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BULK THIRD-CLASS

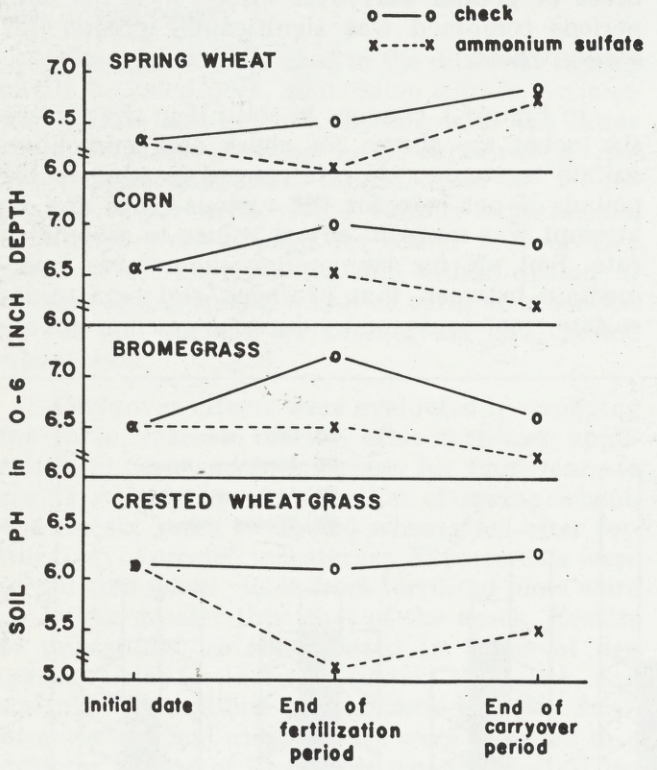

Figure 3. Effect of N fertilization on soil pH for various crops. Spring wheat received 60 pounds N/A, corn and bromegrass 100 pounds N/A, and crested wheatgrass 160 pounds N/A.

were similar to those of the check. The pH data indicate that increased soil acidity resulting from fertilization usually remained after fertilization was discontinued. At the end of both periods, the pH in fertilized soil was lower than that in unfertilized soil. Changes in pH of check plots with time were not associated with the treatments under study. However, neither N source nor N rate seriously affected crop stand or plant growth.

Results of this work indicate that fertilization with ammonium nitrate usually produces dryland crop yields equal to or greater than yields obtained from other N sources. However, ammonium sulfate and calcium nitrate are in most respects only slightly less efficient during the fertilization period. Where included in the experiments, urea was as effective as ammonium nitrate at low to moderate rates of application, but not at the higher rates. Since fertilizer N source had no influence on water use (all available water in the root zone is normally used by harvest for most dryland crops), fertilizer N sources providing the greatest production also provided the greatest efficiency in water use. By proper selection of fertilizer materials, the dryland farmer eliminates N as a growth limiting factor and obtains near maximum yield and water-use efficiency from available water. However, a long-term reduction in soil pH resulting from N fertilization and consequent carryover effects may require future changes in fertilizer management practices for these semiarid soils.