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Influence of Topping and Harvest Management on the Evaluation of Data From Burley Tobacco Variety Trials

Bob Pearce, Jim Calvert, and Gary Palmer

Introduction

Tobacco producers are always interested in new tobacco varieties, and are continually searching for the "best" variety. Producers receive information about varieties from a number of sources including; research and extension publications, county extension agents, neighbors, farm supply workers, and seed producers. To help producers evaluate varieties, county agents in cooperation with tobacco specialists conduct many burley tobacco variety trials at the county level.

All varieties in a test plot are typically topped and subsequently harvested at the same time, despite wide differences in maturity dates. This is generally done to simplify experimental procedures. The recommended time of topping for most burley tobacco varieties is when 10 -25 % of the plants have at least one open flower. The earliest varieties, in a trial, may reach 100% bloom before the later varieties have

begun blooming. This means that early varieties are topped beyond the optimum stage while later ones have not yet reached the optimum stage. In either case, a reduction in yield and quality could result for varieties not topped at the optimum stage of flowering.

Methods

Variety trials were conducted in 1994 and 1995 at the University of Kentucky's Woodford County Farm to investigate the potential effects of the time of topping and harvest on varieties with different maturity.

In 1994, 15 varieties were transplanted on June 6. The varieties were split into two groups based on maturity. Four varieties, NCBH-129, R 610, KY 14, and N126 were placed into both groups since they are generally considered to be of medium maturity. Varieties in the early maturing group were topped on August 15 (69 days after transplanting) and harvested September 6

(91 days). Varieties in the late group were topped August 22 (76 days) and harvested September 22 (105 days).

In 1995, 14 varieties were transplanted on June 7, and all were managed in two groups as both early and late maturing. The early group was topped August 10 (65 days) and harvested September 4 (90 days). The late group was topped August 18 (73 days) and harvested on September 5 (91 days). The late group was harvested early because dry weather had stopped growth and was causing leaf deterioration.

After harvest, tagged sticks were hung in a common location in a conventional barn for curing. The tobacco was stripped into three farm grades based on stalk position. Federal Tobacco Graders assigned grades to each stalk position. These grades were converted to a numerical grade index (Bowman et al. 1989). In theory, the higher the grade index the higher the quality. The grade index concept assumes that B1F, B1FR, C1F and B1R are the highest quality tobacco. This assumption of quality may not be valid under the current demand situation.

Results and Discussion

In 1994, the late topped varieties tended to have higher cured leaf yield, but a lower grade index than the early topped group (Table 1). This difference in yield was most likely due to the fact that the late managed group had 29 days between topping and harvest while the early group had only 22 days. The extra week allowed the late managed varieties to achieve greater leaf growth, while the somewhat premature harvest of the early varieties did not allow them to reach full

yield potential. However, later topping and harvest may have resulted in slightly greater leaf damage and thus, a lower grade index. Leaf from the lower stalk position of the late managed group was graded as flyings (X group) while the lower stalk tobacco from the early managed group was graded as cutters (C group). The late managed crop was cured under drier conditions, and had more green and mixed colors than the early managed crop.

For the four varieties managed as both early and late maturing, there was little change in their yield rank relative to each other, as a result of management. These four varieties are all similar in maturity and thus reacted similarly when managed alike.

In 1995, the tendency was for lower yields following late topping and harvesting (Table 2). This resulted primarily from dry conditions and premature harvest of the late managed crop (only 18 days after topping) that did not allow for further growth. The late management did result in a slightly higher grade index than early management. This was the result of a greater degree of damage on the early topped crop due to the dry weather. The early topped tobacco had more "firing-up" than the later topped tobacco.

