

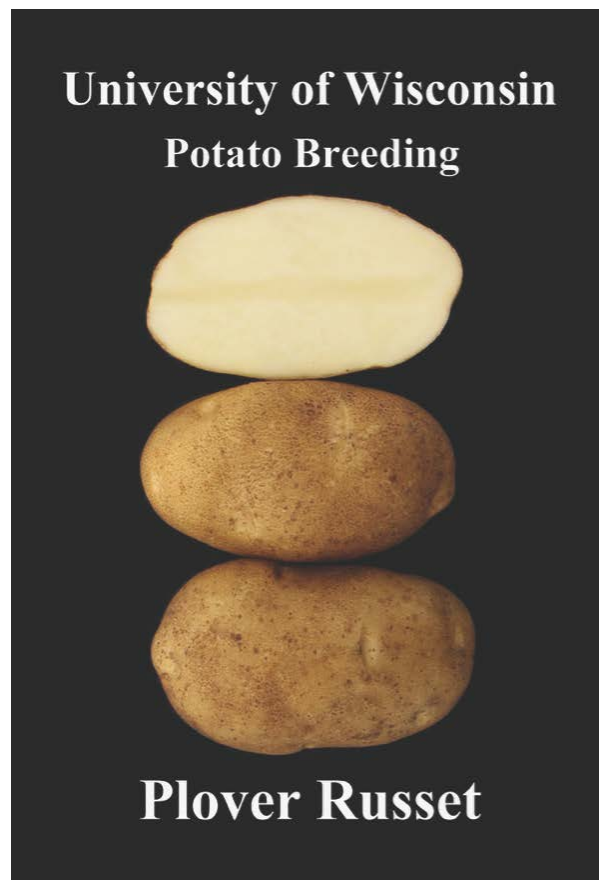
Potato Breeding Report 2019

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Plover Russet

In October 2019, the SpudPro committee voted to assign the name 'Plover Russet' to W9133-1rus, which was originally released to seed growers in 2017. Plover Russet is a fresh market variety with early maturity, light netting and blocky tuber shape. One of its strengths relative to 'Goldrush', which is the current leading variety for the early russet market in Wisconsin, is the high percentage of US #1 tubers. Plover Russet achieves a favorable pack-out because of its large size profile and small percentage of misshapen tubers.



Plover Russet (W9133-1rus)

Parentage: ND4093-4 x CO82142-4RU

Plover Russet is a **fresh market** variety with several incentives for production:

Pack out. Produces a high percentage of U.S. No. 1 tubers due to its large size profile and consistent, blocky shape.

Maturity. Bulks quickly with early to medium vine senescence.

Appearance. Tubers have light, attractive russetting and blocky shape.

Storage. Medium to long dormancy offers the potential for at least six months of storage.

Disease Characteristics

- Susceptible to Verticillium wilt
- More tolerant of common scab than Russet Norkotah but less than Goldrush

W13A11229-1rus

In October 2019, the SpudPro committee voted to begin foundation seed production of the dual-purpose russet variety W13A11229-1rus. The strengths of this clone include

- High yield and large size profile
- Attractive tubers with light russeting and length/width ratio similar to Russet Burbank
- Long dormancy, between Russet Norkotah and Russet Burbank
- High specific gravity, between Russet Burbank and Ranger Russet
- Low glucose levels and light fry color



W13A11229-1rus



Russet Burbank

Figure 1. Slab fry photos, taken at the UW Hancock Storage Research Facility.

