

## THE EFFECTS OF N-SOURCE ON YIELD IN FOUR WINTER WHEATS AND A TRITICALE

Gary Banowetz and Dale Coats

The form of nitrogen (N-source) applied to wheat and other crops can have dramatic effects on crop yield. Commercial crop fertilizers supply nitrogen as some form of either ammonium or nitrate. Certain cultivars seem more adapted to ammonium nitrogen while others yield better in response to nitrate. Interest in the effect of N-source on wheat yield is based both upon economic and environmental factors. While ammonium-N is tightly bound by the top few inches of soil and may remain available to the plants for an extended period of time, nitrate-N is not tightly bound and is subject to leaching through the soil. This leaching represents a loss of available nitrogen to the plants and a possible source of ground water contamination. The capacity of a specific cultivar to use either ammonium-N or nitrate-N is dependent upon genetic factors that affect nitrogen uptake and metabolism.

Data summarizing the results of the third year of an ongoing study on the effects of N-source on four winter wheat cultivars (Stephens, Yamhill, Malcolm, and Hyak) and a triticale (Celia) is being collected. There were no significant differences in either yield or 100-seed weight that could be attributed to N-source in this third year of the study. The effects on protein are not yet available. In the first year of the study, a single fall application of either urea, calcium nitrate, ammonium sulfate, or ammonium nitrate showed no significant differences in yield attributed to N-source. In the second year of the study, a second fertilizer application (in the spring) was added. During the second year, significant differences in yield occurred in both Yamhill and Malcolm. Malcolm yields were highest in plots that received ammonium nitrate while Yamhill yields were highest in response to calcium nitrate.

Wheat plots in the third year of the study were planted in land in which potatoes had been grown the previous year. After the potatoes were harvested, residual soil nitrogen was quite high and may have affected the results of this year's study.