

Impact of Lower Leaf Removal and Fungicide Application on Cigar Wrapper Leaf Production in Connecticut Broadleaf

**Caleb H. Perkins, James C. Rodgers, Mitchell D. Richmond, Robert L. Ellis,
and William A. Bailey**

University of Kentucky & University of Tennessee



Photo credited to Miranda Rudolph

Research History

- Increase in demand for air cured cigar wrapper tobacco.
- Dealers urged Kentucky and Tennessee producers to try and meet demand Connecticut could not meet.
- Lower Leaf Removal Trials: 2021-2023
 - Evaluate lower leaf removal to improve wrapper production in Connecticut Broadleaf
- Research locations:
 - University of Kentucky Research and Education Center in Princeton, KY (2021)
 - Private farm in Mayfield, KY (2022-2023)
 - Highland Rim Research Station in Springfield, TN (2021-23)

Field and Experimental Design Details

- 2021: University of Kentucky Research and Education Center in Princeton, KY. Transplant date: May 25, 2021
- 2022-23: Private farm near Mayfield, KY, and Highland Rim Research & Education Center in Springfield, TN.
Transplant dates: May 14, 2022, May 25, 2023, and June 1, 2022, May 4, 2023, respectively.
- Plot sizes were 40 feet long and four rows wide, with a row spacing of 40 inches and in-row plant spacing of 32 inches, with a plant population of 4,901 plants/ac. At Springfield four row plots were 40 feet long with a row spacing of 40 inches and in-row plant spacing of 24 inches, giving a plant population of 6,534 plants/acre.
- Plots set up in a randomized complete block design with four replications.
- The variety used for both years of testing was a selection of a standard Connecticut Broadleaf variety known as ‘C33’.

Lower Leaf Trial Application Details

- 2022 and 2023 treatment design: 4-by-2 factorial with leaf removal at four levels with and without fungicide
 - No lower leaf removal, with and without fungicide
 - Lower leaf removal at layby (5 wk post-transplant), with and without fungicide
 - Lower leaf removal or topping (7 wk post-transplant), with and without fungicide
 - No lower leaf removal, but harvesting only the top eight leaves on the plant, with and without fungicide
- In 2022 and 2023, all plants were topped to 12 leaves.

Treatments for Lower Leaf Removal Trial, 2022 & 2023

Lower Leaves Removed	Removal Timing	Fungicide Application	Application Timing	Fungicide Rate ^a
None	None	None	-	-
None	None	Quadris Double Nickel LC	Topping 3 d-PHI	8 fl oz/ac 2 qt/ac
4 Lower Leaves	Layby	None	-	-
4 Lower Leaves	Layby	Quadris Double Nickel LC	Topping 3 d-PHI	8 fl oz/ac 2 qt/ac
4 Lower Leaves	Topping	None	-	-
4 Lower Leaves	Topping	Quadris Double Nickel LC	Topping 3 d-PHI	8 fl oz/ac 2 qt/ac
Upper Stalk Harvest (8 leaves) ^b	None	None	-	-
Upper Stalk Harvest (8 leaves) ^b	None	Quadris Double Nickel LC	Topping 3 d-PHI	8 fl oz/ac 2 qt/ac

^a Fungicide applications were made at a volume of 40 gal/ac

^b Treatments were not included at Springfield in 2022



Lower Leaf Removal at Layby



Upper Stalk Harvest



Lower Leaf Removal at Topping

Leaf Removal at Topping



Photo credited to Eliza Simons

Photo credited to Eliza Simons

Harvest Details

- Harvesting took place approximately 9-10 weeks after transplanting.
- Tobacco was allowed to field wilt until leaves were pliable enough to withstand spiking.
- Six plants were spiked onto each stick and evenly spaced on sticks (five sticks per plot).
- After spiking, plants were loaded onto scaffold wagons and transported to a standard air curing barn.
- Tobacco was then housed at 12” stick spacing on the tier rails and allowed to air cure.



Wrapper Grading Specifications

- Wrapper ‘cuts’ used in grading are approximately three inches in width and five inches in length.
- Tobacco leaves were evaluated to be placed into five grades
 - Trash (\$0.40/lb)
 - Filler (\$1.40/lb)
 - #3 (\$3.00/lb)
 - #2 (\$4.50/lb)
 - #1 (\$6.85/lb)
- Trash grade have no area on the leaf that can produce a wrapper cut.
- Filler grade are leaves that can produce one wrapper cut.
- #3 grade (two-cut), have two or three wrapper cuts within the leaf.
- #2 grade (binder), have four or five wrapper cuts within the leaf.
- #1 grade (wrapper), have six or more wrapper cuts within the leaf.



Effects of Treatment on Total Yield/Acre^a 2022 & 2023 (Mayfield, KY)

Treatment	Total Yield lbs/ac (2022)	Total Yield lbs/ac (2023)
No Lower Leaf Removal, No Fungicide	1,363 a	1,838 ab
No Lower Leaf Removal, Fungicide	1,307 ab	1,738 abc
Lower Leaf Removal at Layby, No Fungicide	1,309 ab	1,793 ab
Lower Leaf Removal at Layby, Fungicide	1,310 ab	1,571 bcd
Lower Leaf Removal at Topping, No Fungicide	1,193 b	2,023 a
Lower Leaf Removal at Topping, Fungicide	1,242 ab	1,689 abc
Upper Stalk Harvest, No Fungicide	1,026 c	1,303 cd
Upper Stalk Harvest, Fungicide	959 c	1,182 d
<i>P-value</i>	<i>0.0010</i>	<i>0.0515</i>

Data followed by the same letter are not statistically different accorded to LSD, alpha=0.10

^aTotal yield is the sum of trash, filler, and all wrapper grades.

