

# HIGHLAND RUSSET

## AGRONOMY NOTES

### Highland Russet - (A9045-7)

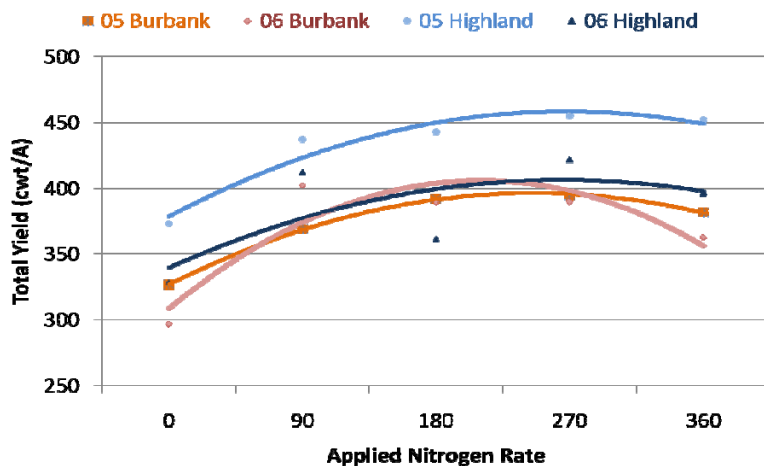
Highland Russet is a mid to late season russet variety with good processing quality. It produces high yields with a high percentage of U.S. No. 1 tubers with relatively good size uniformity. It has moderately high specific gravity and is resistant to second growth, hollow heart and most internal defects. Fresh market use for Highland Russet may be limited due to its light skin, but tuber conformation and uniformity are excellent.

### Fertilization

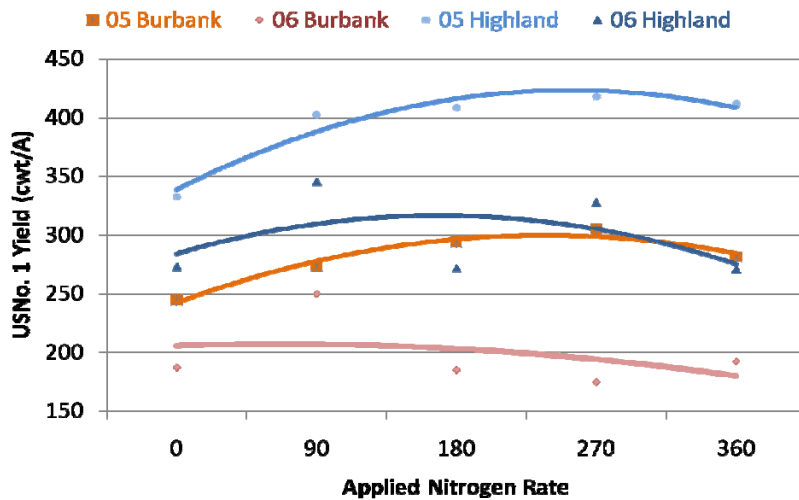
The following graphs present N response data from 2005 and 2006 for Highland Russet and Russet Burbank grown on a Declo sandy loam soil at the University of Idaho Aberdeen Research and Extension Center. Trials were grown following grain in the rotation. Row spacing was 36" and in-row spacing was 10.6". Crops were irrigated to maintain available soil moisture above 65%. University of Idaho recommendations were followed for herbicide, pesticide, and fungicide applications.

Nitrogen response studies were conducted using five N application rates (0, 90, 180, 270, 360 lb N/acre) with half of total N applied pre-plant with the remainder divided into three equal applications at 2 week intervals starting at tuber initiation. Pre-plant available soil nitrate concentrations were 16 lb N/acre in 2005 and 18 lb N/acre in 2006.

