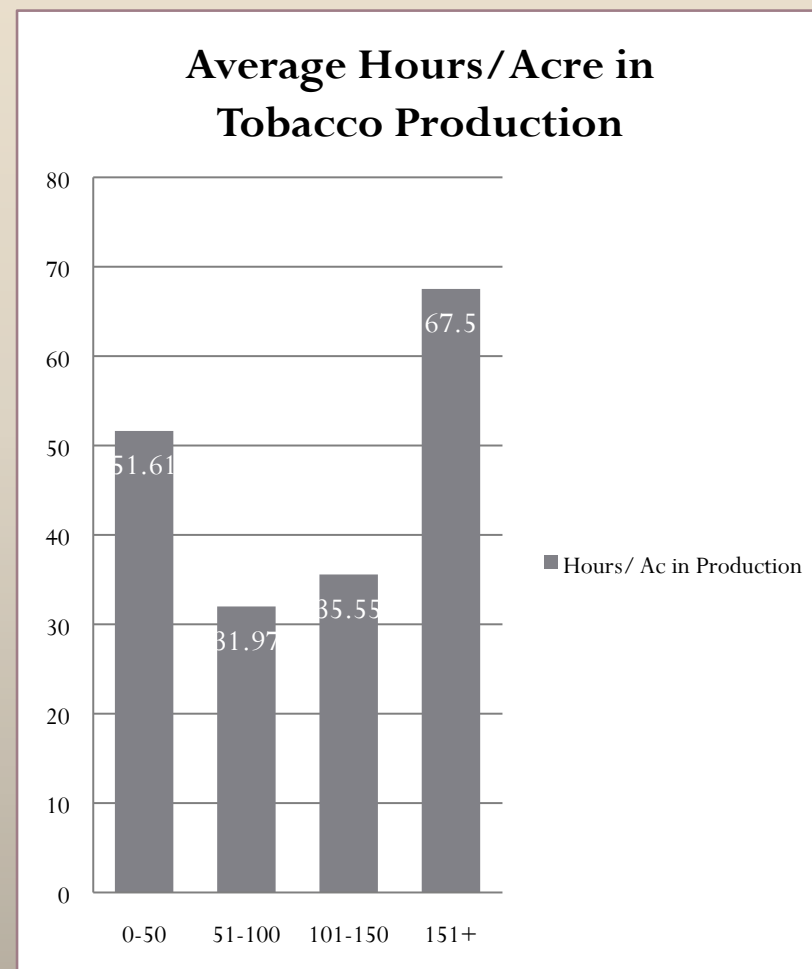
Capital Equipment Investments

- Only 49% have purchased tobacco equipment in the past 10 years.
- Of the farms that purchased equipment in the past 10 years, 75% of those same people purchased equipment in the last 5 years.