Effects of Treatment on Total Wrapper Pounds^a 2022 & 2023 (Mayfield, KY)

Treatment	Total Wrapper lbs/ac (2022)	Total Wrapper lbs/ac (2023)
No Lower Leaf Removal, No Fungicide	840	1,387
No Lower Leaf Removal, Fungicide	916	1,180
Lower Leaf Removal at Layby, No Fungicide	972	1,305
Lower Leaf Removal at Layby, Fungicide	852	1,363
Lower Leaf Removal at Topping, No Fungicide	1,021	1,584
Lower Leaf Removal at Topping, Fungicide	990	1,113
Upper Stalk Harvest, No Fungicide	775	1,157
Upper Stalk Harvest, Fungicide	780	1,072
<i>P-value</i>	0.5380	0.5781

Data followed by the same letter are not statistically different accorded to LSD, alpha=0.10

^aTotal wrapper is the sum of two-cut (#3 wrapper grade), binder (#2 binder grade), and wrapper (#1 wrapper grade) leaves.

Effects of Treatment on Total Gross Revenue^a 2022 & 2023 (Mayfield, KY)

Treatment	Total Revenue \$/ac (2022)	Total Revenue \$/ac (2023)
No Lower Leaf Removal, No Fungicide	3,595	5,702
No Lower Leaf Removal, Fungicide	3,715	4,798
Lower Leaf Removal at Layby, No Fungicide	3,735	4,800
Lower Leaf Removal at Layby, Fungicide	3,669	4,084
Lower Leaf Removal at Topping, No Fungicide	4,002	6,644
Lower Leaf Removal at Topping, Fungicide	3,938	4,574
Upper Stalk Harvest, No Fungicide	3,045	4,607
Upper Stalk Harvest, Fungicide	3,176	3,925
<i>P-value</i>	0.4920	0.2384

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^aTotal gross revenue is the sum of the value trash, filler, and all wrapper grades.

Effects of Treatment on Total Yield/Acre^a 2022 & 2023 (Springfield, TN)

Treatment	Total Yield lbs/ac (2022)	Total Yield lbs/ac (2023)
No Lower Leaf Removal, No Fungicide	1,696 ab	2,253 a
No Lower Leaf Removal, Fungicide	1,865 a	-
Lower Leaf Removal at Layby, No Fungicide	1,460 bc	2,051 ab
Lower Leaf Removal at Layby, Fungicide	1,310 c	2,038 ab
Lower Leaf Removal at Topping, No Fungicide	1,323 c	2,012 b
Lower Leaf Removal at Topping, Fungicide	1,368 bc	2,060 ab
Upper Stalk Harvest, No Fungicide	-	1,738 c
Upper Stalk Harvest, Fungicide	-	1,718 c
<i>P-value</i>	0.0860	0.0139

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^aTotal yield is the sum of trash, filler, and all wrapper grades.

Effects of Treatment on Total Wrapper Pounds^a 2022 & 2023 (Springfield, TN)

Treatment	Total Wrapper lbs/ac (2022)	Total Wrapper lbs/ac (2023)
No Lower Leaf Removal, No Fungicide	1,237	798
No Lower Leaf Removal, Fungicide	1,288	-
Lower Leaf Removal at Layby, No Fungicide	1,164	737
Lower Leaf Removal at Layby, Fungicide	1,123	236
Lower Leaf Removal at Topping, No Fungicide	1,133	586
Lower Leaf Removal at Topping, Fungicide	1,176	772
Upper Stalk Harvest, No Fungicide	-	608
Upper Stalk Harvest, Fungicide	-	673
<i>P-value</i>	0.4470	0.1361

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^aTotal wrapper is the sum of two-cut (#3 wrapper grade), binder (#2 binder grade), and wrapper (#1 wrapper grade) leaves.

Effects of Treatment on Total Gross Revenue^a 2022 & 2023 (Springfield, TN)

Treatment	Total Revenue \$/ac (2022)	Total Revenue \$/ac (2023)
No Lower Leaf Removal, No Fungicide	5,830 a	3,771
No Lower Leaf Removal, Fungicide	5,811 a	-
Lower Leaf Removal at Layby, No Fungicide	5,176 ab	3,445
Lower Leaf Removal at Layby, Fungicide	4,815 b	2,160
Lower Leaf Removal at Topping, No Fungicide	4,793 b	2,995
Lower Leaf Removal at Topping, Fungicide	5,209 ab	3,506
Upper Stalk Harvest, No Fungicide	-	2,884
Upper Stalk Harvest, Fungicide	-	3,057
<i>P-value</i>	0.0890	0.1478

Data followed by the same letter are not statistically different accorded to LSD, alpha=0.10

^aTotal gross revenue is the sum of the value trash, filler, and all wrapper grades.

Summary:

- There were no significant differences in wrapper pounds produced or revenue where lower leaves were removed.
- Significant decreases in yield were found in upper stalk harvest treatments with and without fungicides.
 - Treatments that received fungicide applications showed numerically lower yields, this is due to spray injury from Quadris.
- Lower leaf removal does appear to improve efficiency of harvesting, spiking, handling, and stripping.



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