

Report to  
Burley Tobacco Growers Cooperative Association  
2016 Grant Funding for  
**Topping Height of High Leaf Potential Hybrids**

**Investigator(s):** Colin Fisher (P&SS) and Bob Pearce (P&SS)

**Rationale**

The newer burley hybrids released by the Kentucky-Tennessee Tobacco Improvement Initiative (KTII), KT 206LC, KT 209LC and KT 210LC, are considered to be “late maturing” because flower buds develop about 10 days later than the older varieties (KY 14, K14 x L8) and have a higher leaf number potential (HLP), producing six to ten more leaves than the older, lower leaf number potential (LLP) ones. The Kentucky-Tennessee Burley Production Guide recommends that topping should be done when 10 to 25% of the plants are in flower, leaving 22 to 24 leaves on the plant.

As a consequence of this guideline, there are two possible outcomes for these newer HLP varieties if they are topped when the recommended number of plants are in flower: either as many as 6-10 leaves are removed to reduce the leaf number down to the 22 - 24, or, if only the flower is removed, up to 30 leaves will remain on each plant. In the first situation, the potential yield will be reduced because a considerable number of fully expanded leaves would be removed, and in the second, the longer stalks are more difficult to handle during loading and hanging, increasing the risk of houseburn of the overlapping tails in the barn, and the cost of stripping the leaves will also be greater. In both situations, harvesting would be delayed by 7–14 days, and therefore the temperature during curing will be cooler and less conducive to a good cure. The average high temperature drops from 82 to 73°F from September 1 through to September 30, and the average low from 62 to 53°F.

A third possibility may afford the grower several advantages over the current practices: top these HLP hybrids earlier, when leaves 22 to 24 are six to eight inches long. These advantages include reduced stripping costs, easier handling from topping to barn loading, improved sucker control, and less prone to lodging.

These high leaf potential hybrids can “hang on longer” in the field before they need to be harvested. This may suggest that they are slower to ripen in which case harvest may have to be delayed for longer than the conventional 28 days after topping.

The most economically advantageous aspect of topping these hybrids early is that there is the potential for chemical topping which would considerably reduce the cost of labor.

The first test with the objective of rationalizing the topping height of these new varieties was done in 2013. The details of the treatments were modified in each of the two succeeding seasons based on the previous year’s results. This previous work demonstrated that the new HLP varieties (KT 206, KT 209 and KT 210) yield as well as the LLP varieties (KY14 x L8 and KT 212) when these are topped at the same time and to the same number of leaves, but have the potential for an additional 10 – 15% yield if they are topped when 10 – 25% of the plants are in flower. If these HLP varieties are only topped at this late stage, the plants are 16 to 20 inches taller than the LLP varieties, and therefore very awkward to handle through to stripping, and have an additional six to eight leaves. In 2015, the yield from tobacco topped at an intermediate stage five days after the LPP varieties were topped but before any flowers of the HLP varieties had emerged, and then harvested after 33 days rather than the normal and more traditional 28 days, produced the same yield as the later topped treatment that was harvested after only 28 days. It seems therefore that perhaps growers could maximize returns but be able to better handle these tall

HLP varieties by topping when the 23<sup>rd</sup> – 25<sup>th</sup> leaf is six to eight inches long and harvest 33 days later. The 2016 test was an exact repeat of the 2015 test and was aimed at verifying the data from the 2015 test.

### **Progress**

The test was set on June 9. The standard topping of the LLP variety KT 212 and the early topping of the HLP variety KT 210 were done on August 2; the interim topping of the KT 210 on August 6, and the standard topping of the KT 210 on August 12. Harvesting was done on either September 2, 7 or 12 for each of the treatments. The test was stripped into four grades in late January. Stalk height and leaf counts were done in March.

### **Results**

The number of leaves remaining on the KT 212 (treatments 1 – 3) and the early-topped KT 210 (treatments 4 - 6) after topping were all between 20 and 21 (Fig. 1). There were 22 – 23 leaves on the KT 212 plants that were topped four days later (treatments 7 & 8), and 26 leaves on the KT 212 that was topped when the plants were in 25% flower.

The stalk height of the early-topped KT 210 was 43 in. (Fig. 2), and at least 3 in. shorter than the KT 212, despite having the same number of leaves. The late-topped KT 212 (treatment 3) was 5 in. taller than the KT 212 that was topped at the correct time (Treatments 1 & 2). Delaying the topping of KT 210 by four days (treatments 7 & 8) increased the plant height by over 6 in., and when the KT 210 was topped at 25% flower, a further 5 days later, (treatment 9), the plants were an additional 11 in. taller. This additional height is partly because there were 3 – 6 more leaves on the plant than the earlier topped ones, but also because the internode length was greater (Fig. 3).

The total yield of the early-topped KT210 was the same as the KT 212 at about 3300 lb./acre (Fig. 4). However, the KT210 topped four days later was lower, although this was not statistically different. The last topping of the KT 210 (treatment 9) gave a higher yield than both of the 28-day harvest standard-topped KT 212 (treatment 1) and early-topped KT 210 (treatment 4), and both cuttings of the intermediately topped KT 210 (treatments 7 & 8). Although the yield of the early-topped KT 212 and both the early-topped and intermediately-topped KT 210 increased by up to 300 lb./acre when the plants were cut 33 or 38 days after topping (compare treatments 1 vs. 2 and compare treatments 4 vs. 5 vs. 6), these difference was not statistically significant.

