EVALUATION OF TWO AUTOMATED IRRIGATION SCHEDULING METHODS FOR DRIP IRRIGATED POTATO

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Most potatoes in the PNW are grown under center pivot sprinkler irrigation

- ✓Can we do just as good a job with drip irrigation?
- ✓Should we schedule drip irrigation for potato with SWT or ET_c ?

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Malheur Experiment Station

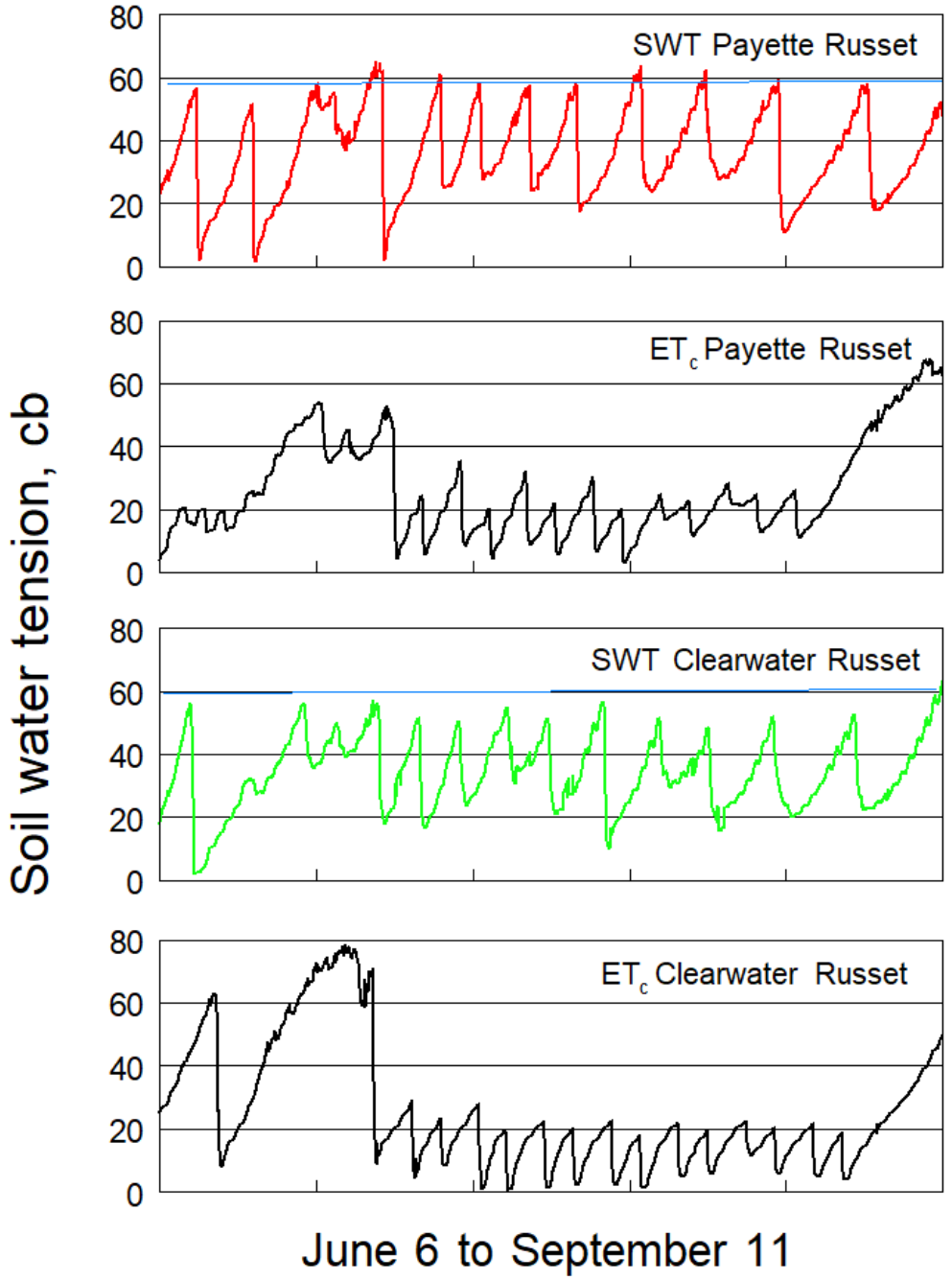
Materials and methods

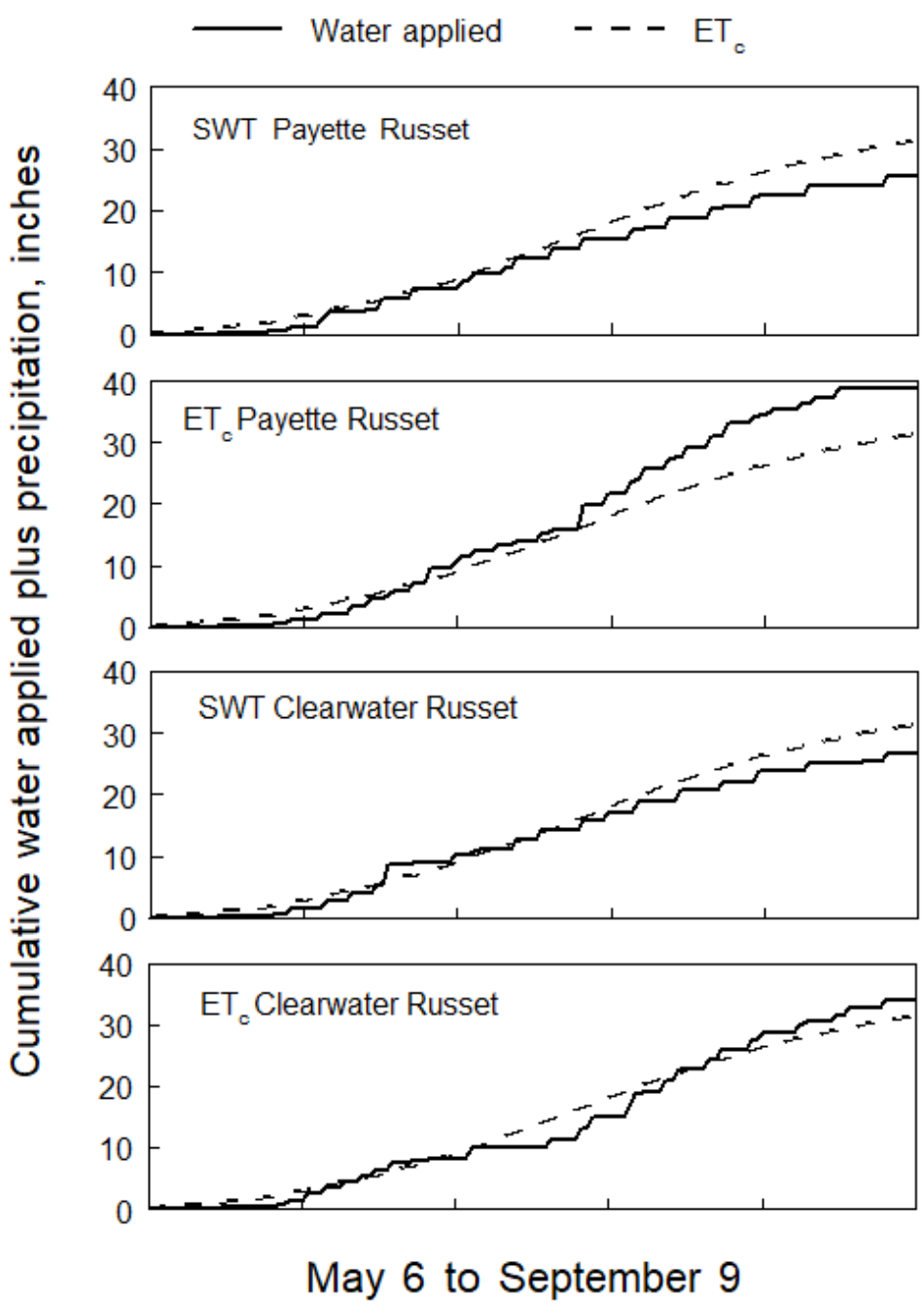
- ✓‘Clearwater Russet’ and ‘Payette Russet’ planted at Ontario, OR in April, 2018, irrigated using drip or sprinklers
- ✓Large plots replicated 6 times
- ✓Careful control of water and nutrients
- ✓Schedule irrigations with SWT or ET_c?