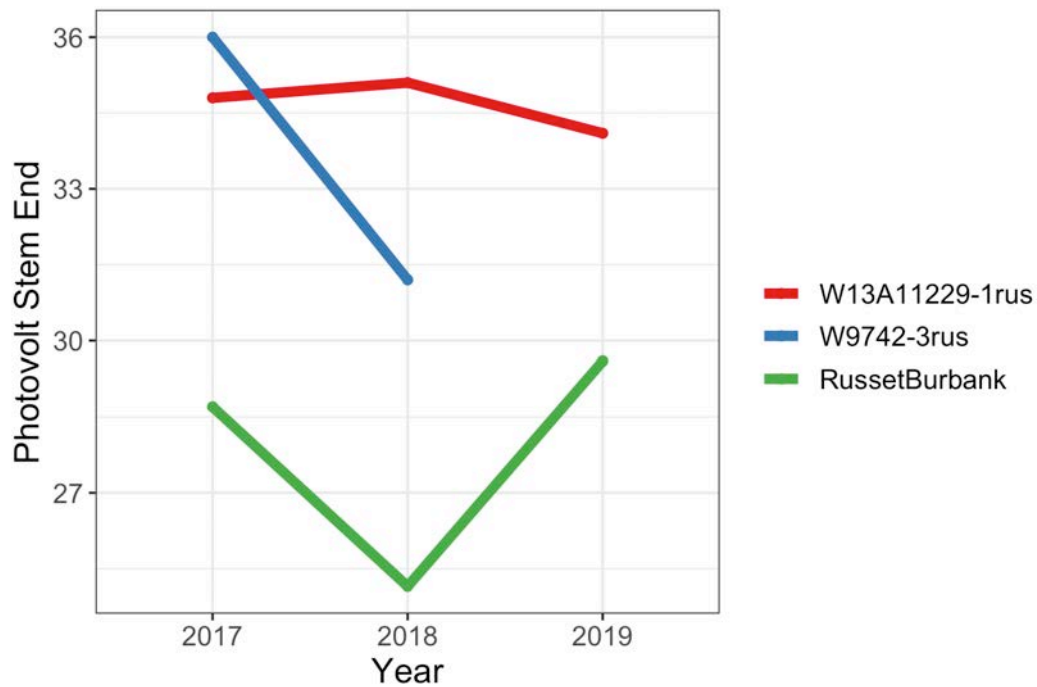


Figure 2. Photovolt readings from the stem end of slabs 1.25 inches wide (see Fig. 1). Trials were conducted at the Hancock Research Station and fried in December.

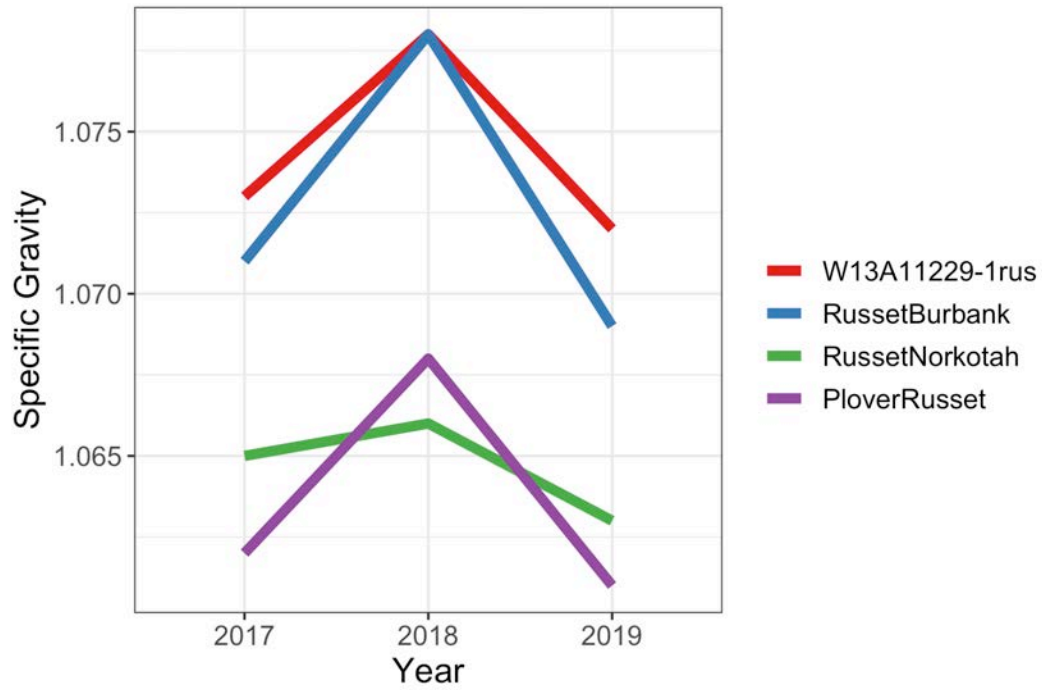


Figure 3. Specific gravity for tubers 6–10 oz. Trials were conducted at the Hancock Research Station.

