

Final 2014 Research Project Report

2014 Research Project Evaluation of Chemical Topping in Burley Tobacco

Submitted to Council for Burley Tobacco
by Murray State University
in coordination with
the University of Kentucky

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Final 2014 Report:

Table 1. Treatment list for evaluation of chemical topping in burley tobacco.

Treatment #	Bloom Stage at MH + Butralin application	Manual Topping^a
1	Early Button/PreBud (top of bud visible but not elongated)	No
2	Elongated Bud Stage (Bud elongated but few open flowers)	No
3	10% Bloom (approx. 10% of plants in plot have at least one open flower)	No
4	10% Bloom (approx. 10% of plants in plot have at least one open flower)	Yes

^aEach treatment will receive MH (1.5 gal/A Royal MH-30) plus Butralin (0.5 gal/A) at the bloom stage shown. Applications will be made as standard broadcast applications with course nozzles at 50 gal/A spray volume. Treatments 1-3 will receive no manual topping following application while treatment 4 will be topped manually after application as is the standard practice.

The first field season of this project to evaluate chemical topping of burley tobacco is now complete. The following is the timeline of practices that occurred for this research project in 2014:

April 10, 2014	'KY14xL8' and 'KT 206' burley tobacco sown in float beds.
June 19, 2014	Burley tobacco transplanted into field
August 11, 2014	All treatments applied to KY14xL8
August 12, 2014	Early button (pre-bud) application made to KT206
August 19, 2014	Elongated bud applications made to KT206
August 27, 2014	10% bloom applications made to KT206
September 23, 2014	All KY14xL8 and KT206 plots harvested and housed for curing

In 2014 we found that KY14xL8, in addition to being an early maturing variety, not only flowers early but also progresses through the bloom stages of flowering very quickly. On Thursday, August 7, it appeared that KY 14xL8 was not quite ready for the first early button application. Rain occurred on August 8 and 9 and by Monday, August 11, nearly all of the KY14xL8 was at least 10% flower. We elected to go ahead and apply the MH + Butralin treatment to all KY14xL8 plots at that time. Although we were not able to recover the timing for most plots of KY 14xL8, we were able to salvage three replications of two of the four treatments in KY 14xL8. The two treatments we were able to recover were the early button/prebud treatment (treatment 1) and the standard manual topping at 10% bloom (treatment 4). Early button applications were made to KT206 the following day. Progression through bloom stages was much slower in KT206 than in KY14xL8, with applications occurring approximately 7 days apart.

Although all applications were made to KY14xL8 on the same day, the MH+Butralin application was successful in stopping terminal growth in all plots of KY14xL8 and at all bloom stages of KT206. For plots manually topped just after application (treatment #4), our average time required for manually topped plots at 10% bloom was 72 seconds per plot, which would be approximately 2 man-hours per acre.

Although MH+Butralin stopped terminal growth (and resulted in excellent sucker control) at all timings, just prior to harvest we elected to manually top tobacco from later applications made at 10% bloom (all of KY14xL8) and even some KT206 plots treated at the elongated bud stage as plants were a few inches too tall for normal handling and housing in our curing structure and it seemed that removal of the dead inflorescence was warranted. Manually topping at this stage took longer and required clippers due to the hardness of the stalks, averaging 87 seconds per plot or approximately 2.5 man-hours per acre. KT206 plants treated at the early button stage showed very little dead inflorescence and so these plants were not manually topped prior to harvest.