SWT was determined using Watermarks

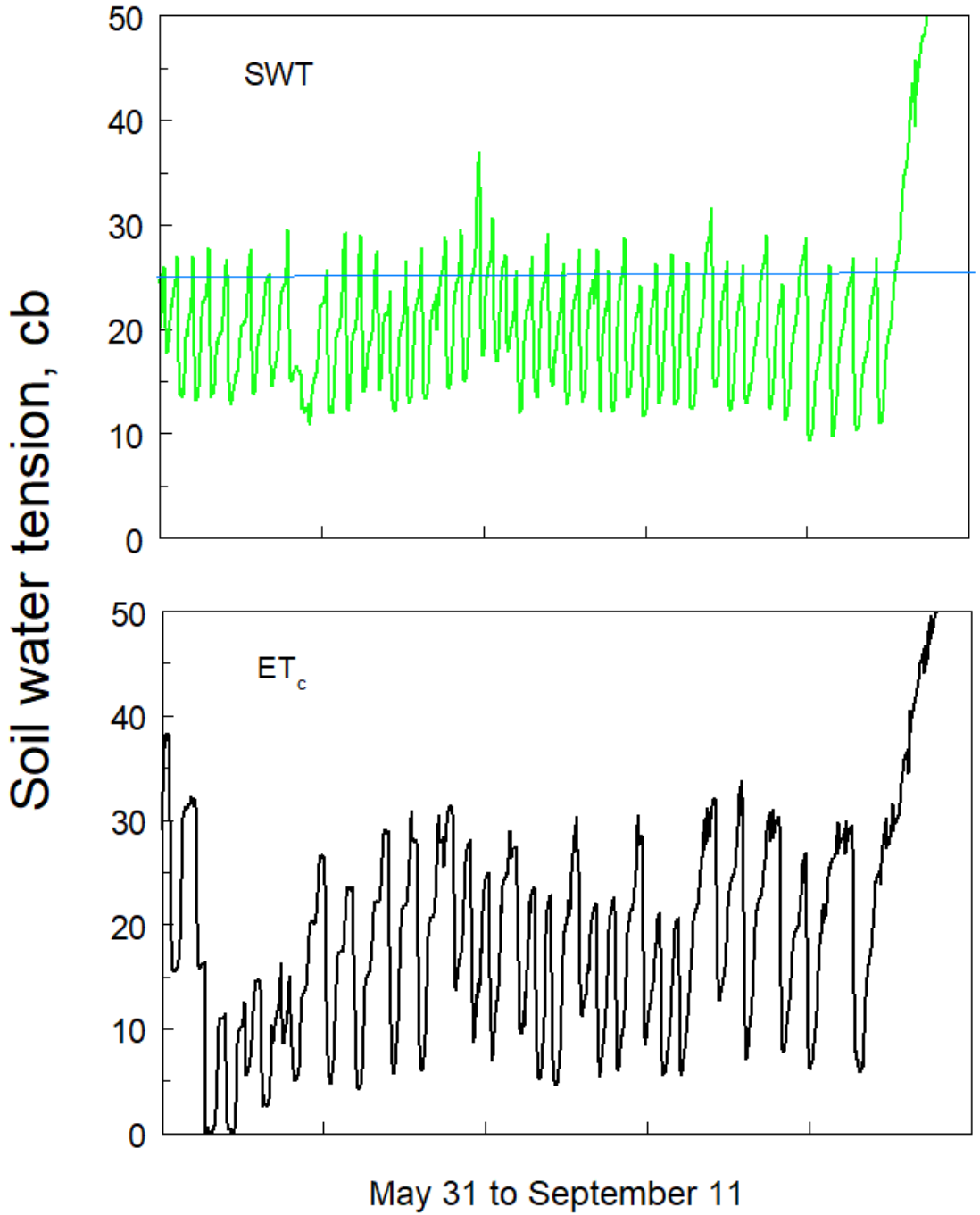
ET_c replacement

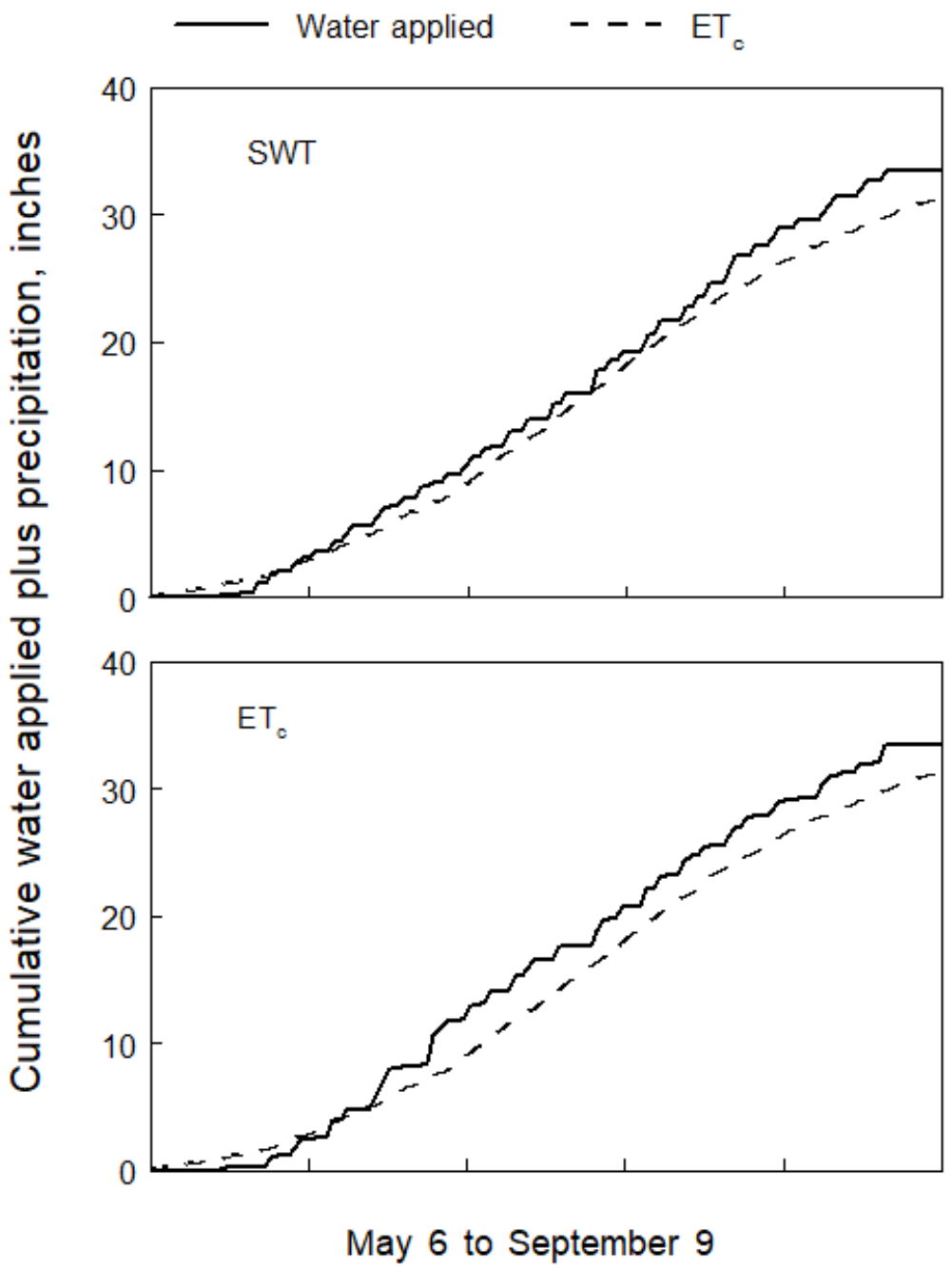
Sprinkler-irrigated potato


Soil water tension, cb
80
60
40
20
0
SWT Payette Russet
ETc Payette Russet
SWT Clearwater Russet
ETc Clearwater Russet
June 6 to September 11


Water applied
ET$_c$
Cumulative water applied plus precipitation, inches
SWT Payette Russet
ET$_c$ Payette Russet
SWT Clearwater Russet
ET$_c$ Clearwater Russet
0
10
20
30
40
May 6 to September 9

Drip-irrigated potato


