

# PREMIER RUSSET

## AGRONOMY NOTES

### Premier Russet – (A93157-6LS)

Premier Russet is a dual purpose russet potato variety with resistance to the accumulation of reducing sugars following long-term storage at temperatures as low as 42 F. It is a late season variety with oblong tubers and produces a high yields with a high percentage of U.S. No. 1 tubers. This variety has high specific gravity and is resistant to most external defects. It is resistant to PVY<sup>o</sup>, common scab, and early dying and is also tolerant of water stress. However, it is susceptible to blackspot bruise, hollow heart and dry rot and should be managed accordingly.

### Fertilization

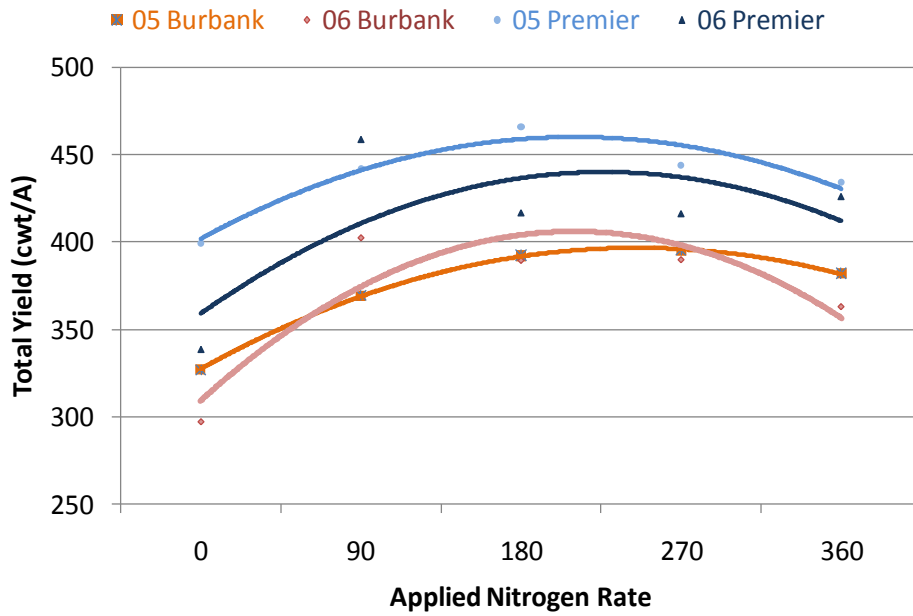
The following graphs present N response data from 2005 and 2006 years for Premier Russet and Russet Burbank grown in a Declo sandy loam soil at the University of Idaho Aberdeen Research and Extension Center. Trials were grown following grain in the rotation. Row spacing was 36" and in-row spacing was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

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

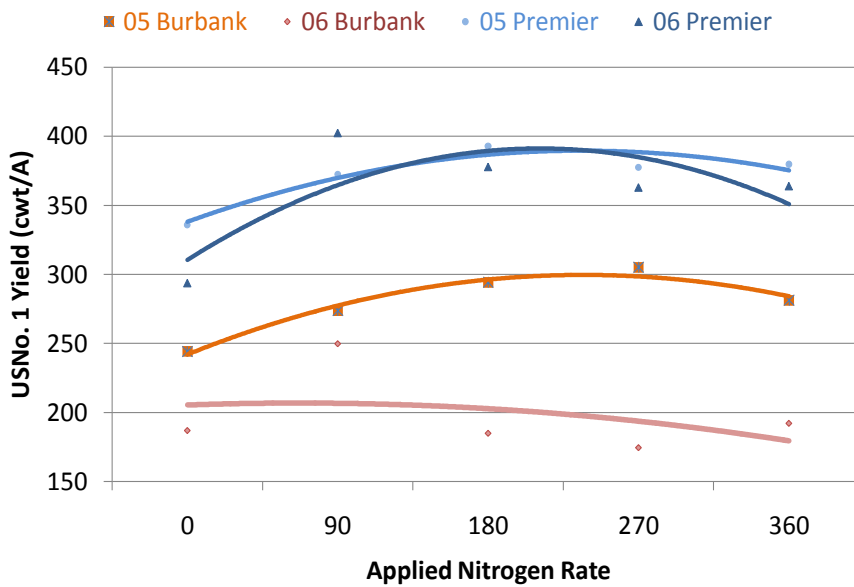
Total yield response data shows that Premier Russet requires only about 80-90% of the N fertilizer required by Russet Burbank. Nitrogen availability should be kept relatively low prior to tuber bulking to minimize the potential for hollow heart development. For optimum effectiveness, most of the N fertilizer should be applied during tuber bulking but should be completed by the first week of August to allow for adequate skin maturation. Petiole nitrate sufficiency levels for Premier Russet run about 3,000 to 5,000 ppm higher than Russet Burbank during early bulking, about the same as Russet Burbank during mid bulking and about 2,000 to 4,000 ppm lower during late bulking.

