



VEGETABLE CULTIVAR AND CULTURAL TRIALS 2004

PREPARED BY:
D. WATERER
J. BANTLE
P. HAGEL

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*Department of Plant Sciences
University of Saskatchewan, 51 Campus Drive
Saskatoon, Saskatchewan, Canada, S7N 5A8
Telephone: (306) 966-5855 Fax: (306) 966-5015
E-mail: waterer@sask.usask.ca jmb127@duke.usask.ca*



Agronomy of New Potato Lines

The objective of this trial was to evaluate the performance of a range of newly released potato cultivars under Saskatchewan growing conditions. Changes in yield and quality as a function of crop maturity and irrigation were evaluated in trials conducted on the Plant Sciences Department Potato Research plots located in Saskatoon. The site features a sandy loam, pH 7.8, EC < 1 dS, with 4% O.M. This is the first year this site has been cropped to potatoes - the previous year it was in dryland canola and alfalfa prior to that.

The irrigated trials were planted on May 14 and May 28 and harvested August 16 or Sept 16. This resulted in plots harvested at 80, 90, 105 and 120 days after planting. Separate plots were grown for each planting and harvest date in the irrigated trial. In the dryland trial only a single combination of planting and harvest dates was used - the crop was harvested at 120 days after planting. In both the dryland and irrigated trials, each treatment plot consisted of a single, 8-m long section of row. Each treatment was replicated three times in a randomized complete block design. The rows were spaced 1 m apart with 25 cm between plants within a row. The irrigated plots were watered whenever soil moisture potentials in the hills dropped below -60 kPa. Weed control was achieved through application of herbicides and cultivation.

The early harvested plots had the tops removed by hand a week prior to the harvest. For the 120 day harvest, the plots were sprayed twice with Reglone 10 days prior to the harvest. The crop was machine harvested and then graded into size categories; small = < 44 mm diam., 44 < medium < 88 mm and oversize = > 88 mm diam.

Results

The 2004 growing season was unusually cool throughout. This slowed establishment of the crop but produced excellent conditions during tuber bulking. Consequently yields were relatively high in both the dryland and irrigated trials. 27 cm of rainfall was received over the growing season. A total of 30 cm of supplemental irrigation was applied to the plots. No significant problems with diseases or insects were observed.

Reds - In the irrigated trial, Norland clearly outyielded all other red-skinned lines at all harvest dates (Figure 1 a-d). The only problem with Norland is its tendency to oversize - this was becoming apparent by the third harvest. The yield difference between Norland and AC Peregrine in the irrigated trials was wider than in other years. This may reflect the relatively short and cool growing season experienced in 2004. AC Peregrine is relatively slow to develop and consequently does better in a long growing season. It is interesting to note that in the dryland trial, yields of AC Peregrine and Norland were very similar (Table 1). Both of these lines appear to be quite drought tolerant. Tuber set by AC Peregrine is far higher than Norland resulting in a much smaller average tuber size. In both the irrigated and dryland trials, the performance of the two AAFC lines was much poorer than in previous years. This may be a function of poor seed quality.

Russets - At the early harvest dates in the irrigated trial the new SSPGA line Pacific Russet produced substantially higher yields than the other lines tested (Figure 2 a-d). This new variety appears to size quickly - making it well suited to Saskatchewan's relatively short growing season. By contrast, GemStar is slow to establish, but given a long enough

growing period it appears to have excellent yield potential and acceptable processing characteristics under irrigation. In both the irrigated and dryland trials, GemStar appears to set relatively few tubers and the average tuber size was consequently large. This may be desirable for processors but may represent a challenge in seed production. In the dryland trial which was harvested at 120 days after planting, GemStar was the highest yielding line (Table 1). The AAFC line was not outstanding in any of the categories evaluated in either the irrigated or dryland trials trial.

Table 1. Yield and quality components for Red and Russet potatoes under dryland conditions in 2004.

