Payette Russet Management - Idaho

Payette Russet is a full-season variety with higher yields of oblong, medium-russeted tubers having higher protein content than those of the standard russet potato varieties. It has cold-sweetening resistance, low reducing sugars and produces consistently lighter fry color than the industry standard varieties resulting in excellent processing potential. The lower reducing sugar content of Payette Russet also contributes to low acrylamide concentrations in its processed potato products—a desirable trait for processing . Payette Russet also has resistance to tuber malformations and most internal and external defects.

Planting: Payette Russet is late maturing and requires full season production for maximum yield and quality in southern Idaho. For fresh market use, seed pieces should be spaced 9 to 10 inches apart within rows spaced 34-36 inches apart. In-row spacing should be increased to 10 to 11 inches for processing.

Because of its slow emergence, Payette Russet seed should be treated and planted in soil with optimal temperature (45 to 55°F) to facilitate early emergence and minimize the potential for soft rot decay. It is susceptible to Fusarium dry rot, therefore dry rot potential of seed lots should be determined and seed should be treated with an effective fungicide when needed.

Disease Management: Payette Russet has foliar and tuber resistance to late blight, as well as resistance to Verticillium wilt, corky ringspot, early blight, common scab, and PVY. Resistance to PVY has been traced to a resistance gene marker (Ry_{sto}) that confers extreme resistance against PVY strains, with results showing no PVY infection in multiple virus screening field studies. The broad range of disease resistances make Payette Russet a good candidate for reduced pesticide applications.

Herbicide Management: Payette Russet has exhibited good resistance to the herbicide metribuzin when applied at labeled rates.

Fertilization: Total seasonal amounts of soil N plus fertilizer N should be 160-180 lb N/acre for a 400 cwt/acre yield potential, 190-210 lb N/acre for a 500 cwt/acre yield potential, and 220-240 lb N/acre in areas with a 600 cwt/acre yield potential. Petiole nitrate levels for Payette Russet should be about 18,000-20,000 ppm at the end of tuber initiation and decrease to 12,000 to 15,000 ppm during mid-bulking and to 6,000 to 8,000 ppm during late bulking. Nitrogen applications after the first week of August should be avoided to facilitate tuber maturation and skin set. Phosphorus and potassium fertilizer recommendations for Russet Burbank should be followed until recommendations for Payette Russet are available.

Irrigation: Seasonal available soil moisture (ASM) should be maintained within the range of 70 to 85% for optimal yield and quality. Plant water uptake decreases in late August as vines senesce, so irrigation application rates need to be adjusted to maintain ASM at about 60% to 70% to avoid developing excessively wet soil conditions that promote disease. Low soil moisture conditions appreciably below 60% ASM should be avoided during tuber maturation and harvest to minimize tuber dehydration and blackspot bruise.

Vine Kill and Harvest: Irrigation rates should be gradually reduced during the last two weeks prior to vine kill to allow tuber hydration to decrease to an intermediate level during skin set. Vine kill two to three weeks before harvest to maximize skin set and harvest at pulp temperatures below 60^{o}F to reduce storage disease potential. Payette Russet is susceptible to shatter bruise and therefore should be handled as gently as possible to minimize tuber impact damage. Fusarium dry rot control for tubers in storage can also be facilitated by minimizing tuber skinning and bruising during harvest and subsequent handling.

Storage: Payette Russet was tested in the UI Kimberly Potato Storage Trial during two storage seasons (2012-13 and 2013-2014). Two year averages indicate dormancy length for Payette Russet tubers to be 165 days when stored at 42°F, 135 days at 45°F, and 120 days at 48°F. By comparison, dormancy length in Russet Burbank tubers for the same years was 190 days at

42°F, 165 days at 45°F, and 145 days at 48°F. Tuber dormancy length for Payette Russet, therefore, is approximately 20-25 days shorter than Russet Burbank.

Payette Russet has greater susceptibility to Fusarium dry rot and tuber shrinkage and weight loss compared to Russet Burbank, and mitigation of tuber wounding during harvest is important for storage quality. Glucose concentrations in Payette Russet tubers were significantly lower than Russet Burbank in storage and remained acceptable throughout the 9 month storage season at 42, 45, and 48°F at every sampling data over three years of evaluations conducted at Kimberly, ID. Percent reflectance and the corresponding USDA fry color were significantly lighter in Payette Russet than Russet Burbank at 42, 45, and 48°F in all three years tested. Fry color remained acceptable (USDA 2 or lighter) even when stored at the lowest storage temperature of 42°F throughout 9 months of storage in the three years tested. Payette Russet has also been shown to maintain cold-sweetening resistance at high soil temperatures during harvest, when other varieties will oftentimes show a decrease in fry quality.