Increasing N fertilizer rates generally decreases specific gravity for Premier Russet but gravities still remain high within the optimal N range for yield.

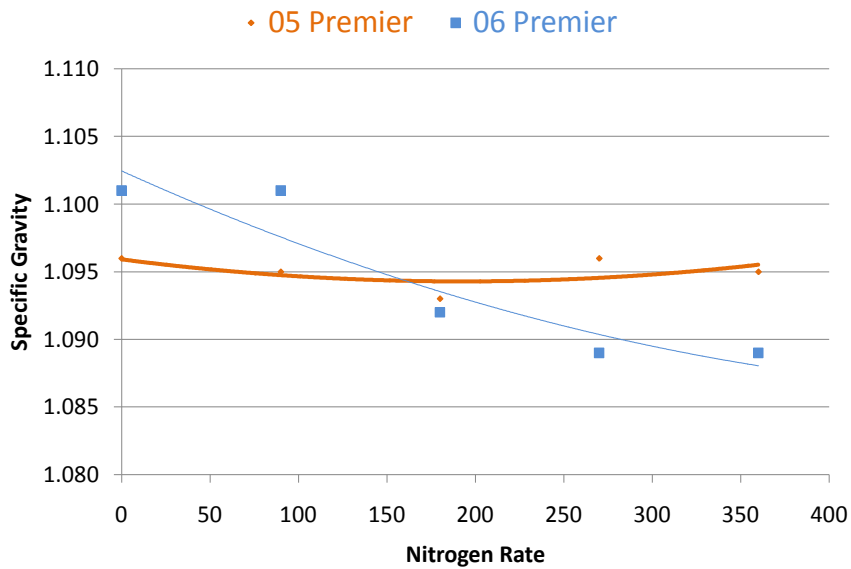
### 2005-2006 Total Yield Response to N Rate of Premier Russet vs. R Burbank



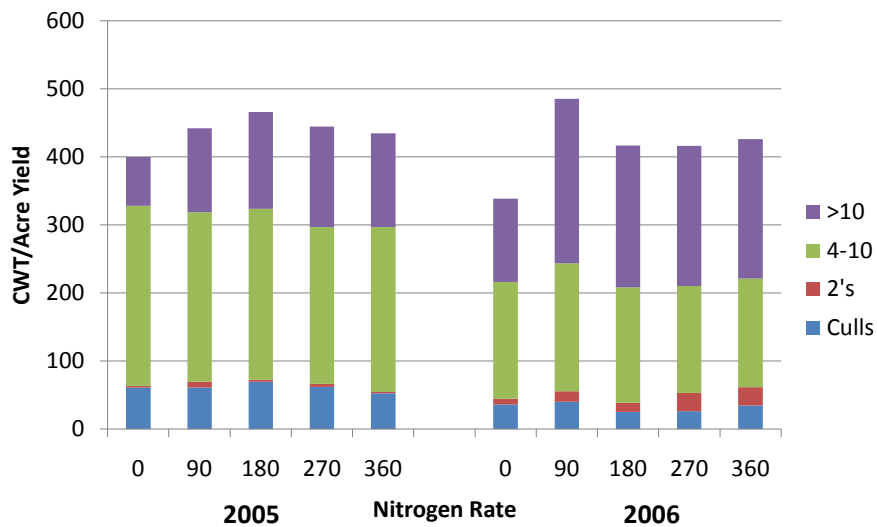
### 2005-2006 USNo.1 Yield Response to N Rate for Premier Russet vs. R Burbank



## 2005-2006 Specific Gravity Response to N Rate



## 2005-2006 Size Distribution - Premier Russet



The proportion of >10 oz tubers increased as N application rates increased from zero to the optimum range, but excessive N application reduced yield and provided no advantage with respect to tuber size.