Line	Yield (t/ha)	Specific Gravity	Avg Tuber Wt. (g)
Reds			
Norland	45.2 a	1.074 c	131 a
AC Peregrine	46.5 a	1.078 b	94 c
CV 89023	26.6 b	1.075 c	106 b
CV 89024	24.4 b	1.080 a	85 c
Russets			
R. Norkotah	37.5 ab	1.084 ab	138 b
R. Burbank	39.6 ab	1.085 ab	140 b
AC Pacific Russet	37.0 ab	1.080 c	152 b
GemStar	43.4 a	1.084 ab	192 a
VO865-1	29.3 b	1.086 a	138 b

Values within columns followed by the same letter are not significantly different (p=0.05)

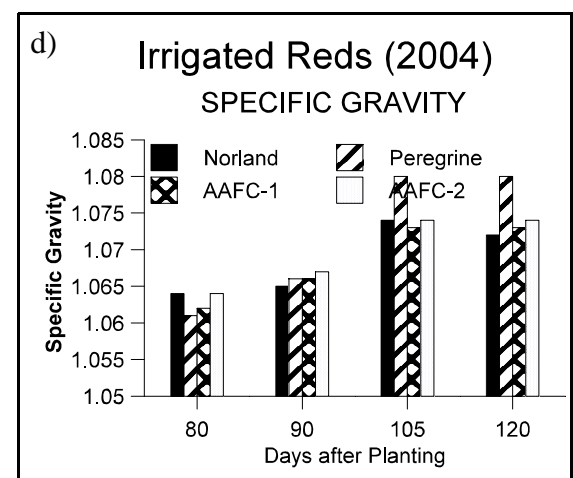
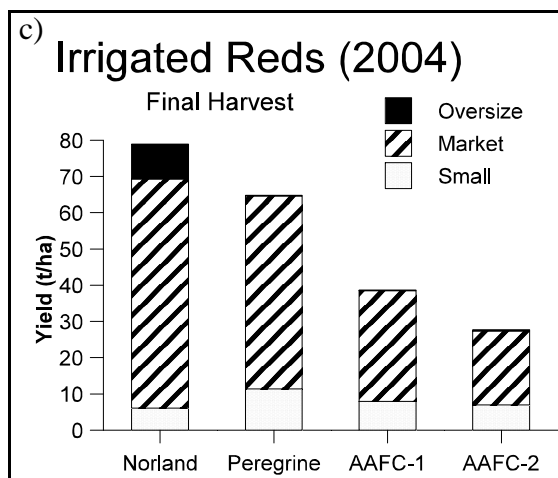
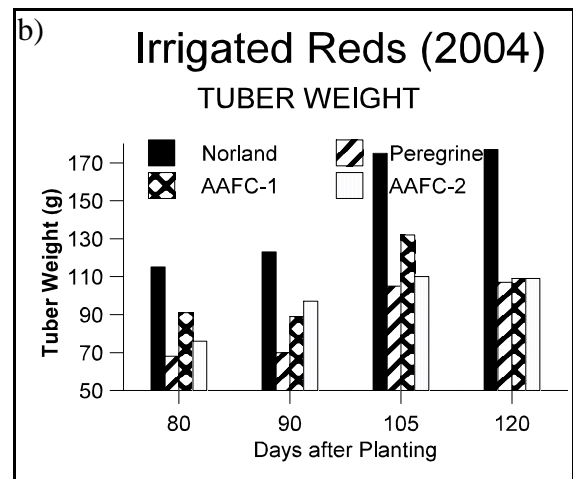
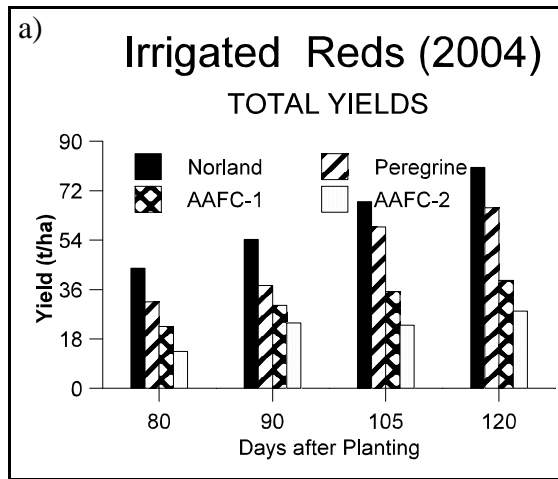


Figure 1 a-d. Yields (a), average tuber weights (b), tuber size profile at the final harvest (c) and specific gravities for various red-skinned potatoes under irrigation.