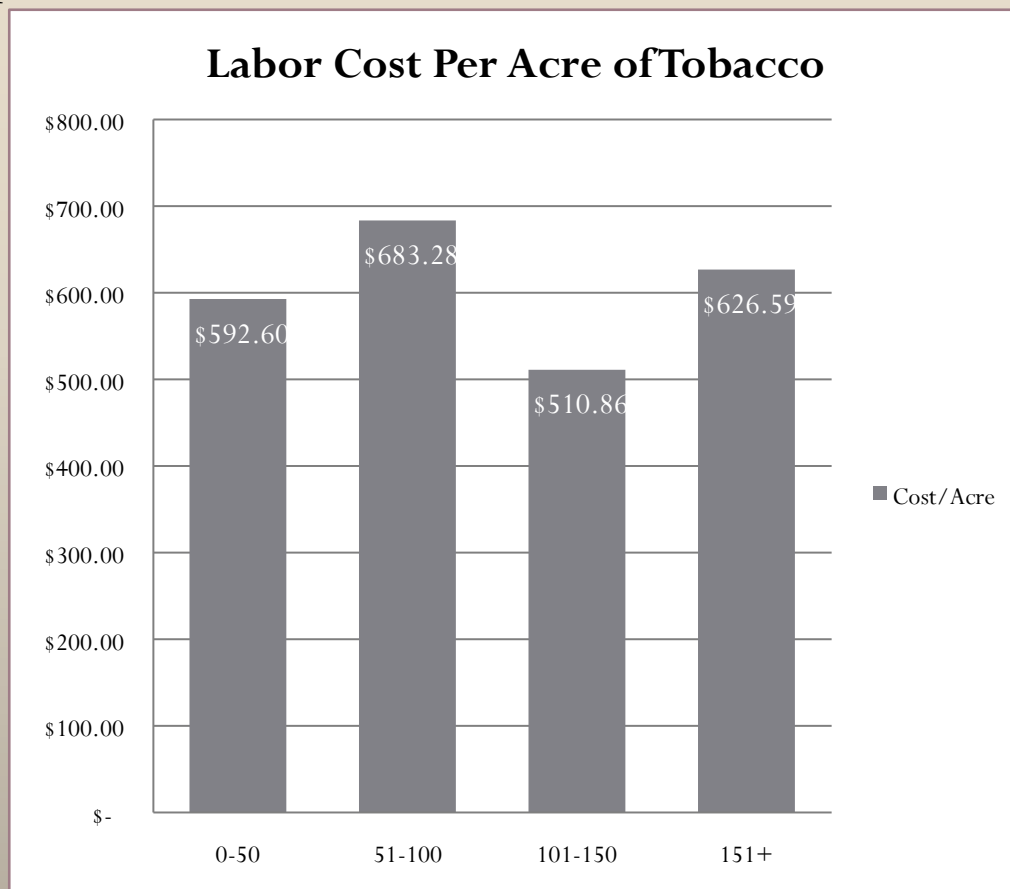
Production Hours

- Most efficient production range in the 51-100 and 101-150 acres of tobacco sections.
- The 0-50, 51-100, and 101-150 Acre Sections are well below the number of labor hours allocated in the NCSU 2012 Tobacco Budgets.
- The 151+ Acre section is closest to the allocated labor hours in the NCSU 2012 Tobacco Budgets



Cost Per Acre

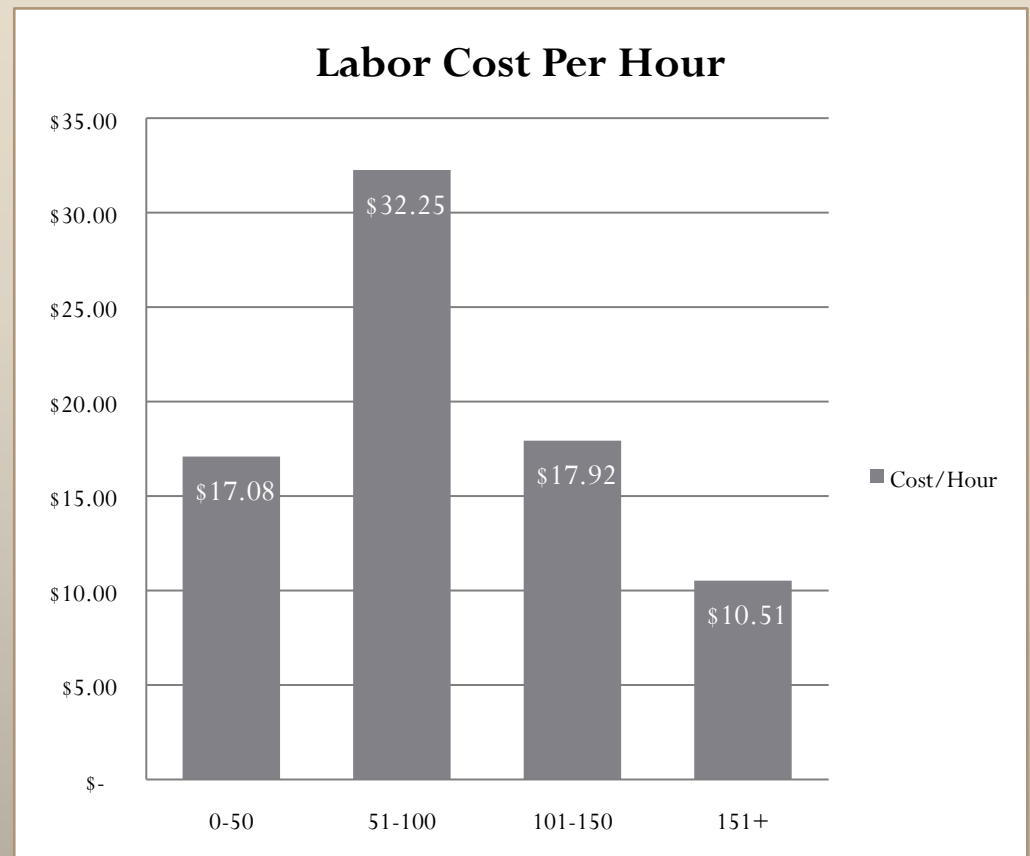
- Average total labor cost per acre of \$592.08.
- Approximately \$100 less than the allotted labor cost per acre.