### **Discussion**

This 2016 test was an exact repeat of the 2015 test, and aimed at verifying the information from that previous year's test. Crop growth and development in 2015 season was not particularly good because the early season was wet and the latter part of the season very dry. The data from that test (Fig. 5), however, suggested that an intermediate topping height of KT 210 (treatments 7 & 8) would yield as well as the standard topping (treatment 9), especially if it was cut after 33 days rather than the normal 28 days. Crop development in 2016 was much better: the spring was not as wet and the rains were well distributed through the grand growth phase, even though it was rather dry during curing, and the yields were about 700 lb./acre more than in 2015.

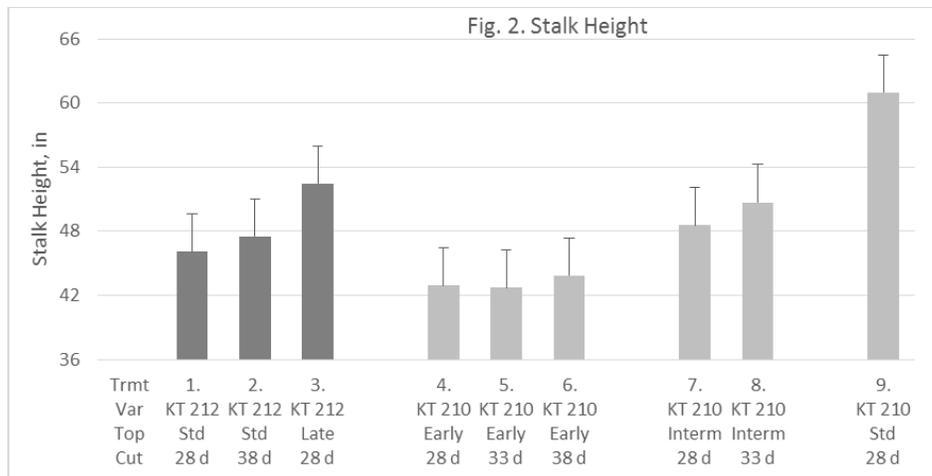
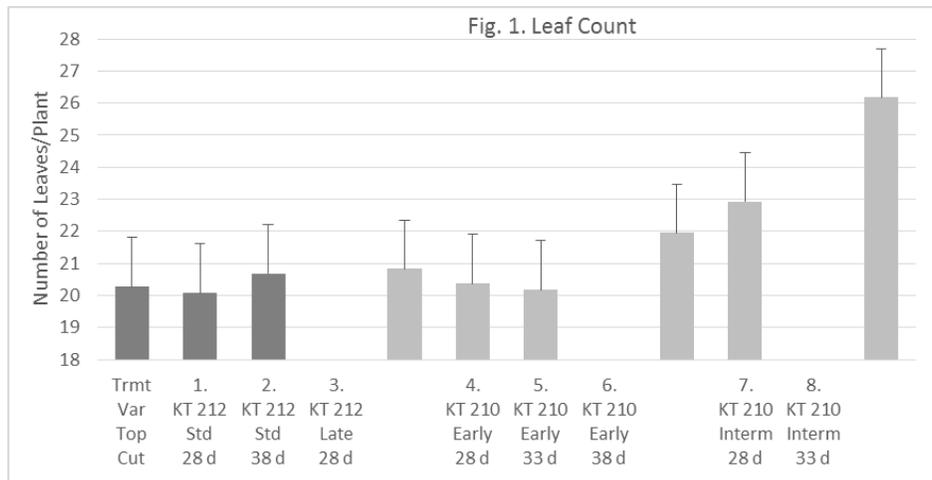
In contrast to 2015, the lower yield, by over 200 lb./acre, in the 2016 test of the intermediately topped treatments (7 & 8) than the early topped KT 210 (treatments 4 – 6) are intuitively not logical because leaf number and stalk height were greater than the early-topped. We did notice, however, that there were some large suckers in these two intermediately topped treatments. Suckercide was applied to each set of treatments immediately after they were topped. We believe that perhaps the concentration

of the suckercide was incorrect when it was mixed for the application to these two treatments, and the consequent sucker growth may well have caused a reduction in yield of up to 500 lb./acre.

### Conclusion

KT 212 was developed by the Kentucky Tennessee Tobacco Improvement Initiative to become an alternative to KY 14 x L8 for growers that had traditionally grown this older variety but were now not able to because of blackshank race 1. Both of these varieties are early flowering and consequently only produce up to 22 leaves. Many of the newer varieties, however, have an equal or superior disease package, and have the potential to produce higher yields, mainly by virtue of having a higher leaf number potential of up to 28 leaves they but flower up to 10 days later at which time they can be very tall and consequently very awkward to manage from topping through to stripping (Fig. 6). Topping these varieties very early, when leaves 20 – 22 are only eight in. long, produce the same yield as the early flowering KT 212, and have the potential to produce a higher yield if topped when leaves 22 – 24 are only eight inches long. It remains to be confirmed by further testing if an additional five days between topping and cutting will produce the same yield as topping these varieties when they are in 25% and very tall.

