

## Reidsville Long-Term Tillage Trial Fund

Raleigh, NC 27695-7619

### Agriculture Science Affiliates, NC Producers, Business Partners, Friends:

919.515.2655  
919.515.2167 (fax)

The Department of Soil Science has a long-standing commitment to agricultural sustainability and environmental stewardship through our teaching, research, and outreach programs. Conservation tillage has been, and continues to be, a vital component of this effort.

For over seven decades, Department faculty have conducted tillage trials on the major soil types across North Carolina's physiographic regions, seeking to understand and manage soil characteristics that impact productivity. We have accomplished this through collaboration with the Departments of Crop Science, Biological and Agricultural Engineering, Pathology, and Entomology, and through the generous support of public and private sector stakeholders. Most of these trials were of short duration and, while invaluable in terms of the scientific insight gained, few have survived to this day.

Fortunately, two long-term tillage trials at the Upper Piedmont Research Station in Reidsville, North Carolina, remain intact. In one trial, there are nine tillage treatments varying in timing and intensity: fall or spring moldboard plowing, fall or spring chisel plowing with or without disking, spring disking only, no-till, and no-till with shallow in-row ripping. The other experiment involves alternating, on an annual basis, conventional and no-till, and no-till with shallow cultivation compared to continuous conventional and no-till systems. Both trials have been maintained in corn or a corn-soybean rotation since 1984.

The Reidsville tillage trials have hosted many researchers, students, and growers from North Carolina and around the globe who share a common interest in land stewardship and soil conservation. Recent work in 2006-2007 sponsored by the Corn Growers Association of North Carolina examined the long-term effects of tillage on soil porosity, density, aggregation, carbon accumulation, and corn yield (**Fig. 1**). Current work involves the use of relatively new technologies such as a multi-depth capacitance probe and remote sensing to characterize profile moisture dynamics, surface topography, and subsurface soil properties over multiple cropping seasons (**Fig. 2**).



**Figure 1.** Twenty-five years under moldboard plow tillage (left) has induced striking growth differences in early season corn. NCSU researchers are attempting to elucidate the mechanisms governing long-term soil-crop productivity in tillage systems.



**Figure 2.** Remote sensing via ground-penetrating radar (GPR) and light detection and ranging (lidar, pictured above) are being employed to assess soil surface and profile characteristics in tillage systems.

We seek to establish a modest fund to help maintain these unique trials for future generations. The primary purposes of the fund would be to: (1) provide resources to leverage against gaps in state, commodity group, and federal support; and (2) enhance the visibility of our outreach efforts via local, state-wide, regional, and national publicity for sustainability and environmental stewardship. To these ends, we have the support of Drs. Michael Waggener and David Smith, heads of the Departments of Soil Science and Crop Science, respectively, and that of Dr. Joseph French, superintendent of the Upper Piedmont Research Station.

We look forward to sharing our vision for preserving and enhancing these unique, historic trials. Working together, we can advance a science-informed interpretation of long-term sustainability in local, regional, and global agriculture enterprises. To discuss opportunities related to this initiative, we invite you to contact us.

Sincerely,

Jeffrey G. White  
Associate Professor  
jeff\_white@ncsu.edu

Robert D. Walters  
Research Specialist  
robert\_walters@ncsu.edu