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with 100 pounds sidedressed. This rate — 180 pounds of total N — is right in the middle of the recommended rate range for Tennessee, Virginia and North Carolina, and slightly below the recommended rate for Kentucky for tobacco rotated with sod.

Looking at the individual experiments, near maximum yield was actually reached in most cases with 80 pounds N preplant plus 50 pounds sidedressed, but in one case there was a response to 100 pounds sidedressed, which raised the overall average.

These results indicate that when N fertilizer is split between a preplant and a sidedress application, university recommendations are certainly high enough, and it could be argued that they are a little too high. However, when all of the nitrogen was added preplant with no sidedress, yields reached maximum at 240 pounds per acre, which is above recommended rates.

A look at the individual experiments, though, shows that 240 pounds of N actually gave a higher yield than 160 pounds of N in only two of the six experiments. In both of these cases — Greenville and Glade Spring in 2004 — there was above-average rainfall just after planting.

Notice that when 240 pounds per acre was applied preplant, there was no response to sidedress N. This was true in all six experiments, indicating that when N rates this high are used preplant, there is little chance of a response to sidedressing even in a wet year.

**TSNA content of burley leaf lamina by nitrogen rate**  
Average of six experiments  
in Tennessee, Virginia and Kentucky, 2004-05

Sidedress nitrogen (lbs. N/acre)	Preplant nitrogen (lbs. N/acre)		
	80	160	240
	TSNA (parts per million)		
0	1.43	1.85	2.76
50	2.10	2.77	3.57
100	2.56	2.89	4.48

TABLE 2

It should be noted that in all cases the tobacco in these studies was in a good rotation, which may have reduced the response to nitrogen. To answer this question, a new series of experiments was started in 2006 looking at nitrogen response in tobacco following tobacco. Results are not available at the time of this writing, but when they are, the response will be compared to that observed in rotation to see if more N is needed after tobacco.

**TSNA RESULTS**

So in terms of yield, university recommendations look pretty good, but what about TSNA? To a farmer at the current time, this is not as important as yield, but that could change in the future if industry concerns about TSNA continue.

Table 2 gives the average total TSNA content of leaf lamina (main stem removed) from the six experiments.

The optimum level of TSNA is not well-defined, other than the lower, the better. In the past, a leaf lamina content of 1 to 3 parts per million has been considered good, but some in industry are now talking about lower levels than this.

Overall, the numbers show increased TSNA content with higher N rates, with no indication of leveling out at either high or low N rates. The lowest N rates that gave near maximum yield, like 80 plus 50, 80 plus 100, and 160 plus 50, all resulted in TSNA contents between 2 and 3 ppm. The lowest N rate (80 pounds per acre) gave TSNA content of about 1 ppm less than the optimum rates, but the trade-off would be about 200-pounds-per-acre lower yield.

Overall, university nitrogen recommendations appear adequate or possibly even a bit high for producing top yields when split between preplant and sidedress applications. If all the fertilizer is applied preplant, recommended rates will be enough in most years, but if rainfall is higher than normal early in the season, rates slightly higher than 200 pounds per acre may be required.

In these cases, the best strategy is to apply a full recommended rate preplant and be ready to sidedress 50 pounds per acre if rainfall is higher than normal.

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