### Figures



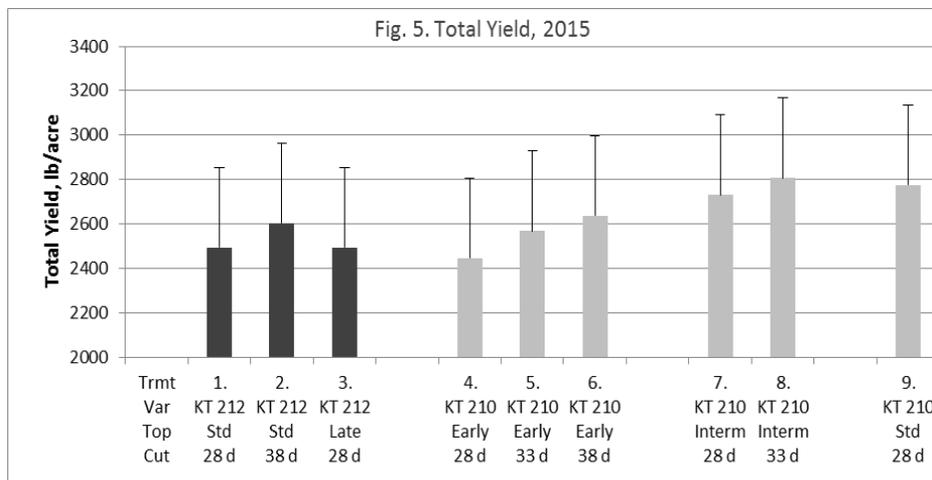
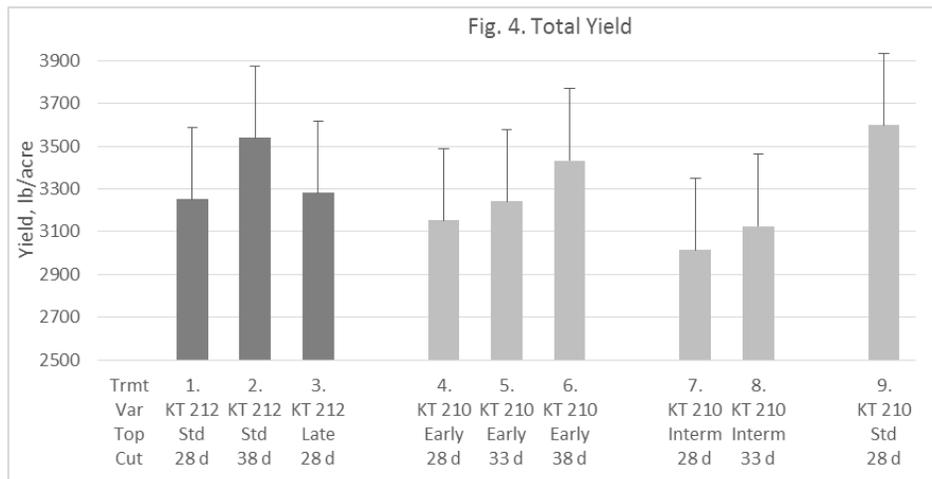
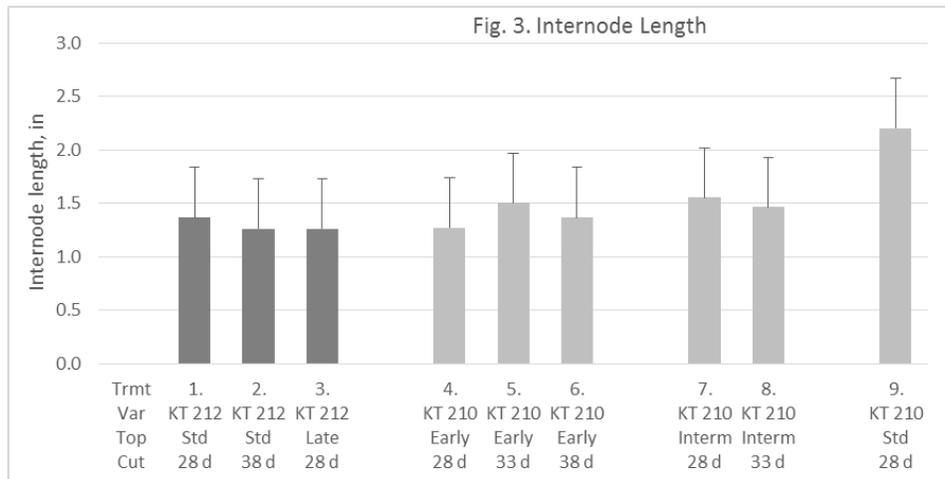




Fig. 1. Sticks of harvested tobacco showing the difference in plant length between the three topping heights of the high leaf number potential variety KT 210: (left to right) standard topping cut 28 days after topping, interim topping cut 33 days after topping and early topped cut 38 days after topping.