2005-2006 Total Yield Response to N Rate of Highland Russet vs. R Burbank

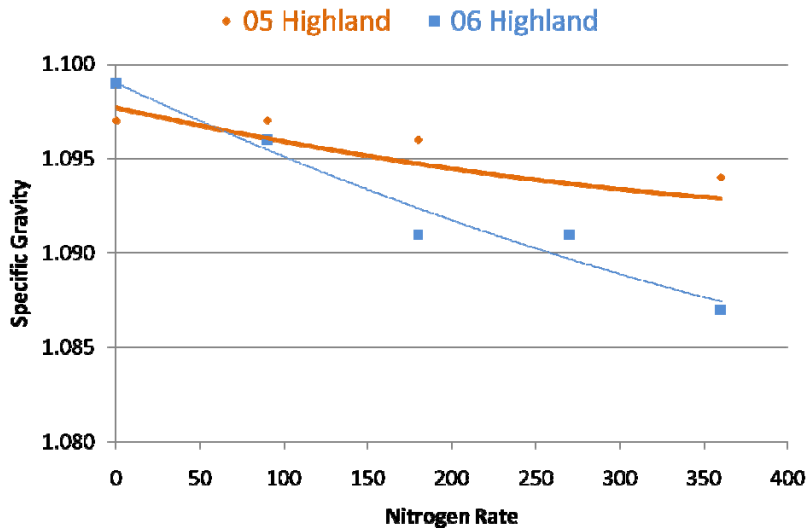


## 2005-2006 USNo.1 Yield Response to N Rate for Highland Russet vs. R Burbank

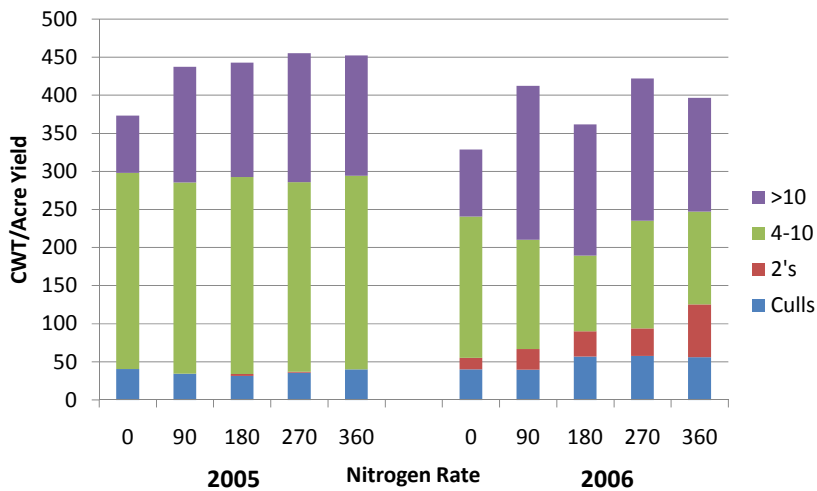


Total and US No.1 yield responses to N application indicate that N requirements are similar to Russet Burbank per cwt of yield produced. Typically, 1/3 to 1/2 of the seasonal N requirement should be applied by row closure, with subsequent in-season applications being based on petiole nitrate concentrations. For southern Idaho, total soil plus fertilizer N recommendations are 240 lb N/acre in areas with a 400 cwt/acre yield potential, 280 lb N/acre in areas with a 500 cwt/acre yield potential and 320 lb N/acre in areas with a 600 cwt/acre yield potential. Nitrogen uptake decreases significantly after August 10-14 so N applications should not be made after that time. Petiole nitrate sufficiency levels for Highland are about 3,000 to 5,000 ppm higher than Russet Burbank through tuber bulking. Excessive nitrogen can reduce yield and quality and prolong maturation and also can decrease specific gravity.

## 2005-2006 Specific Gravity Response to N Rate



## 2005-2006 Size Distribution - Highland Russet



Increased N application rates increased the proportion of large tubers but also tended to increase the proportion of culls and no. 2's

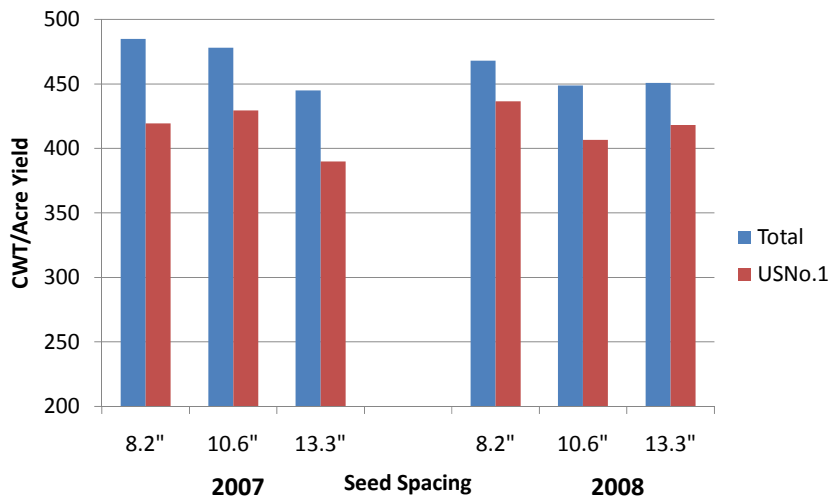
## Spacing

The following graphs present data for the response of Highland Russet to seed piece spacing. Trials were conducted in 2007 and 2008 at the University of Idaho Aberdeen Research and Extension Center. Row spacing was 36" and in-row spacing was 8.2", 10.6", or 13.3". Trials were irrigated to maintain available soil moisture above 65%. University of Idaho recommendations were followed for fertilizer, herbicide, pesticide, and fungicide applications.

