Potato Progress

Research & Extension for the Potato Industry of Idaho, Oregon, & Washington

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Volume XII, Number 4 | *March 23, 2012*

2012 WA Commercial Seed Lot Pick Up &Trial Information

Info also available each year at: **www.potatoes.wsu.edu**

Commercial potato seed samples are requested for the 2012 Washington Seed Lot Trial. **Two to three hundred whole (single drop) seed is an acceptable sample size, or 50 lbs of 4 oz single drop seed.**

Requested: 50 lbs of 2-4 oz whole seed, no seed treatments (Seed over 6 oz is not acceptable)

A representative sample is needed. Sampling the first (or last) 300 seed from the truck is not likely to provide a representative sample of the lot. Sample tags may be obtained by calling (509-765-8845) the Potato Commission or simply stopping by.

Your assistance with collection and drop off of seed samples is needed. Seed samples may be taken to the WSU Othello Research Unit (509-488-3191) located on Booker Road ¼ mile south of State Highway 26 and about five miles east of Othello. For sample pick up and any questions regarding the seed lot trials please call:

South Basin: Tim Waters (509-545-3511), Mark Pavek (509-335-6861), or Zach Holden (509-335-3452).
North Basin: Carrie Huffman Wohleb (509-754-2011), Mark Pavek (509-335-6861), or Zach Holden (509-335-3452).

In the North Basin, one seed "drop-off" has been established. It is located at Qualls Ag Labs (Mick Qualls, 509-787-4210 ext 16) on the corner of Dodson Road and Road 4; come to front office between 8 am and 5 pm. Please call the numbers below to arrange additional pick up sites. Samples will be picked up at 2:00 pm the day before each planting date (below) to be included. Growers planting in early March should drop their samples off at the Othello Research Center or store the samples and call the numbers below for pick up. For all alternative pick up locations or questions please call Mark Pavek at 509-335-6861 or Zach Holden at 509-335-3452.

PICK UP DATES ARE ONE DAY PRIOR TO THE PLANTING DATES BELOW

Seed lot planting dates for 2012 are:	1st (early)	March 27
	2nd (mid)	April 10
	3rd (late mid)	April 24
	4th (late)	May 8

2012 Potato Field Day - Thursday June 28

This year's virus reading of the seed lots will take place on June 12 and 26.

Is Deficit Irrigation Practical for Potato in the Columbia Basin?

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[Extracted from full paper published in: Journal of Crop Improvement, Volume 26, 2012 (in Press)]

INTRODUCTION

Water and nitrogen (N) are important inputs influencing potato to support high yield, quality, and net returns. The response to the above inputs can depend on the cultivar grown and other factors within a production system. Water stress, even for a short period, often has a severe impact on potato tuber yield and quality due, in part, to the shallow root system of the crop. Inadequate water availability results in loss of yield, grade, internal quality, and inefficient use of other production inputs. Negative effects of deficit irrigation (DI) are particularly serious during mid- to late-season tuber bulking.

Effects of water stress are dependent on stage of plant growth. Tuber initiation and bulking stages are the most sensitive to water stress as compared to the vegetative stage. It is important to conduct evaluations on the influence of DI at various growth stages in different production systems. This would be an enormous undertaking to sort out the growth stage specific effects of DI on potato production and quality.

The objective of this study was to examine effects of mild deficit irrigation, began three to four weeks after seedling emergence through tuber bulking stage, on tuber yield and quality of potato cultivars in the lower Columbia Basin.

MATERIALS AND METHODS

Field experiments were conducted in 2004, 2006, and 2007 at the USDA-ARS Prosser - Field Experiment Site in Paterson, Washington, on a Quincy fine sand under a center pivot irrigation system. In the 2004 study, the cultivar used was Ranger Russet, while both Ranger Russet and Umatilla Russet cultivars were used in 2006 and 2007. The irrigation regimes used in this study were: irrigation to replenish full ET (FI) or deficit irrigation (DI). Table 1 summarizes some background information on the experiment.

RESULTS AND DISCUSSION

In 2004, DI resulted in 28% reduction in total tuber yield as compared to that of the full ET irrigation (Fig. 1). Tuber yield reduction due to DI was mainly associated with reduction in large size tubers, i.e. >12, and 8-12 oz. Therefore, the net returns from DI treatment could be considerably lower than that in the full ET treatment.

