

Response of Potato to Ammonium Sulfate Nitrate in Idaho

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Potatoes are sensitive in their requirement of an adequate and steady supply of N. In the past, ammonium nitrate (AN) was commonly used since it is not susceptible to ammonia volatilization under hot, humid, and windy conditions. Ammonium nitrate is no longer readily available in the region and although its substitution with ammonium sulfate (AS) provides one option, AS is more expensive per unit N and it may supply more S than is required. A new fertilizer product (Sulf-N 26), a fused combination of AN and AS, offers one more possible alternative source of potato nutrition. Two controlled-release fertilizers based on AS (SRAS15 and SRAS20) are also of interest. A field experiment was conducted near Paul, Idaho, on irrigated potatoes to compare these experimental N fertilizers with conventional farmer practices that primarily rely on the use of urea ammonium nitrate (UAN).

Petiole nitrate concentrations were monitored weekly, but no differences were noted between the N sources. The potato harvest occurred on September 10 when the middle 20 ft. of the two center plot rows were sampled, weighed, and graded for size and quality. Later analysis included potato defects, specific gravity, and storage quality. As observed in the 2007 growing season, no significant differences in yield or properties were found among the soluble N fertilizers. Tuber size was greatly increased with fertilization, compared with the unfertilized control. However, N fertilization also caused a drop in specific gravity. The controlled-release N fertilizers performed very well. Both SRAS15 and SRAS20, applied at only two-thirds the rate used for conventional products, had larger yields than those obtained with UAN or Sulf-N 26. The first year of data on these new fertilizer products appears very promising, similar to results obtained with other controlled-release fertilizers.