

IN-SEASON NITROGEN AND PHOSPHORUS AVAILABILITY FROM FALL COMPOST APPLICATION IN SPRING WHEAT

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Current interests in carbon sequestration, organic farming, and alternative fertilizer requires information on nitrogen (N) mineralization rates of composted steer manure under irrigated conditions in Southeast Idaho. The objectives of this study were to examine the effect of different compost rates on nitrogen (N) availability and yield for a spring wheat crop on small plots and measure the spatial variability of available NO_3^- and yield for the different compost rates on large scale plots. On the small plots, compost was applied and incorporated in early spring before planting at rates of 0, 4, 6, 8, 12, 16, and 24 ton acre^{-1} . The large scale plots consisted of two sites with five treatments with three replications and each plot was 0.25 acre, and treatments consisted of composted steer manure applied at rates of 0, 2, 4, and 8 ton acre^{-1} and a control (conventional fertilization). Soil samples were taken before planting, mid-season, and post-harvest and were analyzed for nitrate. Grain yield will be collected and compared among treatments during fall harvest. Spatially available N will be compared to soil properties and landscape attributes for determining factors influencing the availability of N from compost. Visual observations indicate that the large scale compost treatments are N deficient compared to the conventionally fertilized treatment. The cool spring and early summers in Southeast Idaho result in slow mineralization rates when the wheat crop needs the N the most. Compost application can reduce the amount of fertilizer N applied to a crop, but cannot replace fertilizers as the only source of crop N.