During 2006 and 2007, irrigation regime also affected total tuber yield and tuber specific gravity. Tuber yield in the DI, as compared to that in the full ET irrigation, decreased by 7.1 to 7.5% and 7.3 to 10.4% across two cultivars in 2006 and 2007, respectively (Fig. 1). In 2007, yield reduction due to DI was greater for Umatilla Russet cultivar (10.4%) compared to Ranger Russet cultivar (7.3%). Tuber specific gravity was greater with deficit irrigation compared to that for full ET irrigation across cultivars in 2006. However, the converse trend was true in 2007 (Fig. 2).

Irrigation regime influenced yield of tubers >12 oz in both cultivars in 2007 (Fig. 3). Yield of tubers >12 oz in the full ET irrigation was significantly greater by 31 and 78% compared to that in the DI treatment, in Ranger Russet and Umatilla Russet cultivars, respectively. However, in 2006 this effect was evident only in Ranger Russet cultivar (27% increase). The general trend was for greater proportion of large size tubers with full ET irrigation compared to that in the DI.

The status of petiole NO_3-N is a good indicator of plant available N during the growing period. The desirable ranges of petiole NO_3-N is dependent on plant growth stage. In both years, petiole NO_3-N concentrations were greater under DI compared to those for plants under full ET irrigation in both cultivars particularly during tuber bulking and maturation stages (Fig. 4). During the tuber maturation stage, petiole NO_3-N concentrations in the DI treatment were above the desirable range of concentrations. This could be attributed to DI may have decreased total aboveground biomass, increasing NO_3-N concentration in petioles, or full ET irrigation may have contributed to decreased availability of N in the rootzone, due to increased leaching of NO_3-N compared to that in the DI treatments. This could contribute to lower petiole NO_3-N in the full ET irrigation treatment.

CONCLUSIONS

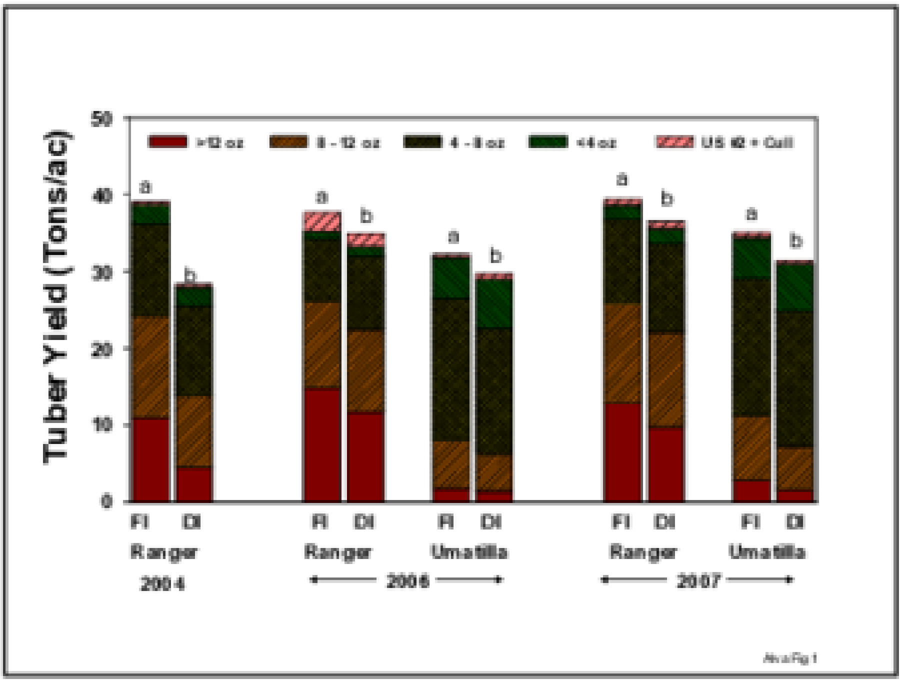
This study demonstrated that 14 to 20% reduction in water application, as compared to irrigation to replenish full ET, resulted in 7 to 28% yield reductions. Therefore, continuous DI, begun three to four weeks after seedling emergence through to tuber maturation stage, had significant effects on tuber yields particularly of large size tubers under high production growing conditions. However, further studies are recommended to evaluate the economic and environmental impacts of full ET irrigation vs. deficit irrigation. Deficit irrigation may be practical only in certain growth stages, which could be somewhat less sensitive to water stress.