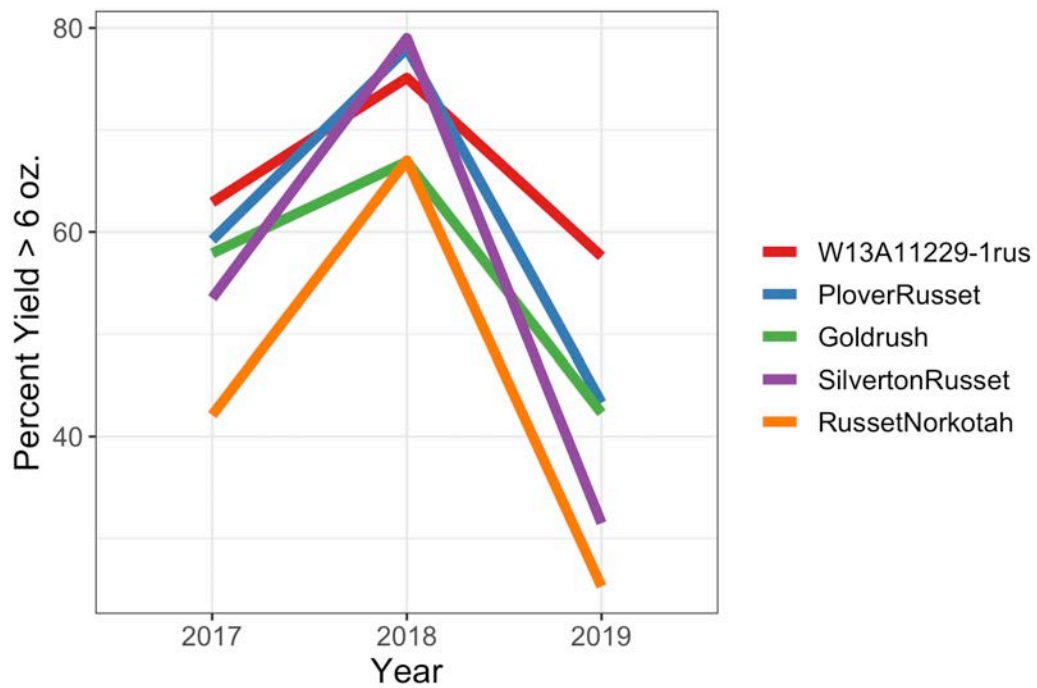


Figure 4. Percent of total yield over 6 oz. Trials were conducted at the Hancock Research Station.