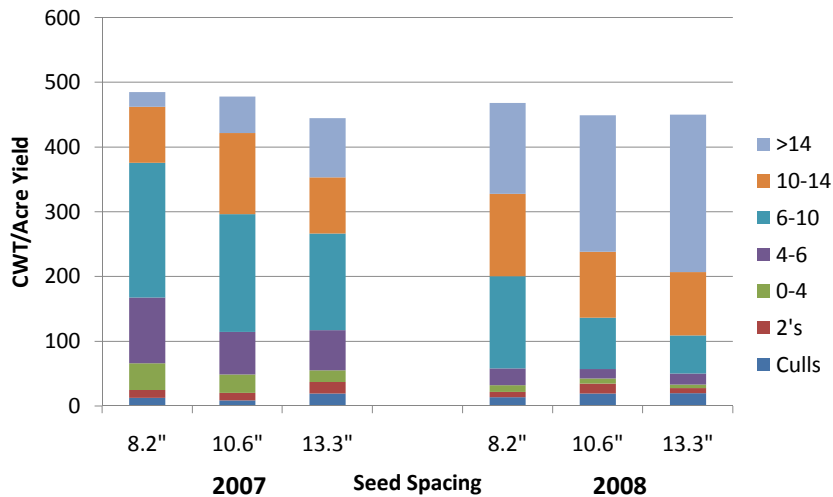
Total and U.S.No.1 yields for Highland Russet were highest at the 8.2 inch spacing. As seed piece spacing increased, the yield of > 14 oz tubers increased while yields of 6-10 oz tubers decreased. The data indicate that an 9 to 11 inch seed piece spacing for Highland Russet is optimal for yield in southeast Idaho. However, a narrower spacing of 8 inches should be used if having a high proportion of very large tubers is a concern.

Highland Russet produces exceptionally large tubers in the Columbia Basin of Washington. Therefore, growers should space 1 ½ - to 2 ½ oz seed pieces 6-8 inches apart within 34 inch wide rows for late harvest and 8 to 10 inches apart for early harvest (110-130 days after planting). Recommended final planting depth is 6 inches below soil level.

2007-2008 Total & USNo.1 Yield  
Highland Russet – Seed Spacing



## 2007-2008 Size Distribution Highland Russet – Seed Spacing



### Irrigation

Seasonal irrigation requirements for Highland Russet are similar to those for Russet Burbank, although Highland Russet is significantly more resistant to water stress-related tuber defects. Therefore, available soil moisture (ASM) should be maintained within the range of 65 to 80% for optimal yield and quality. This irrigation regime should minimize the potential for common scab development. Plant water uptake decreases appreciably in late August, so irrigation application rates need to be adjusted according to soil moisture measurements to avoid developing excessively wet soil conditions that promote disease and enlarged lenticels. Bruise susceptibility is similar to Russet Burbank. Therefore, low soil moisture (<60%ASM) conditions should be avoided during tuber maturation and harvest to minimize tuber dehydration.