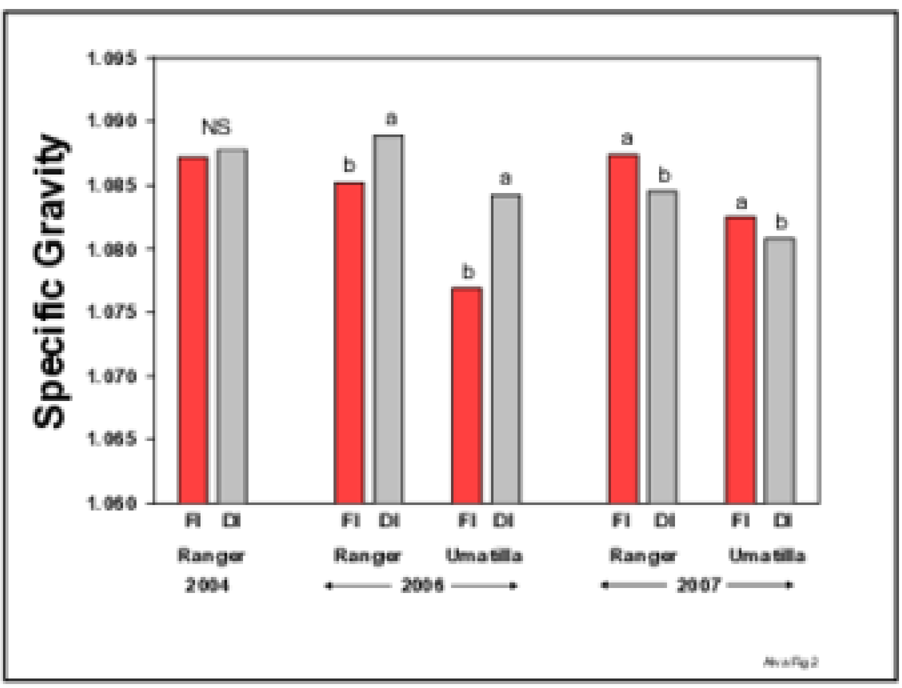
Acknowledgements:

