

Russet Burbank Potato Response to Repeated Dairy Manure Applications in Kimberly, Idaho: Initial Findings

Amber Moore¹, Megan Satterwhite¹, Nora Olsen², and Mary Jo Frazier²

University of Idaho, ¹Twin Falls Research and Extension Center, Twin Falls ID 83301, and
²Kimberly Research and Extension Center, Kimberly ID 83341.

The geographic overlap of dairy and potato production in Southern Idaho has caused potato growers to wonder about the potato growth response to dairy manure field applications. To help answer questions surrounding this overlap of industries, an ongoing, eight year study to evaluate initial findings regarding potato response to dairy manure application was initiated in Kimberly, Idaho. Beginning in the fall of 2012, stockpiled dairy manure was fall-applied either annually or biennially (every other year) at rates of 16, 32, or 48 ton acre⁻¹ (wet weight basis, average moisture content of 50%). Fertilizer-only and control treatments (no nutrient applied) were also included in the design. When potatoes were initially grown on these fields in 2014, annual dairy manure applications at the 48 ton acre⁻¹ rate significantly decreased tuber yields to 447 cwt. acre⁻¹ in comparison to biennial applications of 48 ton acre⁻¹ (tuber yield: 523 cwt. acre⁻¹) and annual applications of 16 ton acre⁻¹ (tuber yield: 519 cwt. acre⁻¹). Yield increases for the biennial manure treatments were directly linked to increase in very large size class potatoes (>12 oz.). Tuber yield decreases associated with the 32 and 48 ton acre⁻¹ annual application treatments may be related to soil salinity. Soil electrical conductivity levels at the first-foot depth of these high manure treatments were 3.5 dS m⁻¹, which greatly exceeds the established 1.7 dS m⁻¹ soil electrical conductivity threshold for potato production. Tuber specific gravity also decreased significantly with increasing manure applications, with the most notable decrease occurring in the annual manure applications. Stem end fry color was negatively impacted by the annual applications of higher rates of manure which would have consequences for process grown potatoes. Early season tuber number per plant and late season tuber specific gravity and senescence measurements will be added in 2016 to evaluate the impact of manure applications on tuberization and maturity, which are factors that may also be contributing to lower yields and quality associated with the heaviest manure application rates.