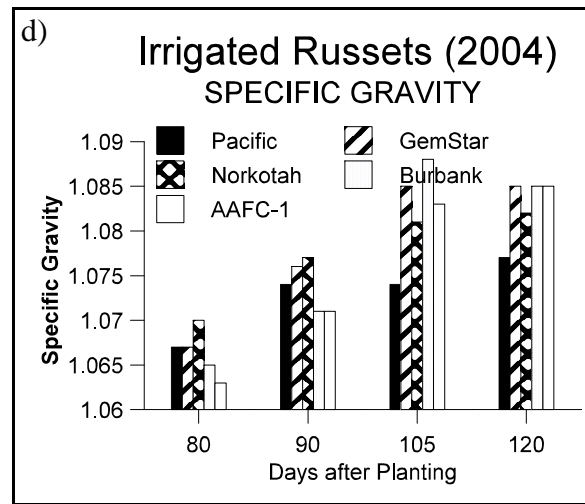
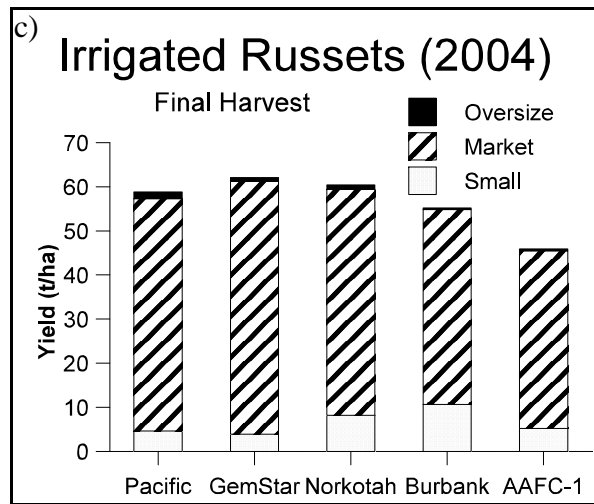
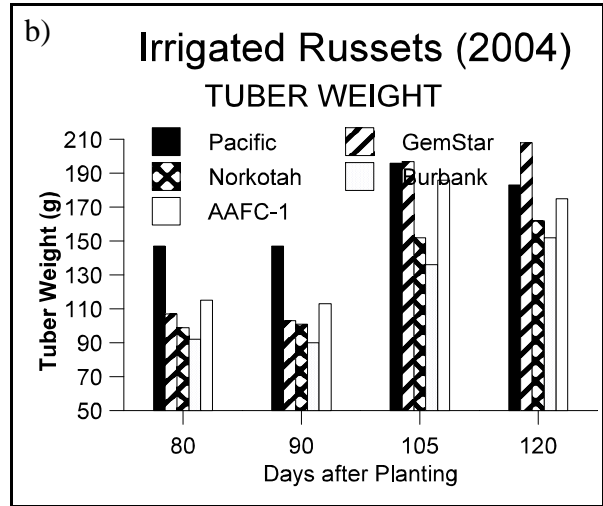
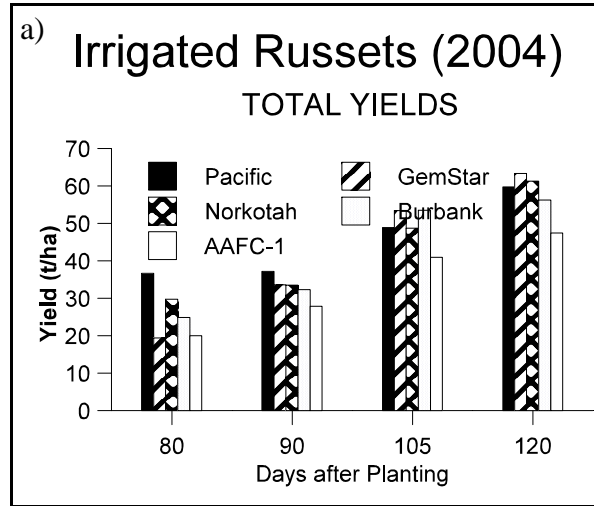


Figure 2 a-d. Yields (a), average tuber weights (b), tuber size profile at the final harvest (c) and specific gravities for various russet-skinned potatoes under irrigation.