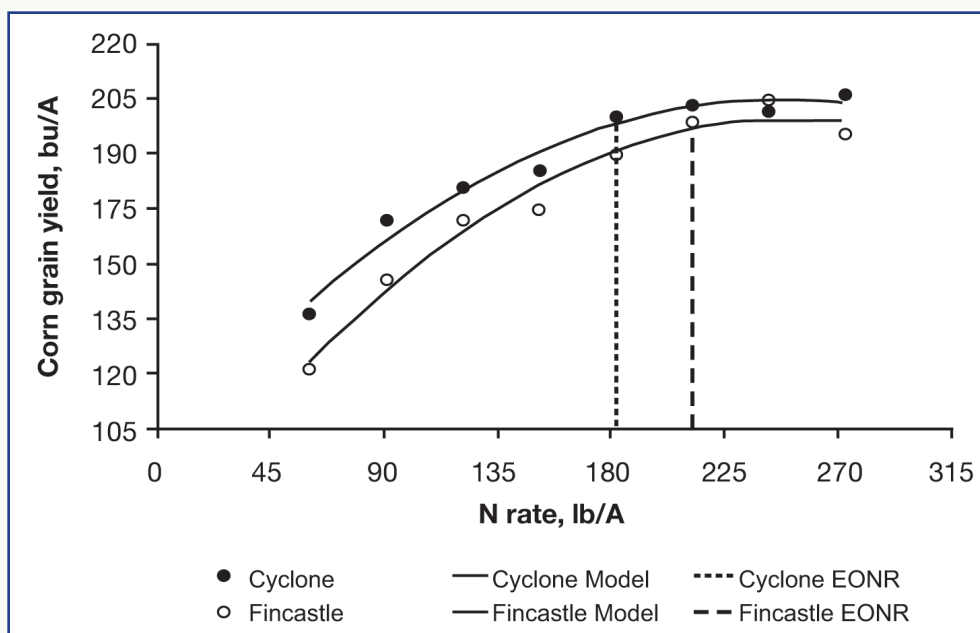


Case Study 7.2-1 Adaptive nitrogen management to soils using local data for U.S. Midwest corn. In this example of adaptive N management (Murrell, 2004), an agronomist sought to make improvements upon the N rates recommended by the university in his state. The agronomist had already established a site-specific management program in which soil types were used as the basis for creating management zones within fields. Phosphorus, K, and lime were varied across these zones as their individual needs dictated. However, N was still being applied at one uniform rate across the field, and the university did not provide guidance for site-specific applications.

To determine what differences, if any, should be made to the recommended N rates for the two predominant soils in his area, the agronomist conducted a 5-yr. study that examined corn response to various N rates for the two soils: a Fincastle silt loam and a Cyclone silt loam. Nitrogen rates were selected to encompass local farmer management practices as well as university recommendations. The study was designed so that corn always followed soybean, reflecting local cropping practices.

The Figure shows the 4-year average results (a drought year excluded), indicated that the Cyclone silt loam, which was higher in organic matter, had an economically optimum N rate (EONR) 30 lb/A lower than that recommended by the university. The Fincastle silt loam, which was lower in organic matter, still needed the fully recommended rate (210 lb/A). These results were counter to the opinion held by the farmers in the area that the Cyclone soil, because it was more productive, should receive more, not less, N. Results from this experiment were used to create new recommendations for the Cyclone soil and created the scientific basis for the agronomist to begin a new site-specific N program that varied N rate according to soils within the field. **Source:** Murrell, T.S. 2004. *In* A.R. Mosier et al. (eds.) *Agriculture and the nitrogen cycle: Assessing the impacts of fertilizer use on feed production and the environment.* Scope 65. Island Press, Washington, DC. p.155-165.



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