UNIVERSITY OF SASKATCHEWAN

VEGETABLE CULTIVAR AND CULTURAL TRIALS 1999

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Agronomics of New Red-Skinned Potato Cultivars

This trial was designed to evaluate some of the basic agronomic characteristics and management parameters required by several newly released **red skinned cultivars** of interest to Saskatchewan's potato industry.

The trials were conducted on the Horticulture Science Department Potato Research plots located in Saskatoon utilizing standard production practices for commercial potatoes. The crop was seeded in mid-May, in rows 1m apart. Irrigated plots were watered once soil water potentials rose above -60kPa. Typically, 2.5 cm of water was applied at each irrigation event. The dryland plots relied solely on rainfall. Yields were evaluated at 90 and 120 days after planting. At both harvests, the crop was graded into size categories; small = < 44 mm diam., 44 < medium < 88 mm and oversize = > 88 mm diam. Table stock yields included the medium and oversize categories while the seed category included the pooled yield of small and medium size tubers.

Cultivars tested;

Norland - is the standard red skinned variety for the Canadian Prairies. It is early maturing with excellent yields of fairly uniform tubers, but its skin tends to fade during storage.

Cherry Red - this Colorado variety is exceptionally red and holds its color well. This variety may be too slow maturing for local growing conditions.

VO498-4 - is a new release from the potato breeding program at Agriculture Canada Lethbridge. This variety has produced excellent yields of very uniform tubers under irrigated conditions but had performed poorly under drought stress.

This trial evaluated the impact of seedpiece spacing on the yields and tuber size distribution of these red-skinned varieties under irrigated and dryland conditions. The spacings tested were 15, 25 and 35 cm (6, 10 and 14"). The 25 cm spacing would represent the norm for Norland under irrigation while a wider spacing would be more typical in dryland production.

Spring of 1999 was cool and wet which delayed crop emergence. Subsequent growing conditions were generally favorable for potato production. Rainfall from planting through July was well above normal. Little irrigation was required until August. Cool temperatures minimized the need for irrigation from September through until the end of the cropping season. Crop vigor was generally good in both the dryland and irrigated trials but more heat would have helped promote yields.

Cherry Red produced a small, upright canopy, while the canopy for VO498-4 more closely resembled that of Pontiac. While the Norland crop had senesced by early September, the Cherry Red and VO498-4 were still growing vigorously at the time of top kill in early September.

Due to the abundant rainfall through until August, yields under irrigation were only marginally higher than those under dryland conditions (Table 1). VO498-4 and Norland had very comparable yield profiles in both the dryland and irrigated trials. By comparison, yields of Cherry Red were consistently poor. The specific gravities (dry matter content) of Cherry Red were considerably different than the other two varieties which suggests that Cherry Red may have unique cooking and handling characteristics. Increasing the plant population by reducing the in-row spacing either increased or had no effect on yields but consistently reduced the average tuber size. At the closest in-row spacing, average tuber size was still large enough to meet table standards.

Table 1a **Yields and tuber size distribution of three red skinned potato cultivars at 90 and 120 days after planting under irrigated and dryland conditions**

EARLY HARVEST - 90 days									
DRYLAND									
	Tablestock (t/ha)					**Seed (t/ha)**			
	15 cm	23 cm	35 cm	L/Q		15 cm	23 cm	35 cm	L/Q
Norland	43.5	35.6	36.0	L/Q		48.5	40.0	40.5	L/Q
Cherry Red	28.1	20.4	20.3	L		33.0	23.6	22.2	L
VO 498-1	40.6	38.5	40.9	NS/NS		46.8	41.2	44.0	NS/NS
LSD 0.05	7.3	7.1	6.5			8.4	6.8	6.0	
IRRIGATED									
Norland	48.5	44.9	45.5	NS/NS		51.4	47.4	46.9	NS/NS
Cherry Red	28.7	22.5	22.0	L		31.9	24.0	22.3	L
VO 498-1	40.6	54.2	45.0	Q		45.4	58.4	46.3	Q
LSD 0.05	6.1	5.4	8.0			5.3	6.0	7.2	
FINAL HARVEST - 120 DAYS									
DRYLAND									
Norland	44.4	43.2	34.7	NS/NS		51.0	47.8	37.9	L
Cherry Red	24.3	25.0	22.7	NS/NS		30.5	28.3	24.8	NS/NS
V0 498-1	41.1	49.0	40.8	NS/NS		48.0	53.5	44.7	NS/NS
LSD 0.05	8.3	8.9	7.1			7.6	7.4	6.6	
IRRIGATED									
Norland	42.1	41.8	35.6	NS/NS		46.5	44.1	38.0	L
Cherry Red	31.9	31.8	26.8	NS/NS		32.5	30.5	24.9	L
VO 498-1	48.9	52.7	42.8	L/Q		52.4	54.5	43.2	L/Q
LSD 0.05	6.4	7.3	6.1			6.1	8.9	6.0	

*Linear (L) or Quadratic (Q) relationship between variable and in-row spacing (P=0.05).

Table 1b **Yields and tuber size distribution of three red skinned potato cultivars at 90 and 120 days after planting under irrigated and dryland conditions**

EARLY HARVEST - 90 days										
DRYLAND										
	Avg. Tuber Wt. (g)						**Specific Gravity**			
	15 cm	**23 cm**	**35 cm**	**L/Q**			**15 cm**	**23 cm**	**35 cm**	**L/Q**
Norland	137	135	138	NS/NS			1.068	1.072	1.068	NS/NS
Cherry Red	123	117	136	Q			1.085	1.078	1.073	L
VO 498-1	132	148	158	L			1.069	1.068	1.074	NS/NS
LSD 0.05	9	18	18				0.006	0.007	0.010	
IRRIGATED										
Norland	143	158	167	L			1.070	1.072	1.067	NS/NS
Cherry Red	159	161	174	L			1.081	1.076	1.078	NS/NS
VO 498-1	136	170	190	L			1.066	1.065	1.068	NS/NS
LSD 0.05	19	38	23				0.007	0.007	0.006	
FINAL HARVEST - 120 DAYS										
DRYLAND										
Norland	126	134	139	L			1.068	1.067	1.069	NS/NS
Cherry Red	113	125	137	L			1.081	1.085	1.082	NS/NS
VO 498-1	132	161	174	L			1.071	1.072	1.072	NS/NS
LSD 0.05	19	18	25				0.006	0.007	0.007	
IRRIGATED										
Norland	137	148	152	L			1.068	1.068	1.066	NS/NS
Cherry Red	159	193	207	L			1.086	1.082	1.081	NS/NS
VO 498-1	156	170	191	L			1.068	1.069	1.067	NS/NS
LSD 0.05	16	34	16				0.004	0.009	0.005	

*Linear (L) or Quadratic (Q) relationship between variable and in-row spacing (P=0.05).