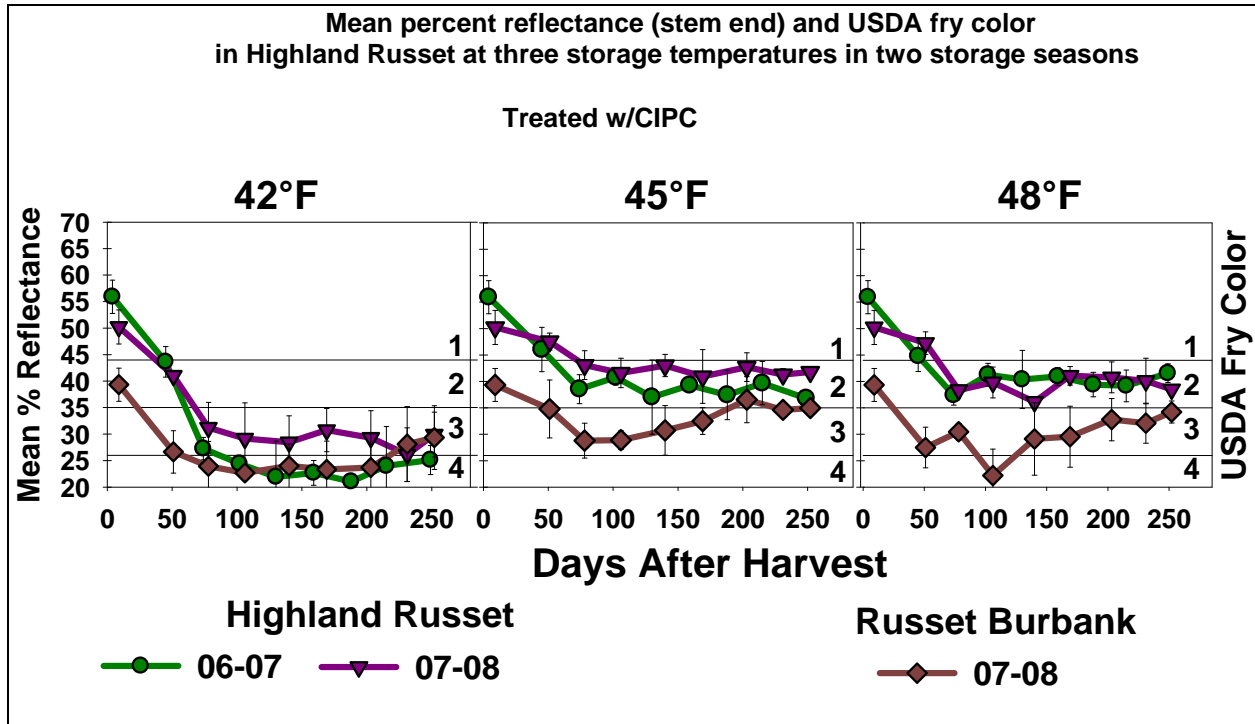
### Harvest

Vines should be killed 2-3 weeks before harvest to allow for proper skin maturation and chemical maturity.

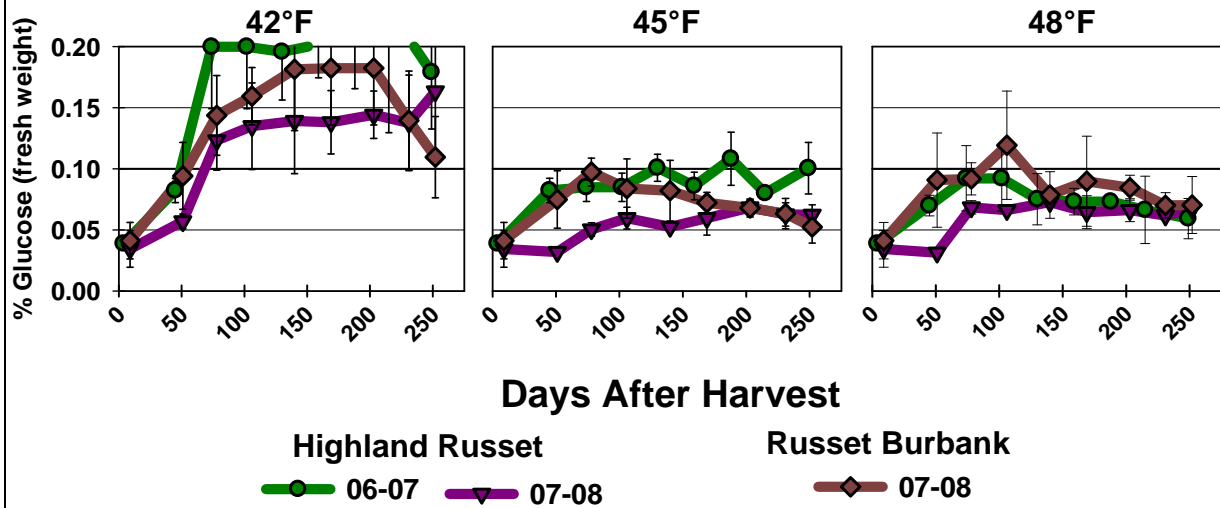
### Storage

Tuber dormancy for Highland Russet is approximately 110 days at 42°F, 85 days at 45°F, and 80 days at 48°F. On average, this is 60 days shorter dormancy length than Russet Burbank. If long term storage is desired, sprout inhibitors must be applied before dormancy break (80 days at 48°F). Fusarium dry rot susceptibility in Highland Russet is similar to Russet Burbank. In two years of trials, severity and incidence were not statistically different among the two varieties. In two years of testing, weight loss was significantly higher in Highland Russet compared to Russet Burbank. On average, Highland Russet had a total (after 9 months storage) weight loss approximately 1.5-2 times higher than that observed in Russet Burbank.

Glucose concentrations for Highland Russet during two years of storage research ranged from 0.07 to 0.10% (fresh wt basis) at both 45° F and 48° F from about 30 days after harvest throughout nine months of storage. USDA fry color scores from non-stressed tubers also remained acceptable ( $\leq 2$ ) during nine months of storage. At 45° F glucose peaked at about 180-190 days after harvest, but at 48° F, glucose peaked at about 80-110 days in storage and then gradually decreased with time. Research indicates that in growing seasons with normal temperatures, a storage temperature of 45 to 48° F is appropriate for processing. However, in years with significant periods of high temperature stress, a higher storage temperature (45 to 48° F) may be necessary to maintain optimum processing quality.



Percent glucose (fresh weight) in Highland Russet potatoes in two storage seasons (2006-08) at storage at three temperatures compared to Russet Burbank (2007-08).



Revised March 16, 2010