Varietal effects of cereal rye on recovery of soil inorganic nitrogen. (C03-ranells184937-Oral)

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Abstract:

Integration of cereal rye cover crops can reduce residual soil nitrogen (N) and minimize N load to surface waters. A two-year experiment was conducted at the Center for Environmental Farming Systems in Goldsboro, NC on a Typic Hapludult to examine the effect of 4 residual soil N levels on dry matter (DM) accumulation and cover crop scavenging of soil N. A randomized complete block design was established with main plots as residual N rate and subplots planted to 9 rye cultivars. Ammonium nitrate (0, 22, 44, or 88 kg N ha-1) was broadcast in the main plots and incorporated to a depth of 15-cm prior to planting rye in mid-November. In early February and mid-March each year, soil was sampled in 30-cm increments to a depth of 91 cm. In 2001, root counts were conducted using the core-break method, roots washed from a 4-inch long core, and scanned digitally for measurements of root surface area and root length density. Facultative ryes established more rapidly, accumulated greater DM in the fall, and recovered greater N than winter rye cultivars. Root counts were negatively correlated with the inorganic soil N content of soils but differences among cultivars could not be detected.

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