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Hourly Labor Cost

- Average cost per hour of tobacco production is approximately \$19.50/Hr.
- Largest farms may have lower cost due to better utilization of each individual worker.
- The 51-100 Acre group is almost double the per hour labor cost but this could be due to the respondents in the category.



Production Hours vs. Equipment Investments

- Farms that require less than 79 hours/acre of tobacco production have an average equipment value of \$42,106.
- Farms that require more than 79 hours/acre of tobacco production have an average equipment value of \$19,000.
- These equipment values do not include the value of curing barns.



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FLUE-CURED TOBACCO-MACHINE HARVEST EAST-2012

ESTIMATED COSTS PER ACRE, 2012

	UNIT	QUANTITY	PRICE OR COST/UNIT	TOTAL PER ACRE	YOUR FARE
GROSS RECEIPTS					
Stalk Position		Yield	Price/LBS		
Lugs	LBS	0.00	\$0.00	\$0.00	
Cutter	LBS	0.00	\$0.00	\$0.00	
Leaf	LBS	0.00	\$0.00	\$0.00	
Tips	LBS	0.00	\$0.00	\$0.00	
TOTAL RECEIPTS:				\$0.00	
2. VARIABLE COSTS					
PLANTS (GREENHOUSE)	THOU.	6.20	\$34.50	\$213.90	
MULTIPURPOSE FUMIGATION	GAL	10.50	\$17.13	\$179.87	
FERTILIZER					
8-9-24	CWT	5.00	\$30.63	\$153.15	
24S LIQUID	CWT	1.60	\$14.13	\$22.61	
LIME (PRORATED)	TON	0.33	\$48.50	\$16.01	
HERBICIDES	ACRE	1.00	\$51.17	\$51.17	
INSECTICIDES	ACRE	1.00	\$54.58	\$54.58	
SUCKER CONTROL	ACRE	1.00	\$186.32	\$186.32	
HAULING	LBS	2400.00	\$0.04	\$96.00	
COVER CROP	ACRE	1.00	\$20.00	\$20.00	
CURING FUEL	GAL	325.00	\$1.75	\$568.75	
ELECTRICITY	KWH	1580.00	\$0.08	\$126.40	
CROP INSURANCE	DOL	1.00	\$120.00	\$120.00	
BALING SUPPLIES	DOL	2400.00	\$0.003	\$7.20	
TRACTORMACHINERY	ACRE	1.00	\$233.94	\$233.94	
LABOR					
PRE HARVEST	HRS	46.25	\$9.30	\$430.13	
HARVEST/BAILING	HRS	23.54	\$9.30	\$218.92	
POST HARVEST	HRS	9.00	\$9.30	\$83.70	
INTEREST ON OP. CAP.	DOL	\$555.78	5.0%	\$27.79	
TOTAL VARIABLE COSTS:				\$2,610.44	
3. INCOME ABOVE VARIABLE COSTS:					
4. FIXED COSTS					
TRACTORMACHINERY	ACRE	1.00	\$224.03	\$224.03	
BULK BARN	ACRE	1.00	\$132.58	\$132.58	

Comparing just the Harvest/Baling Labor categories in the Mechanical and Manual Flue-Cured Tobacco Budgets a farm can save up to **36.06 hours** per acre by operating automatic harvesters.