Soil water tension, cb
SWT
ET c
0
10
20
30
40
50
May 31 to September 11


Water applied
ETc
SWT
ETc
40
30
20
10
0
Cumulative water applied plus precipitation, inches
May 6 to September 9


Clearwater Russet
OSU


Clearwater Russet
Netbeat

EVALUATION OF TWO AUTOMATED IRRIGATION SCHEDULING METHODS, 2018

Irrigation system	Irrigation criteria	Water applied, inches			
Drip	SWT 25 kPa	33.4			
	100 % ET_c	33.5			
Sprinkler	SWT 60 kPa	26.4			
	100 % ET_c	36.5			
Reference	ET_c	31.4			

EVALUATION OF TWO AUTOMATED IRRIGATION SCHEDULING METHODS, 2018

Irrigation system	Irrigation criteria	Water applied, inches	Tuber yield, cwt/acre		
Drip	SWT 25 kPa	33.4	862		
	100 % ET_c	33.5	904		
Sprinkler	SWT 60 kPa	26.4	743		
	100 % ET_c	36.5	802		
Reference	ET_c	31.4			

EVALUATION OF TWO AUTOMATED IRRIGATION SCHEDULING METHODS, 2018

Irrigation system	Irrigation criteria	Water applied, inches	Tuber yield, cwt/acre	Yield response cwt/acre-inch	
Drip	SWT 25 kPa	33.4	862	25.8	
	100 % ET_c	33.5	904	27.0	
Sprinkler	SWT 60 kPa	26.4	743	26.4	
	100 % ET_c	36.5	802	22.5	
Reference	ET_c	31.4			