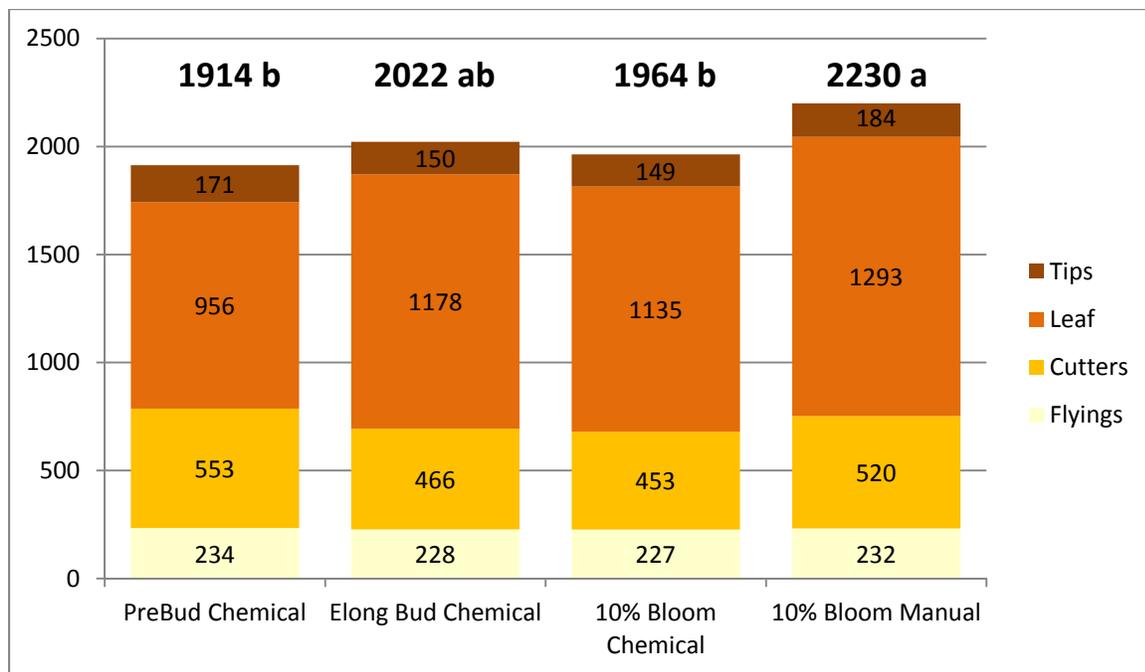
Preliminary results suggest that a later maturing variety such as KT206 may have more potential and suitability for chemical topping. It also appears that the most appropriate bloom stage to

attempt chemical topping with KT206 is at the early button/prebud stage where manual topping appears to be totally eliminated.

Final Yield and Quality Data:

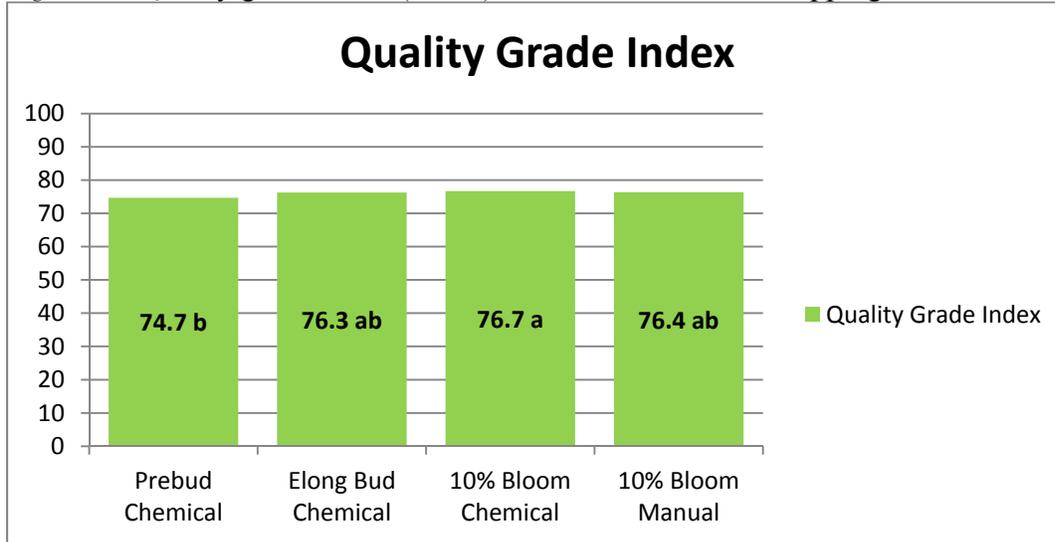
Although in-season field data suggested that the early button/prebud application timing was the best timing to stop terminal growth of the plant, yield data suggested that lowest yields occurred from MH+Butralin application at this timing. KT 206 total yields were lowest where MH+Butralin was applied at the prebud stage (1914 lbs/A), and highest with the standard manual topping at 10% bloom with MH+Butralin application (2230 lbs/A) (*Figure 1*). Although there were some minor differences in quality grade index data for KT 206, quality grade index differences were not major. Lowest quality grade index was seen from plots chemically topped at the early button/prebud stage and was highest in plots chemically topped at 10% bloom (*Figure 2*).