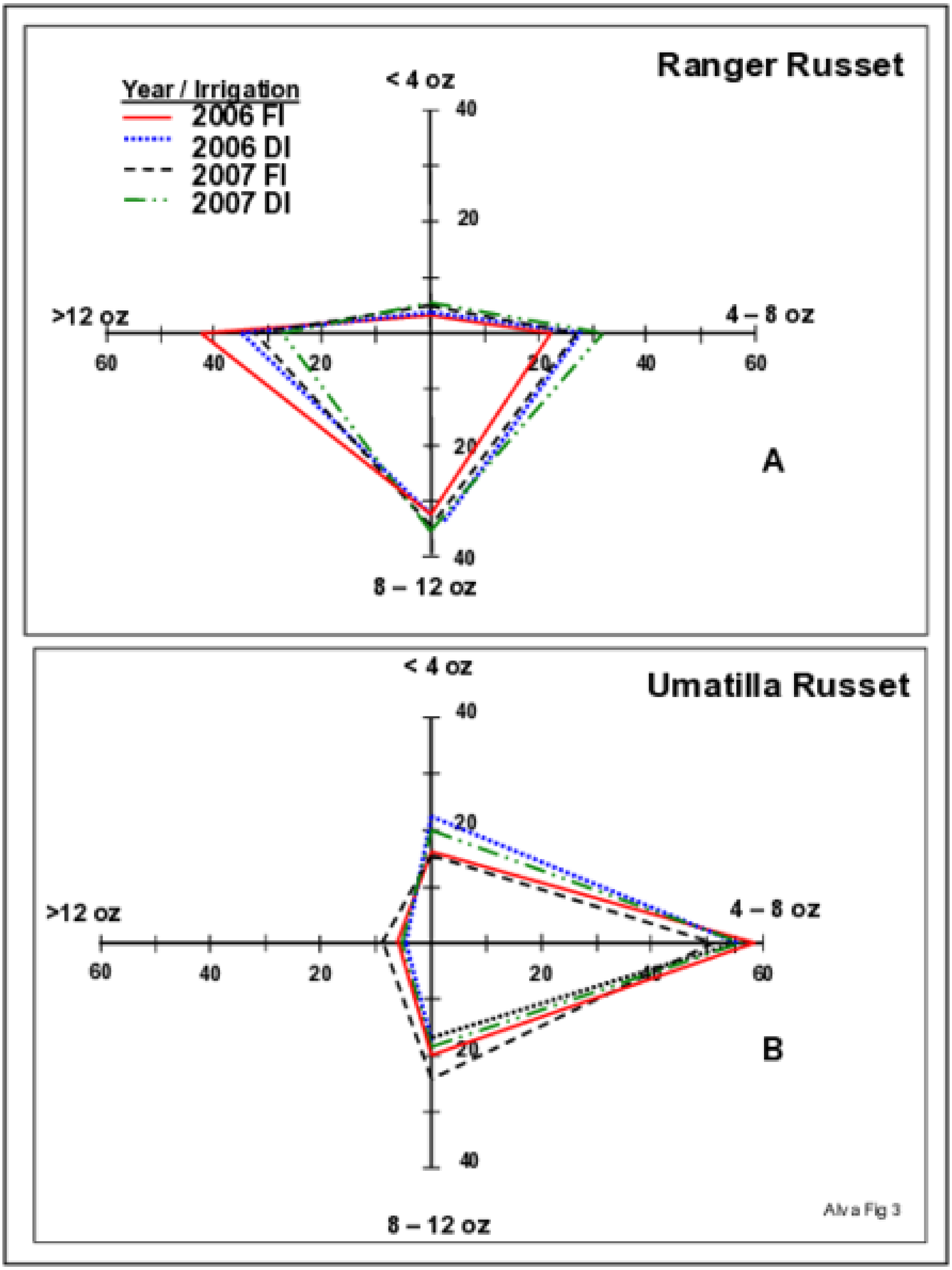
This study was made possible by the generous support of AgriNorthwest Company (Kennewick, WA) by providing: (i) field site, water, field equipment, and major tillage operations support during this project; and (ii) petiole analyses support (Martin Moore).