LABOR

PRE HARVEST	HRS	46.25	\$9.30	\$430.13
HARVEST/BAILING	HRS	23.54	\$9.30	\$218.92
POST HARVEST	HRS	9.00	\$9.30	\$83.70

FLUE-CURED TOBACCO-HAND HARVEST PIEDMONT - 2012

ESTIMATED COSTS PER ACRE, 2012

	UNIT	QUANTITY	PRICE OR COST/UNIT	TOTAL PER ACRE	YOUR FARE
GROSS RECEIPTS					
Stalk Position		Yield	Price/LBS		
Lugs	LBS	0.00	\$0.00	\$0.00	
Cutter	LBS	0.00	\$0.00	\$0.00	
Leaf	LBS	0.00	\$0.00	\$0.00	
Tips	LBS	0.00	\$0.00	\$0.00	
TOTAL RECEIPTS:				\$0.00	
2. VARIABLE COSTS					
PLANTS (GREENHOUSE)	THOU.	6.20	\$34.50	\$213.90	
MULTIPURPOSE FUMIGATION	GAL	10.50	\$17.13	\$179.87	
FERTILIZER					
6-6-18	LBS	665.00	\$0.27	\$179.55	
15-0-0-0	LBS	200.00	\$0.25	\$50.00	
LIME (PRORATED)	TON	0.33	\$48.50	\$16.01	
HERBICIDES	ACRE	1.00	\$51.17	\$51.17	
INSECTICIDES	ACRE	1.00	\$52.85	\$52.85	
SUCKER CONTROL	ACRE	1.00	\$186.32	\$186.32	
HAULING	LBS	2500.00	\$0.04	\$100.00	
COVER CROP	ACRE	1.00	\$20.00	\$20.00	
CURING FUEL	GAL	325.00	\$1.75	\$568.75	
ELECTRICITY	KWH	1580.00	\$0.08	\$126.40	
CROP INSURANCE	DOL	1.00	\$120.00	\$120.00	
IRRIGATION	CYCLE	3.00	\$80.01	\$240.03	
BALING SUPPLIES	DOL	2500.00	\$0.003	\$7.50	
TRACTORMACHINERY	ACRE	1.00	\$157.14	\$157.14	
LABOR					
PRE HARVEST	HRS	46.25	\$9.30	\$430.13	
HARVEST/BAILING	HRS	59.60	\$9.30	\$554.28	
POST HARVEST	HRS	9.00	\$9.30	\$83.70	
INTEREST ON OP. CAP.	DOL	\$555.81	5.0%	\$27.79	
TOTAL VARIABLE COSTS:				\$3,390.19	
3. INCOME ABOVE VARIABLE COSTS:					
4. FIXED COSTS					
TRACTORMACHINERY	ACRE	1.00	\$98.63	\$98.63	

LABOR

PRE HARVEST	HRS	46.25	\$9.30	\$430.13
HARVEST/BAILING	HRS	59.60	\$9.30	\$554.28
POST HARVEST	HRS	9.00	\$9.30	\$83.70

Conclusion

- Assume: **Mechanical harvesters production**
 - 4.5 Ac per Barn; harvesting 4 barns per day = 18 Ac per day.
 - Labor includes: 2 harvester operators, 4 truck/trailer drivers, and 6 workers at the curing barns.
 - Work is for 8 hours each day: 12 total workers = 96 total hours per day.

- Assume: **Manual Hand Harvest**
 - 5 Ac per Barn; harvesting 2 barns per day = 10 Ac per day.
 - Labor includes: 8 workers priming, 3 truck/trailer drivers, and 7 workers at the curing barns.
 - Work is for 8 hours each day: 18 total workers = 144 total hours per day.

Conclusion Continued

- Total Manual Labor Hours – Total Mechanical Labor Hours; 144 hours – 96 hours = 48 hours day
- Save 48 hours per day by using Mechanical Harvesters which gives an average savings of \$446.4 per day (48 hrs * \$9.3=\$446.4)
- The average value of Mechanical Harvesters as determined through survey = \$30,733
- Operate 2 harvesters at average fixed cost of \$61,466 ($\$30,733 * 2$)
- $\$61,466 / (446.4 * 40) = 3.44$ years to recoup fixed cost from saving on **JUST** labor hours.

The Next Step

- Need a larger data set.
- Can be completed by more in-person interviews with tobacco farmers.
- Would allow this project to have verifiable numbers for use by extension agents and farmers.

THANK YOU

- Tobacco Research Commission
- Gary Bullen and Dr. Loren Fisher
- NC Crop Extension Specialists
- NC Tobacco Growers

QUESTIONS and COMMENTS?