## Phosphorus

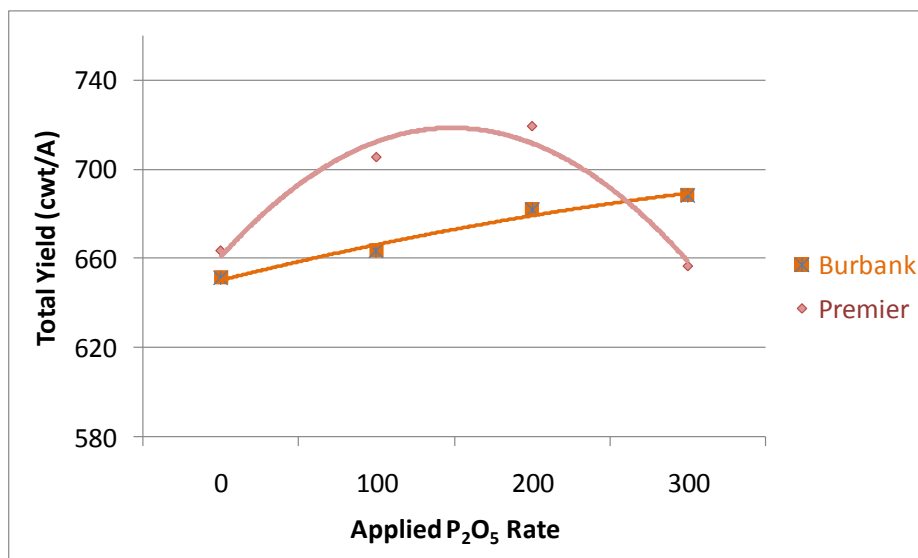
Phosphorus requirements for Premier Russet are about 20-25% lower than Russet Burbank, but Premier is much more sensitive to under and over fertilization with P.

The following fertilizer response curves are for Premier Russet grown on an Owhyee silt loam soil during 2005 to 2007 at the University of Idaho Parma Research and Extension Center. Fields had been out of potatoes at least four years prior planting. Row spacing was 36" and in-row spacing was 10". Grower standard practices were followed for irrigation and pesticide applications.

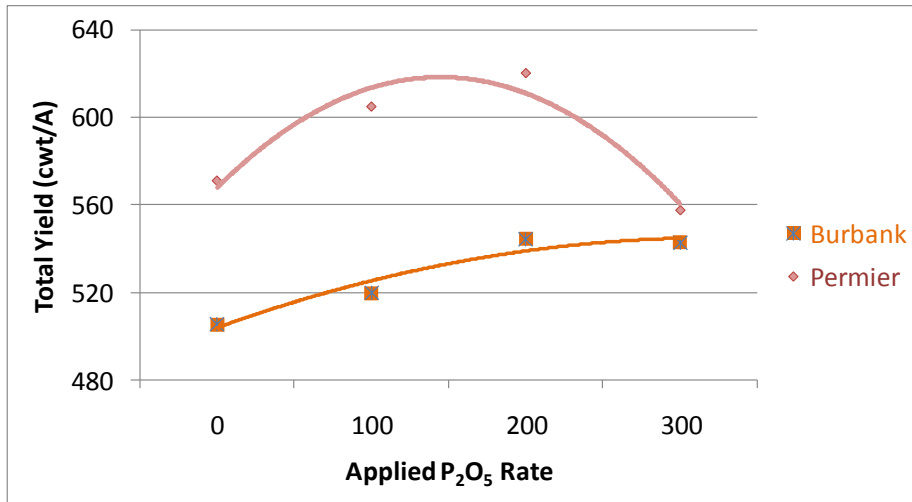
The phosphorus study was conducted using four applications rates (0, 100, 200, 300 P<sub>2</sub>O<sub>5</sub>/acre). All of the phosphorus was applied in the spring as MAP. The P fertilizer, along with enough urea to balance the nitrogen levels, was broadcast and incorporated into the hill at bedding. Preplant soil phosphate levels ranged from 15 ppm in 2005 to 5 ppm in 2007.