Figure 1. Yield (lbs/A) response of KT 206 to Chemical Topping Practices.



*Total yield per acre shown at the top of each column. Yields followed by the same letter are not different according to Fisher’s protected LSD at p=0.10.

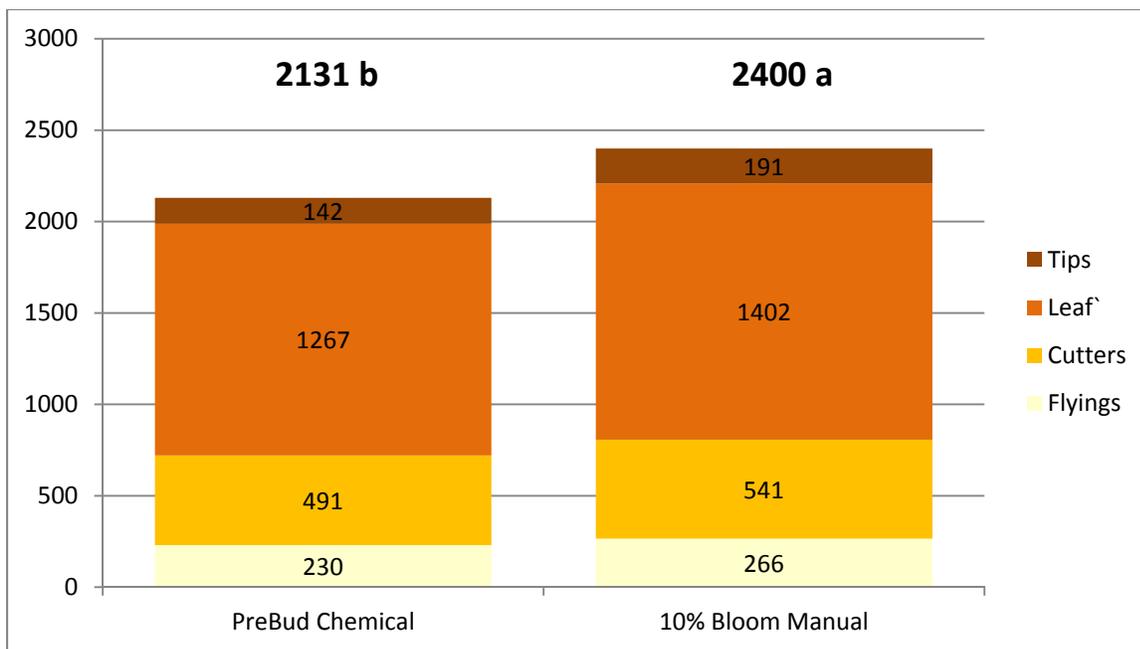
Figure 2. Quality grade index (0-100) results from chemical topping treatments to KT 206.



*Total yield per acre shown at the top of each column. Yields followed by the same letter are not different according to Fisher's protected LSD at p=0.10.

For the two treatments that were recovered from KY 14xL8, total yield (lbs/A) differences between plots chemically topped at the early button/prebud stage and plots manually topped at 10% bloom were similar to differences seen between these same treatments in KT 206 (Figure 3). Total yield in plots chemically topped at the prebud stage was 2131 lbs/A compared to 2400 lbs/A in plots manually topped at 10% bloom.

