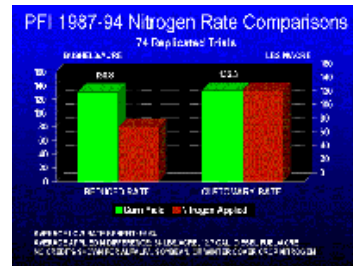


## Nitrogen Management Using Ridge Tillage

This project was begun when Iowa was in the early stages of introduction of the late spring soil nitrate test for corn. Practical Farmers of Iowa cooperators assisted in bringing the test to the public. They evaluated the instructions that for the soil test and the accompanying nitrate test kit. In addition, through this project and others, they collected data from replicated trials comparing rates set with the test versus their customary methods. It was not clear, at the onset, whether the same guidelines apply in all tillage systems. Ridge-till, because it avoids spring primary tillage, typically shows delayed mineralization of soil nitrogen relative to conventional tillage. These trials have been important in demonstrating the applicability of the test to ridge tillage.



The table above summarizes results of nitrogen rate trials carried out in this project. The average nitrogen rate difference between the high and low-rate treatments was 54 lbs N per acre, the energy equivalent of 12.7 gallons of diesel fuel per acre. The average profit was \$6.64 per acre greater in the low-rate treatments.

Despite the rarity of statistically significant yield differences, there was a consistent, small yield loss at the low rates, averaging 1.5 bushels of grain per acre. Assuming that this trend was real but beyond the sensitivity of the design used, one must subtract from the \$6.64 advantage the value of this grain. However, in some of the trials where the late spring test was used, it was actually the higher of the two N rates that was based on the test. In only two instances did following the recommendation of the test lead to a significant yield loss. PFI farmers often undercut the recommendations of the test with their low N rate. The farmers' opinion seemed to be that having livestock manure and green manure in their system increased the potential for soil mineralization of nitrogen that would not be registered by the soil test. Subsequent research at Iowa State University has confirmed that belief. Distinct critical levels have recently been set for manured soils and for corn following alfalfa by one or two years.