

BINFORD, G.D., and A.D. BLAYLOCK, University of Nebraska, 4502 Avenue I, Scottsbluff, NE 69361 and University of Wyoming, 747 Road 9, Powell, WY 82435. -

Relationship between in-season soil nitrate concentrations and sugar beet yields.

Recent studies in the Corn Belt have shown good relationships between corn yields and concentrations of nitrate in the surface 12-inch layer of soil when corn plants are 6 to 12 inches tall (i.e., presidedress). The value of this test is that it is essentially an "in-situ" mineralization test, which can allow adjustment in fertilizer N rates for amounts of N mineralized during the spring. This test should have potential for any high N using crop, such as sugar beets. The objective of the study reported here was to evaluate the potential of using an in-season soil test for improving N management during production of sugar beets. Six N rate studies were utilized in Nebraska and Wyoming during the 1993 and 1994 seasons. Ten rates of N (0 to 270 lb N/acre; 4 replications) were applied at each location as broadcast ammonium nitrate in the spring shortly before planting sugar beets. Soil samples were taken from the surface 12-inch layer of soil in two-week intervals from early May through July and analyzed for nitrate concentration. Relationships between yields and concentrations of soil nitrate tended to improve with time. The optimum sampling time appears to be somewhere between mid-May and late June. The critical concentration of soil nitrate in the surface 12-inch layer of soil appears to be near 22 ppm N, and surprisingly, does not appear to change significantly between mid-May and mid-June.