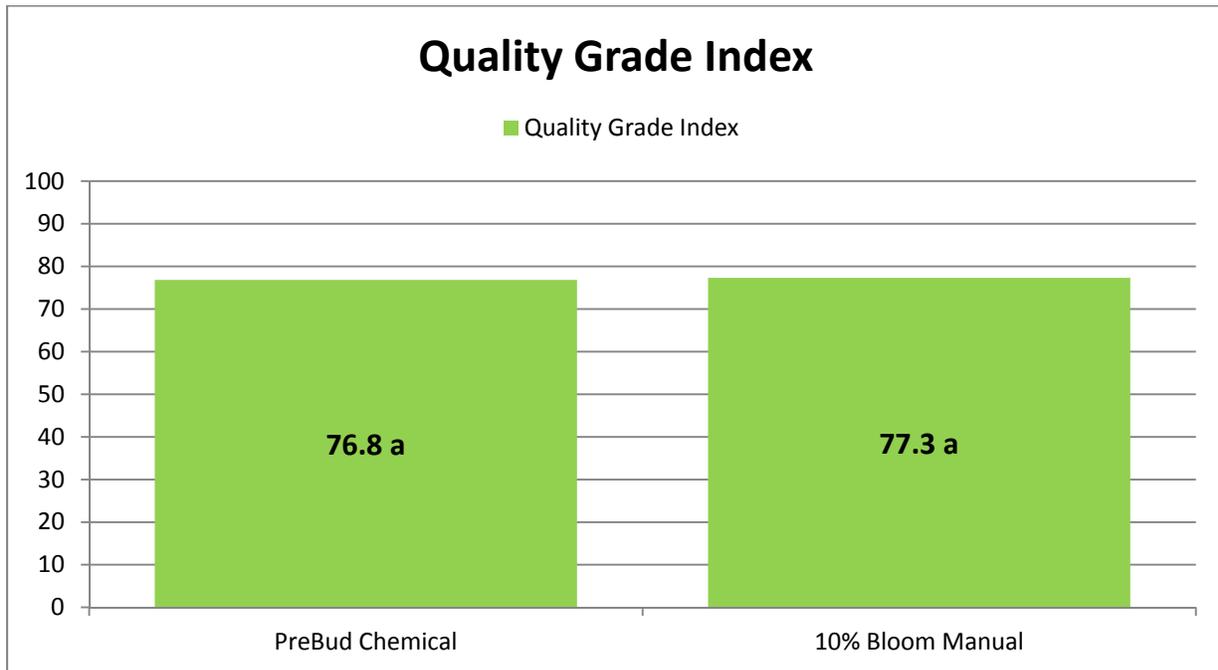
Figure 3. Yield response (lbs/A) of KY 14xL8 to chemical topping practices.



*Total yield per acre shown at the top of each column. Yields followed by the same letter are not different according to Fisher's protected LSD at p=0.10.

Differences seen in quality grade index data for KT 206 were not apparent in the two treatments in KY 14xL8, as grade index was similar for plots chemically topped at the prebud stage or manually topped at 10% bloom (*Figure 4*).

Figure 4. Quality Grade Index (0-100) results of chemical topping treatments to KY 14xL8. Differences between treatments were not significant.



*Total yield per acre shown at the top of each column. Yields followed by the same letter are not different according to Fisher's protected LSD at $p=0.10$.

This experiment will be repeated in 2015. We plan to make special accommodations for the KY 14xL8 variety in order to be able to make all of the applications at the appropriate timings.

Final budget report for 2014 research project expenditures given below:

Expenditure	Cost
Crop maintenance (transplant production, land preparation, fertilizer, transplanting, pest control, harvest)	\$500 per treatment x 4 treatments x 2 varieties = \$4,000
Supplies (float trays, plot stakes, harvest tags, treatment application costs (nozzle tips, chemical, fuel and maintenance for sprayer)	\$1,000