Total and USNo.1 Yield response to phosphorus fertilizer application indicates a medium fertilizer requirement compared to Russet Burbank. Inadequate as well as excess levels of P can lower yields and quality of Premier. Observations on plant growth in these trials revealed that early season canopy development of Premier was dramatically slower when soil P levels were too low, resulting in lower yield potential.

2005-2007 Total Yield Response to P Rate of Premier Russet vs. Burbank



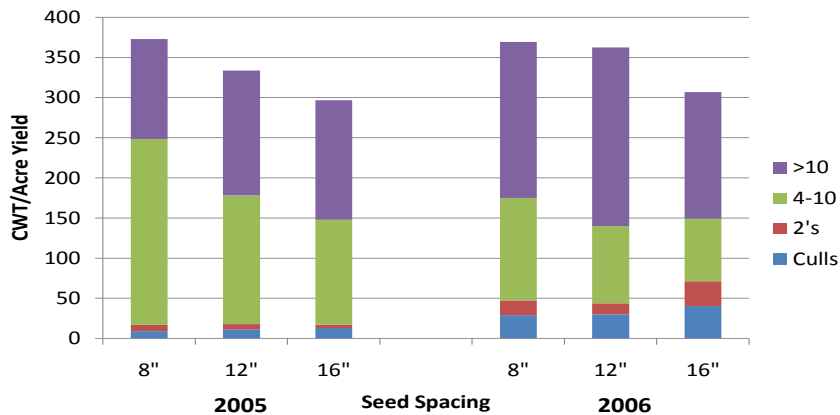
## 2005-2007 USNo.1 Yield Response to P Rate of Premier Russet vs. Burbank



### Spacing

Total and U.S.No.1 Yield of Premier Russet is optimized at the 9-11" in-row spacing. Narrower spacing should be used if excessive size is a problem or in areas where hollow heart is a common problem.

## 2005-2006 Size Distribution - Premier Russet



### Hollow Heart

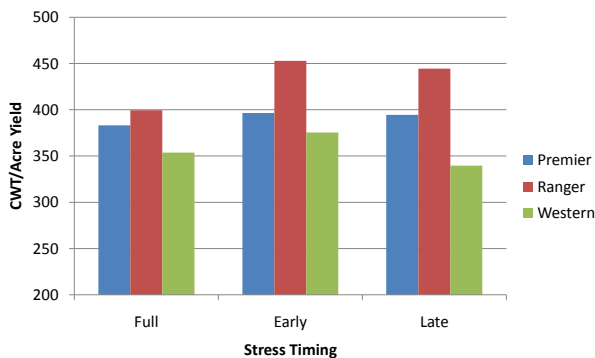
To minimize hollow heart susceptibility, reduce early-season N applications, avoid excessive early season soil moisture, and plant later in the spring if possible.

## Irrigation

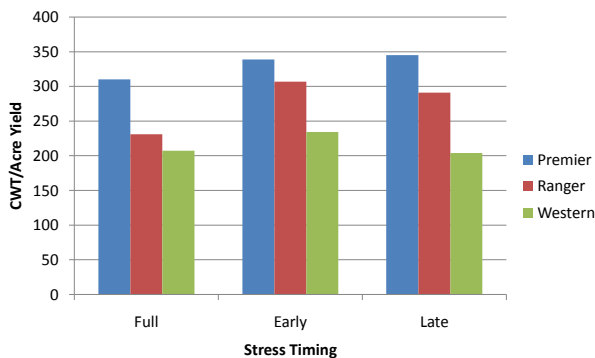
An irrigation stress study was conducted in 2008 to determine the effects of early and late season drought stress on the yield and quality of Premier Russet, Ranger Russet and Western Russet. The study was conducted on a sandy loam soil at the University of Idaho Aberdeen Research and Extension Center. Row spacing was 36" and in-row spacing was 12". Grower standard practices were followed for fertilizer, herbicide, pesticide, and fungicide applications. Trials were irrigated according to 100% ET for the full season treatment; while the early stress treatment received 25% less irrigation during the first 3 weeks of July (during early tuber bulking), and the late stress treatment received 25% less irrigation during last 3 weeks of August (during late tuber bulking).

