David Hinnant of Wilson County always looks for new solutions to old problems. He was one of the first in his area to adopt precision agriculture. But he was concerned about the inability of existing technology to manage nitrogen (N), which has a greater effect on tobacco than any other nutrient. Too little N reduces yield and results in pale, slick cured leaf; too much N increases sucker and insect pressure and has other negative effects. Excessive N also contributes to groundwater pollution. N tobacco fertilization recommendations are based on topsoil depth: the deeper the topsoil, the more N applied. To manage N accurately, farmers need to be able to change application rates across a field.

- Hinnant joined an effort that included the Neuse Education Team, the Neuse Crop Management Project, N.C. Cooperative Extension in Wilson County and N.C. State University's Crop Science Department to develop a precision N applicator for tobacco.

- A variable-rate N applicator was built and mounted on a tractor. Topsoil depth was measured across an experimental field. Depths ranged from 8 inches to 30 inches.

- Three N rates were applied across the field: high, low and variable (with a high rate on the deep topsoil portion of the plot and low on the shallow topsoil portion).

- Tobacco buyers penalize growers for low-quality tobacco, such as variegated grade. But the percentage of variegated grades was much lower for the variable N rate (25 percent) and the low rate (14 percent) than for the high rate (42 percent). Researchers saw no yield differences.

- Precision application of N to tobacco increases N efficiency, lowers production costs, increases uniformity, maintains yields, improves tobacco quality and protects ground water.

“Last year we used substantially less nitrogen per acre — about 61 pounds less — and had better yields and quality.”

—David Hinnant
Wilson County tobacco farmer