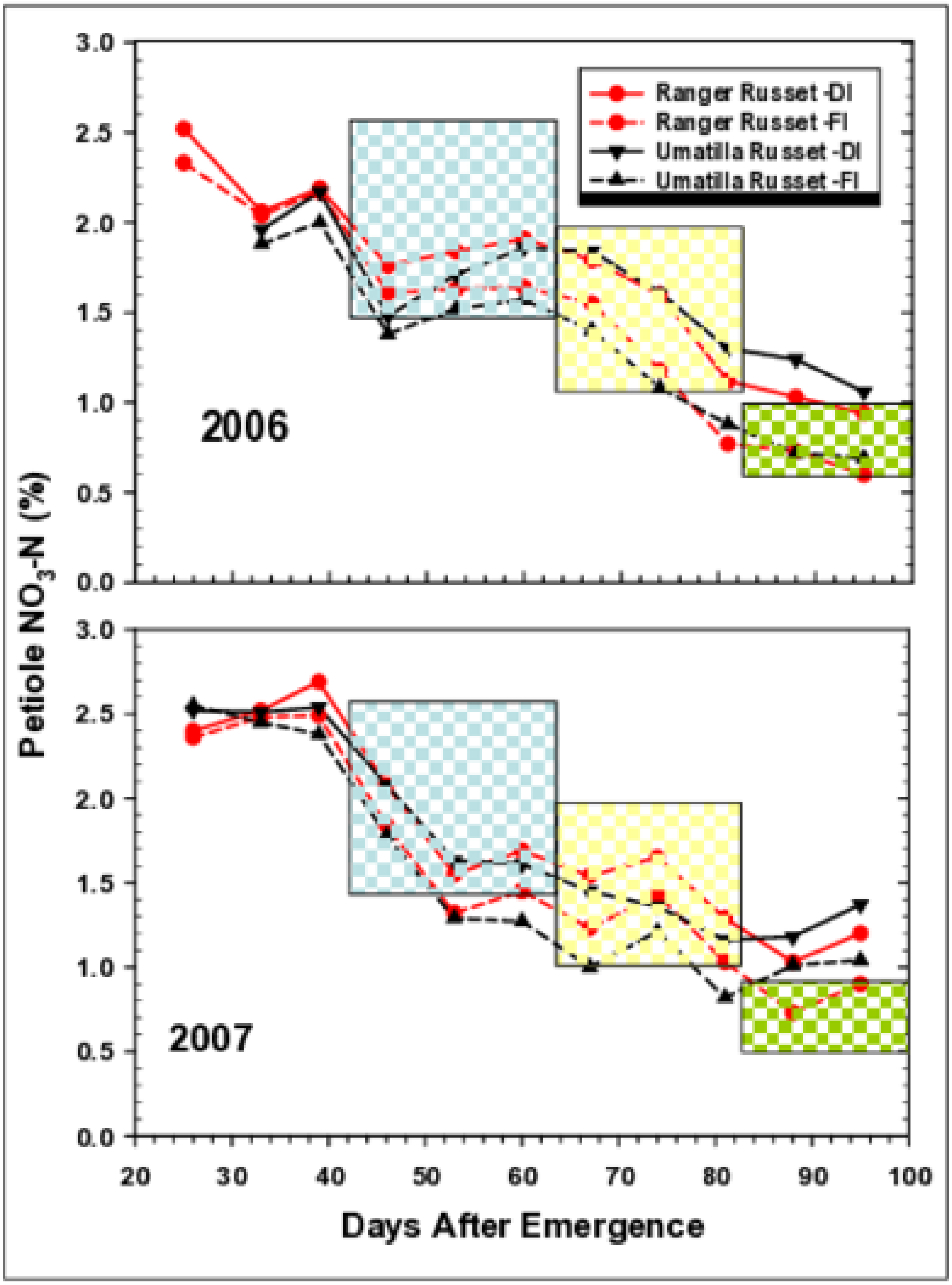
Table 1. Important dates during the potato growing season in Paterson WA, cumulative evapotranspiration (ET) for the growing period and cumulative irrigation for replenishment of full ET and deficit irrigation (DI) treatments.

Parameter	2004	2006	2007
Planting date	March 17	March 17	March 12
Emergence of seedlings	April 19	April 27	April 26
Row closure	June 1	June 5	June 8
Start of DI	May 18	May 26	May 17
Harvest date	September 9	August 28	September 10
	←	(inches)	→
Cumulative ET	28.1	29.2	32.4
Cumulative irrigation for full ET	28.3	28.2	31.3
Cumulative irrigation for DI	22.7	24.2	26.1
Percent Deficit	20	14	17
Cultivars	Ranger Russet	Ranger Russet Umatilla Russet	Ranger Russet Umatilla Russet


Tuber Yield (Tons/ac)
0
10
20
30
40
50
FI DI
Ranger
2004
FI DI
Ranger
FI DI
Umatilla
2006
FI DI
Ranger
FI DI
Umatilla
2007


Specific Gravity
1.060
1.065
1.070
1.075
1.080
1.085
1.090
1.095
NS
FI DI
Ranger
2004
FI DI
Ranger
FI DI
Umatilla
2006
FI DI
Ranger
FI DI
Umatilla
2007


Ranger Russet
Year / Irrigation
2006 FI
2006 DI
2007 FI
2007 DI
< 4 oz
40
20
>12 oz
4 – 8 oz
60
40
20
20
40
60
20
40
8 – 12 oz
A
Umatilla Russet
< 4 oz
40
20
>12 oz
4 – 8 oz
60
40
20
20
40
60
20
40
8 – 12 oz
B
Alva Fig 3


Ranger Russet -DI
Ranger Russet -FI
Umatilla Russet -DI
Umatilla Russet -FI
2006
2007
Petiole NO3-N (%)
Days After Emergence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
20
30
40
50
60
70
80
90
100

Alva Fig 4