The following graphs include 2008 yield data for Premier Russet, Ranger Russet and Western Russet. Both Premier Russet and Ranger Russet had higher total and U.S. No. 1 yields with either early or late season drought stress. By comparison, Western Russet had higher yields with early stress but was relatively unaffected by late stress. Early and late stress increased specific gravity for Premier Russet but stress decreased gravities for Western Russet and had a mixed effect on Ranger Russet.

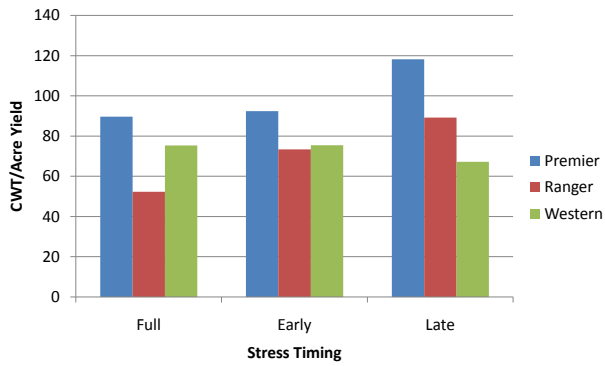
2008 Irrigation Stress Effects on  
Total Yield



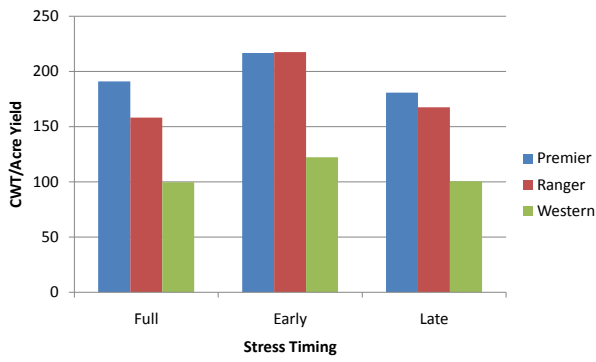
2008 Irrigation Stress Effects on  
USNo.1 Yield



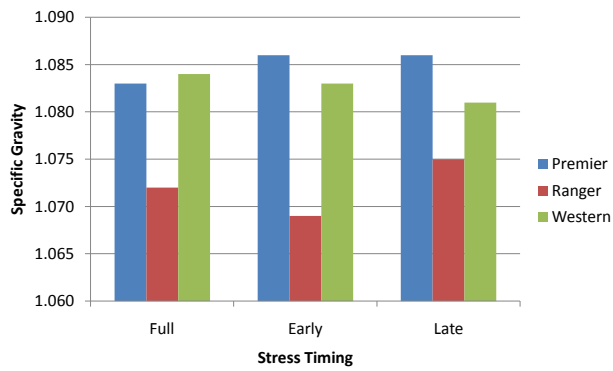
2008 Irrigation Stress Effects on USNo.1 Yield 6-10 Ounce



2008 Irrigation Stress Effects on USNo.1 Yield >10 Ounce



2008 Irrigation Stress Effects on Specific Gravity



## Harvest

Measures may be required to minimize the development of blackspot bruise in Premier Russet. Over-maturation of tubers should be avoided by killing of vines before natural death and timing of harvest to coincide with the minimum period needed to set skin. Soil moisture should be maintained above 60% ASM to prevent tuber dehydration.

## Storage

**Premier Russet has the notable ability to produce excellent fry color out of cold (42°F) storage.** A

University of Idaho Educational Publications document entitled, "Storage Management of A93157-6LS Potatoes" CIS no 1142 contains detailed information on storage, it is available online at

<http://www.kimberly.uidaho.edu/potatoes/CIS1142.pdf>

### Storage Recommendations for Premier Russet

The following recommendations are based on data collected over a three-year period at the University of Idaho Kimberly R&E Center on Premier Russet potatoes grown in Southern Idaho.

**Harvest Conditions:** Premier Russet is susceptible to blackspot bruise, Fusarium dry rot and pink rot. Particular care must be taken to minimize bruising during harvest and handling in order to manage this disease.