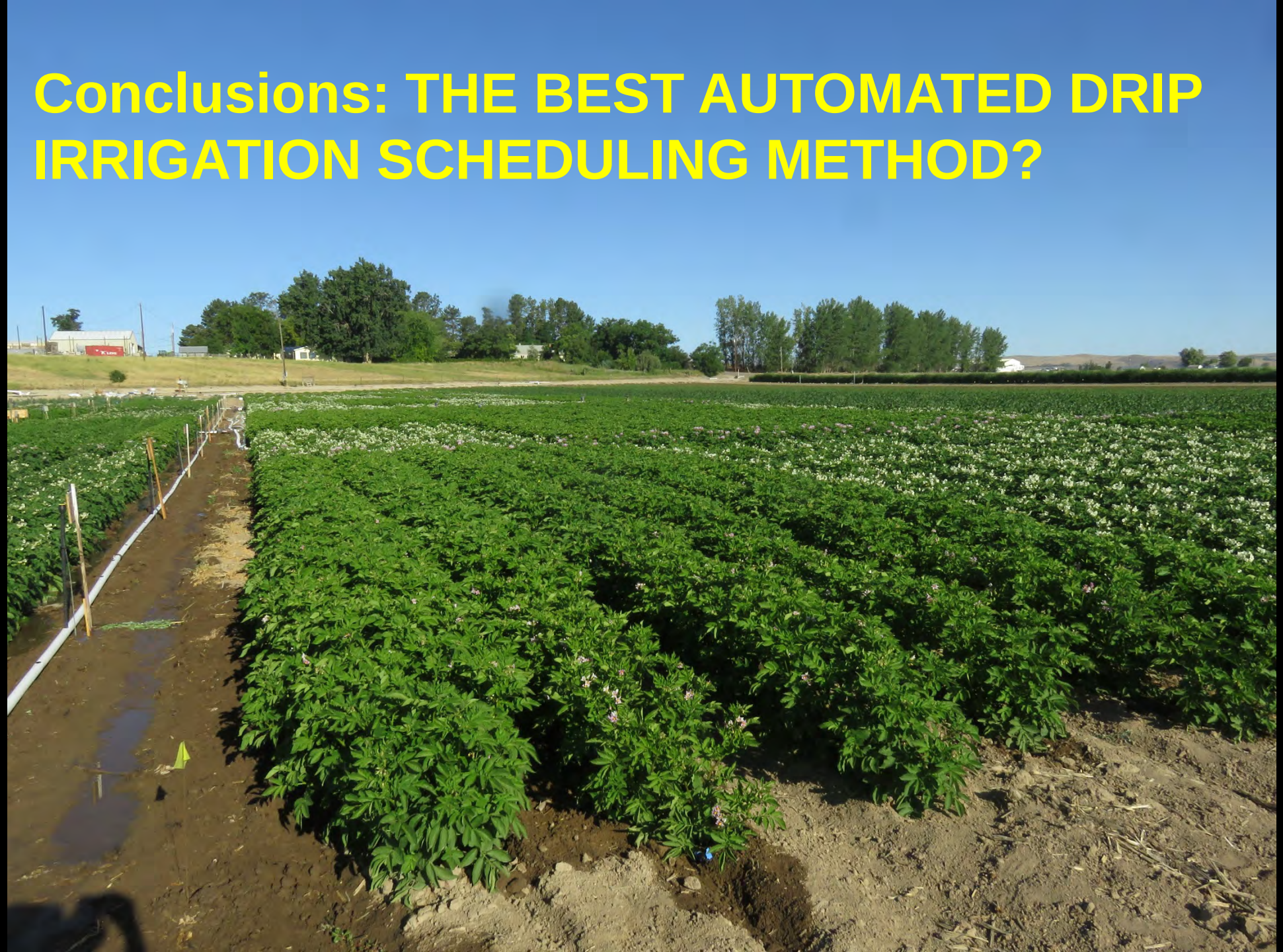
EVALUATION OF TWO AUTOMATED IRRIGATION SCHEDULING METHODS, 2018

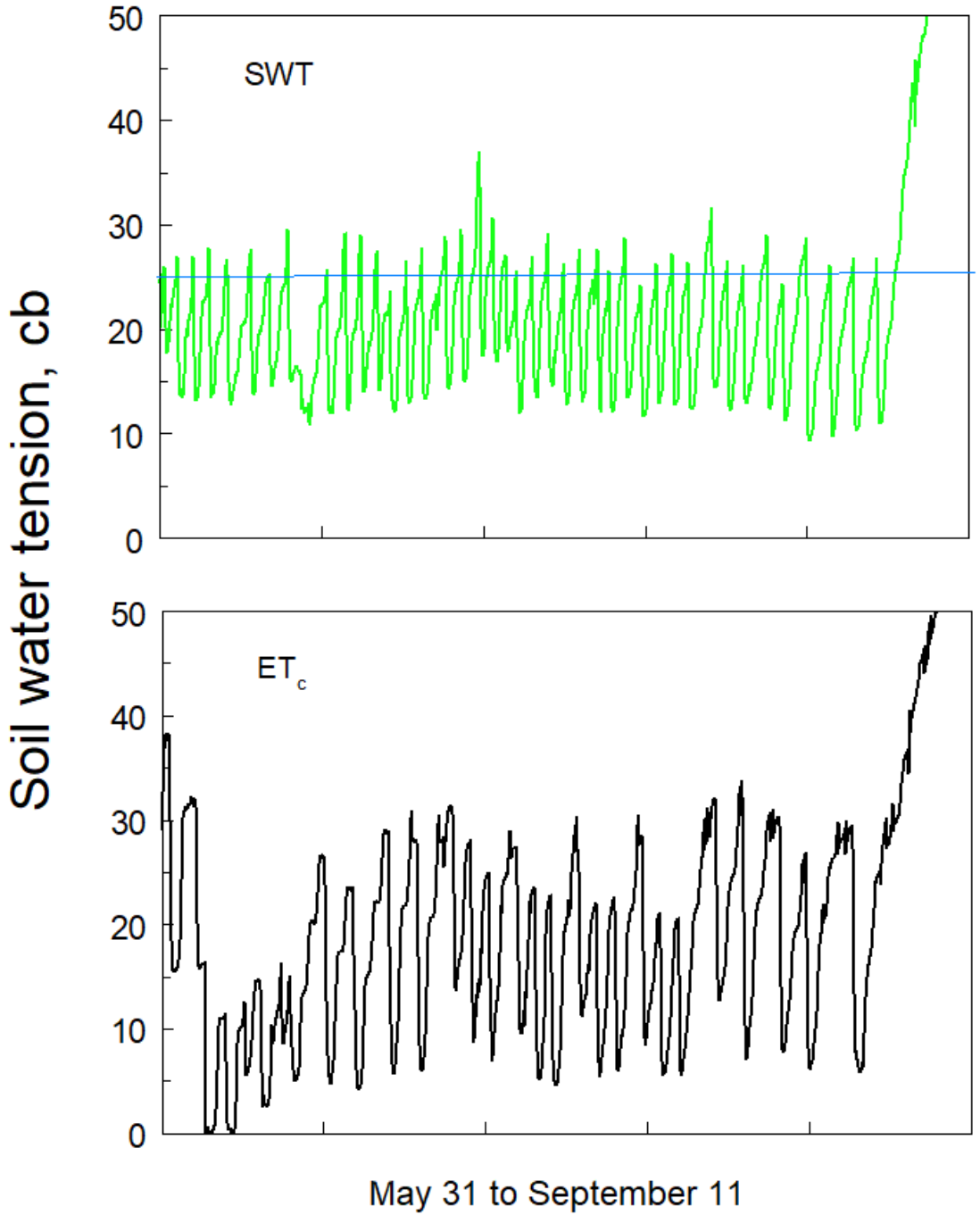
Irrigation system	Irrigation criteria	Water applied, inches	Tuber yield, cwt/acre	Yield response cwt/acre-inch	Number 1 tubers, %
Drip	SWT 25 kPa	33.4	862	25.8	97.3
	100 % ET_c	33.5	904	27.0	97.1
Sprinkler	SWT 60 kPa	26.4	743	26.4	96.4
	100 % ET_c	36.5	802	22.5	93.6
Reference	ET_c	31.4			

Conclusions: Can we do a good job with AUTOMATED DRIP IRRIGATION SCHEDULING

Irrigation system	Irrigation criteria	Tuber yield, cwt/acre
Drip irrigation	SWT 25 kPa	862
	100 % ET_c	904
Sprinkler irrigation	SWT 60 kPa	743
	100 % ET_c	802
Idaho, 2018		450
Oregon, 2018		600
Washington, 2018		630

Conclusions: THE BEST AUTOMATED DRIP IRRIGATION SCHEDULING METHOD?




Soil water tension, cb
SWT
ET c
0
10
20
30
40
50
May 31 to September 11

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Thank you!
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Questions?