More important than the absolute yields, however, is how the varieties were affected by management relative to each other. In this case, there was a wide range of maturity dates. Late maturing varieties like KY 907, and TN 86 ranked in the bottom third when topped early, but were the two highest yielding varieties when topped later, even though yields were hurt by a premature harvest (Table 3). Early maturing

varieties like KY 14 x L8, R 610, and C 402 moved down in yield ranking with later topping. Some varieties, like NCBH 129, did not follow this pattern. Although NCBH 129 is considered to be relatively early maturing, its ranking increased with later topping. It has been previously observed that this variety will suffer yield loss if topped too soon. Some varieties like Ky 14, KY 8959, C 403, and NC 3 were relatively unchanged in ranking as a result of management. This suggests that these varieties are perhaps more flexible than some others.

This study has demonstrated that topping and harvest management affected variety performance in different and sometimes unpredictable ways. All of this should be kept in mind when evaluating data from local variety trials, where all varieties have been managed in the same way. Recognize that the lack of optimal management for some varieties may reduce their performance

relative to other varieties in the test. Realize also, that differential response to management can be used to advantage when scheduling work operations during busy times. This is one reason why it is recommended that producers use the "stick row" test to evaluate new varieties on their own farms.

Local variety trials are just one of many sources of information about new varieties. Producers should always consider the need for disease resistance, the management characteristics, and the agronomic performance when selecting a variety. When a producer grows several different varieties, each should be managed according its special needs, and capabilities.



Extension Tobacco Specialist

Literature Cited

Bowman D. T., R. D. Miller, A. G. Tart, C. M. Sasscer Jr, and R. C. Ruffy. 1989. A grade index for burley tobacco. *Tobacco Science*. 33:p.18-19.

Table 1.

Influence of topping and harvest management on the yield and grade index of burley tobacco grown in 1994.

Variety	Early Top and Harvest		Late Top and Harvest	
	Yield lbs./A	Grade Index	Yield lbs./A	Grade Index
KY 14 X L8	3229	83		
C 501	2816	84		
R 611	3129	84		
NCBH 129	3126	80	3532	84
R 610	3011	83	3453	85
KY14	3238	79	3512	77
N 126	3155	80	3454	78
C 403			3606	73
NC 2			3319	78
KY 14 X BU 64			3157	79
TN 90			3320	74
KY 907			3581	68
TN 86			3596	79
KY 8959			3730	76
N 88			3103	79
LSD _{0.05}	283	8	283	8
Mean	3101*	82*	3447*	77*

* Management Effect Means: LSD_{0.05} Yield = 95; Grade Index = 3

Table 2. Influence of topping and harvest timing on cured leaf yield and grade index of some burley tobacco varieties grown in 1995.

Variety	Early Top and Harvest		Late Top and Harvest	
	Yield lbs./A	Grade Index	Yield lbs/A	Grade Index
KY 14 X L8	2613	66	2354	70
C 501	2595	68	2375	71
NCBH 129	2574	69	2497	71
C 402	2809	70	2362	73
R 610	2830	68	2428	72
KY 14	2788	66	2663	59
C 403	2786	60	2589	64
NC 2	2524	68	2495	72
KY 14 X BU 64	2622	65	2327	66
TN 90	2646	67	2411	70
KY 907	2588	55	2827	61
NC 3	2741	70	2552	75
TN 86	2602	62	2780	69
KY 8959	2744	60	2614	67
LSD _{0.05}	224	8	224	8
Mean	2676*	65*	2519*	68*

* Management Effect Means: LSD_{0.05} Yield = 60; Grade Index = 2

Table 3. Relative yield ranking of burley tobacco varieties as influenced by topping and harvest management in 1995.

Early Topping and Harvest	Late Topping and Harvest
R 610	KY 907
C 402	TN 86
KY 14	KY 14
C 403	KY 8959
KY 8959	C 403
NC 3	NC 3
TN90	NCBH 129
KY 14 x BU 64	NC 2
KY 14 x L8	R 610
TN 86	TN 90
C 501	C 501
KY 907	C 402
NCBH 129	KY 14 x L8
NC 2	KY 14 x BU 64

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Early Season and Harvest	Late Season and Harvest
K 880	KY 88
C 402	TN 6
KY 34	
80	
KY 88	
81	
82	
83	
84	
85	
86	
87	
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