**Curing Conditions:** Cure at 55°F and 95% relative humidity for 14 days

**Storage Conditions:** Maintain 95% relative humidity throughout storage. Weight loss is higher in Premier Russet than Russet Burbank.

- **Frozen Processing:** 42°F holding temperature
- **Fresh Market:** 42°F
- **Dehydration Processing:** 42°F

**Sprout Inhibition:** Apply CIPC before dormancy break but after curing

42°F - apply CIPC between 14 and 120 days after harvest

45°F - apply CIPC between 14 and 100 days after harvest

48°F - apply CIPC between 14 and 85 days after harvest

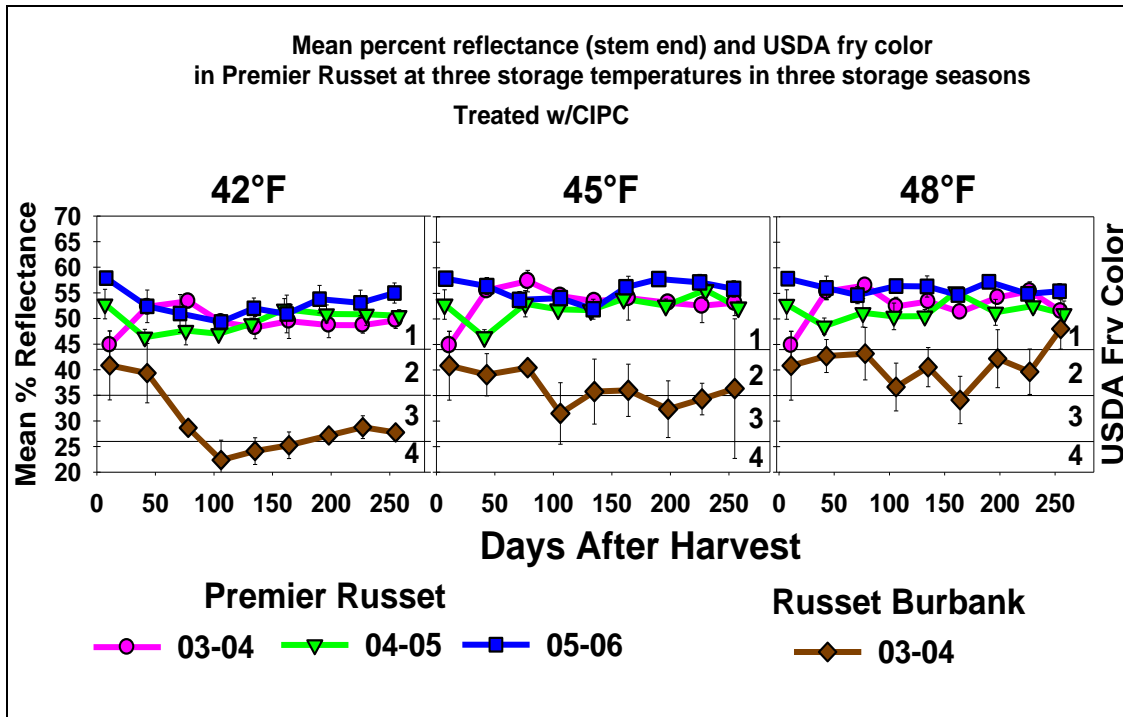
**Due to the fact that this is a shorter dormancy potato, CIPC residues should be monitored to ensure long season sprout inhibition. Research has shown maleic hydrazide applied to Premier Russet in the field has been effective in reducing sprout growth in storage.**

**Duration of Storage:** High processing quality persists throughout 250 days after harvest at 42, 45 and 48°F, although higher tuber shrinkage has been observed in long term storage than we typically see with Russet Burbank.

**Fry Mottling:** Virtually no mottling has been observed in Premier Russet throughout 250 days in storage

**Fusarium Dry Rot:** High susceptibility (more than Russet Burbank), therefore minimize bruising and manage with appropriate fungicides.

**Pink Rot Disease Management:** Trials conducted over a two- year period indicate that phosphorous acid applied as a post-harvest application (at full label rate) going in to storage is effective at controlling the spread of pink rot.



Percent glucose in Premier Russet potatoes in three storage seasons (2003-2006) at three storage temperatures compared with Russet Burbank potatoes in one year (2003-04).