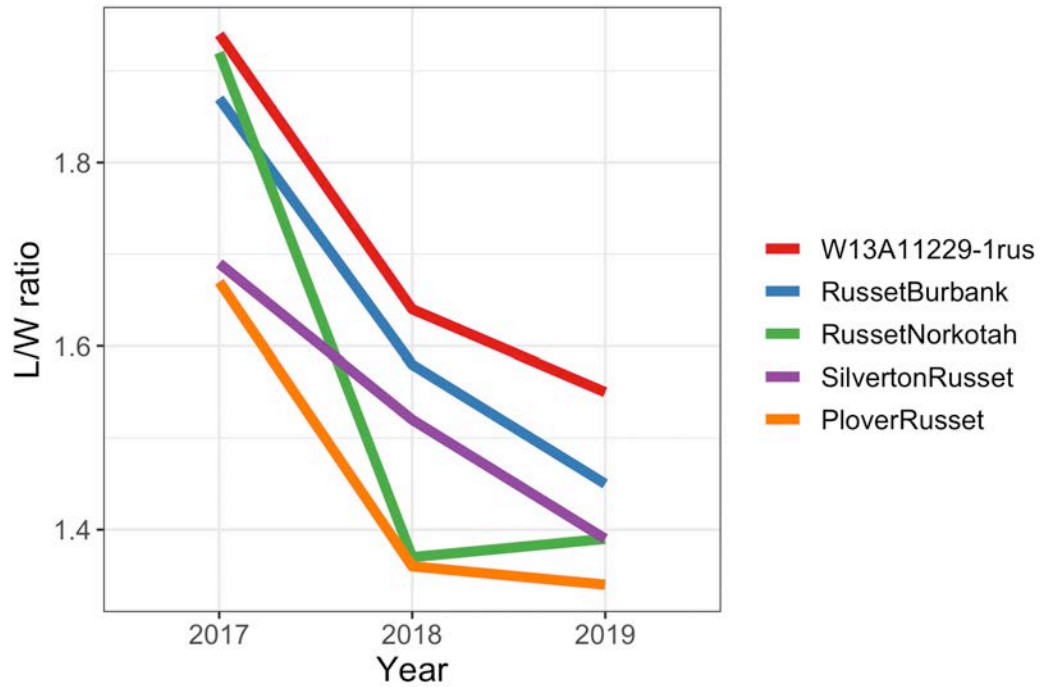


Figure 5. Length-to-width ratio for tubers 4–10 oz. Trials were conducted at the Hancock Research Station.

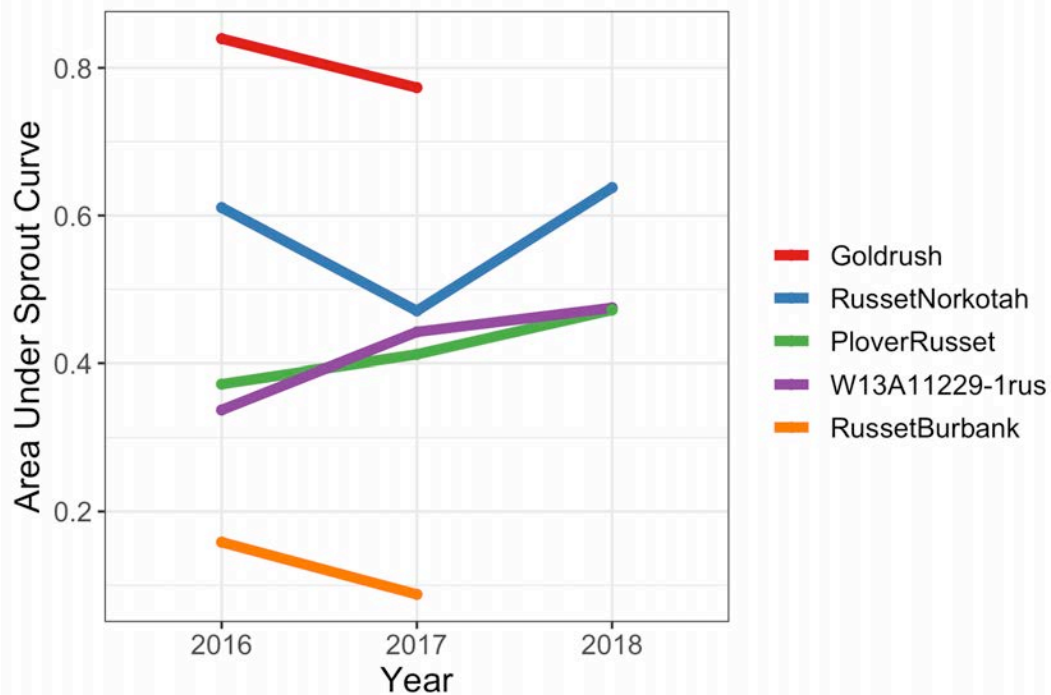


Figure 6. Dormancy of different russet clones, as measured by the relative area under the curve for sprouting at 55°F. Higher numbers correspond to shorter dormancy.

Certified Seed Acreage

Figure 7 shows the 2017–2019 certified seed acreage for UW-Madison varieties released in the past 5 years. Most of the acreage is located in Wisconsin except for Red Endeavor, which is split evenly between WI and Washington state. The chip variety Hodag, which was released in 2015, exceeded 100 acres for the first time in 2019. The upward trajectory of Red Prairie, which was released in 2017, is also notable.

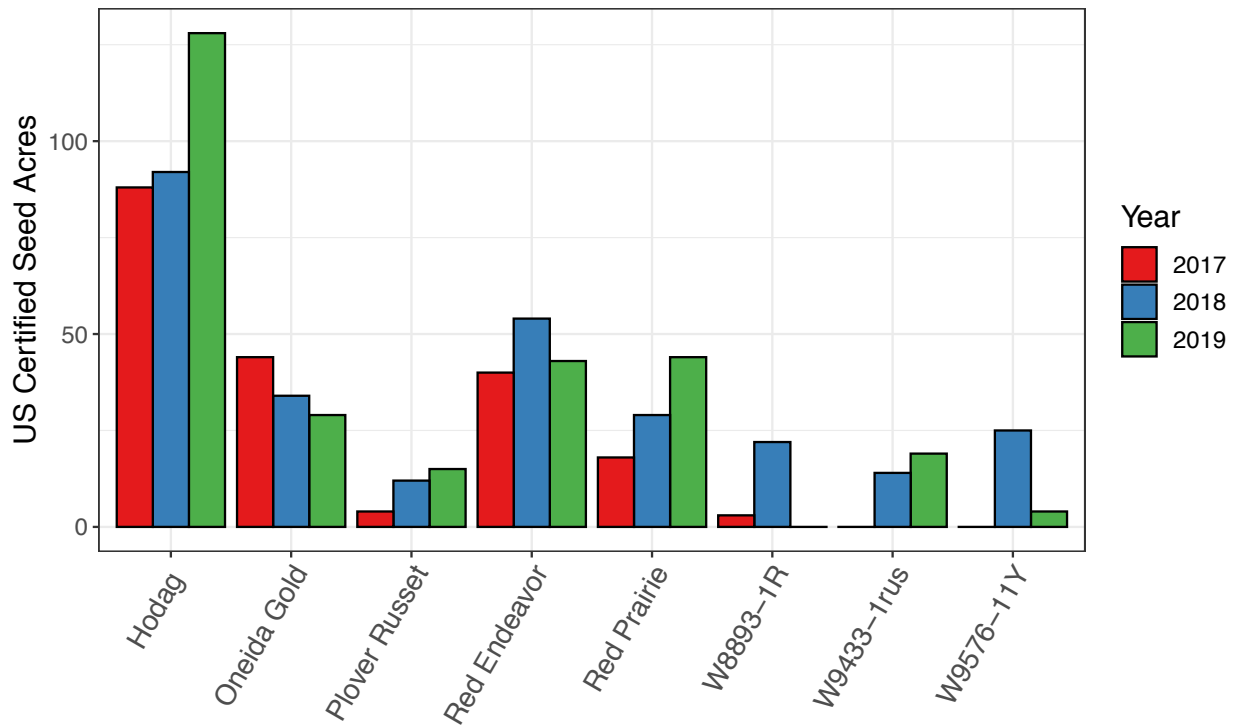


Figure 7. US Certified Seed Acreage for UW-Madison varieties released in the past 5 years.

PVY Resistance

In 2019 we established a new high-throughput genetic testing program for potato based on KASP technology, which allowed us to test over 600 FY2 clones for extreme resistance to PVY and have the results available before harvest. Over 100 clones with extreme resistance were ultimately selected to advance for 2020.

Remote Sensing

In 2019 we began exploring the potential use of remote sensing images to improve the UW-Madison breeding program. Drone flights were conducted at 40, 70, and 100 days after planting (DAP), using a multispectral sensor capable of RGB, NDVI, and NDRE (Normalized Difference Red Edge) observations (Fig. 8).

Figure 8. RGB images illustrating differences in canopy senescence between breeding lines at the Hancock Research Station. Each single-row plot contains a different clone.



One potential use for remote sensing is to replace the visual rating of vine maturity that we normally conduct at 100 DAP. This idea seems promising based on the higher reliability of the spectral indices compared to the visual rating in 2019 (Table 1).

Table 1. Reliability of the visual vs. remotely sensed measurements of vine maturity, taken 100 days after planting at the Hancock Research Station. Reliability is the expected R^2 between the estimated and true values, so higher is better. NDVI = Normalized Difference Vegetation Index. NDRE = Normalized Difference Red Edge.

Trial	Visual Rating	NDVI	NDRE
Reds	0.56	0.54	0.76
Chips	0.53	0.84	0.73
Russets	0.36	0.49	0.66