



## IRRIGATION TECH SEMINAR SERIES

### **AGENDA: Irrigation with Center Pivots: In the Field at the Fresno State Campus Farm • November 20, 2009**

- |   |  |  |  |
|---|--|--|--|
| <ul style="list-style-type: none"> <li>• 8:30 am</li> <li>• 8:45 am</li> <li>• 9:30 am</li> <li>• 9:40 am</li> <li>• 9:50 am</li> <li>• 10:00 am</li> <li>• 10:15 am</li> <li>• 10:45 am</li> </ul> | <p>Welcome</p> <p>Center Pivot Basics</p> <p>Nozzles</p> <p>Flow Meters</p> <p>Filtration</p> <p>Break</p> <p>Pivot Nozzles and Uniformity</p> <p>Field Trip</p> | <p>Bill Green - CIT</p> <p>Ray Batten- Valmont</p> <p>Craig Stafford - Nelson</p> <p>Tony Pereira- SeaMetrics</p> <p>Steve Johnson- Jain</p><br><p>Ed Norum - CIT</p> <p>Fresno State Center Pivot</p> | <p>Page 2</p> <p>Page 3 - 15</p><br><p>Page 16</p> |
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IRRIGATION SEMINAR SERIES

## Irrigation with Center Pivots

Nov 20, 2009

Presented by:

Dept. of Water Resources (DWR)  
and the Center for Irrigation  
Technology (CIT) at Fresno State



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## Agenda

- 8:30 am Welcome Bill Green- CIT
- 8:45 am Center Pivot Basics Ray Batten- Valmont
- 9:30 am Nozzles Craig Stafford- Nelson
- 9:40 am Flow Meters Tony Pereira- SeaMetrics
- 9:50 am Filtration Steve Johnson- Jain
- 10:00 am Break
- 10:15 am Pivot Nozzles and Uniformity Ed Norum- CIT
- 10:45 am Field Trip Fresno State Center Pivot





# CENTER PIVOT BASICS

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## Center Pivot Basics

Presented by :  
Ray Batten- Valmont


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## Mechanized Irrigation

The Pivot.

California was where several of the original Pivots were installed. Valley Invoice #3 is dated February 24, 1953 for a "Self Propelled Sprinkler" sold to the Irving Williams Company Edison, California (no Zip)


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## Mechanized Irrigation

The Pivot..  
"Water Drive"

- Machines were "High Maintenance" and unreliable.
- Plagued with Alignment and Tracking issues.
- In many cases the customer became the "service department."




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### Mechanized Irrigation

• The Pivot...

**Where Are They**

•Anywhere there is irrigation.

•Approximately 300,000 In North America today.

•Many are 30 years old.



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### Mechanized Irrigation

• Center Pivot Irrigation in California

• Author(s): Tom L. McKnight Source: Geographical Review, Vol. 73, No. 1, (Jan., 1983), pp. 1-14 Published by: American Geographical Society

• It seems reasonable to expect that center pivot irrigation, which has been widely and rapidly adopted in other areas of the United States and in parts of Canada, would have at least equal success in California



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### Mechanized Irrigation

The Pivot...

Nesting Pivots can increase the amount of Irrigated acres.

This view from space shows Watts Brothers Farm in Washington State. They own over 200 Pivots and Irrigate approximately 25000 acres.



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### Mechanized Irrigation

The Pivot..

Offers Growers around the world the opportunity to accurately irrigate and manage a wide verity of crops with less people on the ground than ever thought possible.

Watts Brothers employs less than 20 people in their Irrigation Department.



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### Mechanized Irrigation

- The Pivot...
- Using properly designed Pivot Systems growers are able to Improve Yields, Save Labor, Save Energy, Manage Chemicals Better, Keep Records and **Save Water**.
- The industry is constantly making improvements to existing products and developing new equipment to meet the needs of tomorrow.



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### Mechanized Irrigation

The Pivot..

Control Technology is advancing rapidly. Remote Monitoring and Control of your Pivots is available in a wide scale of products.

- Base Stations
- Internet Access
- Cell Phone and Radio Mobile Access



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### Mechanized Irrigation



Pivots... With Improved Water Application Packages



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Water Where And When You Want It  
Control Runoff  
Adjust to Crop "From Germination to Harvest"



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Quickly Adjust  
Nozzle Package  
As Crop Need  
Changes



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Water Savings = 30 to 55%  
Labor Savings = 50% +



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### Mechanized Irrigation

Pivots.. with improved Tracking and Flotation



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### Mechanized Irrigation

Pivots .....  
With Corner Arms



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### Mechanized Irrigation

Pivots...With DualSpan Technology



The Ultimate Irrigation Management Tool

VALLEY

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### Uniformity



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## IRRIGATION SEMINAR SERIES

### Mechanized Irrigation

- Linear or Lateral Irrigation
- Square and rectangular shaped fields.
- 20 to 320 acres using hose feed or ditch feed supply methods.



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### Mechanized Irrigation

#### The Linear

- The Linear was first used in the 1970's as electricity aided in the development of Reliable Guidance Technology
- The Main trouble has been over extending the acreage the machine needs to cover, "*The driest part of the field is always the furthest from the machine*"



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## IRRIGATION SEMINAR SERIES

### Mechanized Irrigation

#### The Linear

- Excellent Water Uniformity
- Cost Effective on Large Acreages
- Diesel or Power Cord Pull
- Field Alignment by Furrow, Above Ground Cable, Buried Cable and GPS.



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Mechanized Irrigation

Linear Options..

4 Wheel Cart



2 Wheel Cart



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IRRIGATION SEMINAR SERIES

Mechanized Irrigation

Linear Options...

Ditch Feed with Cable Guidance



Hose Feed with Furrow Guidance



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Mechanized Irrigation

Linear Options..

Auto Reversing "Hose Drag Linear"



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## Mechanized Irrigation


Linear Options..

Auto Reversing Elbow



Hose Positioning System







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## Remote Control and Monitoring Options

Basic To Advanced

- Record Keeping
- Reduce Trips to The Field
- Monitor Service Alerts
- Access From Anywhere; Cell Phone / Internet
- Electric Load Management





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# Onions

Lancaster



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# Carrots

Bakersfield



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# Corn

"Real Tall"  
Madera



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# Alfalfa



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# Sugar Beets



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# Potatoes



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# Broccoli



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# PIVOT NOZZLES & UNIFORMITY

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## Pivot Nozzles and Uniformity

Ed Norum  
Center for Irrigation Technology




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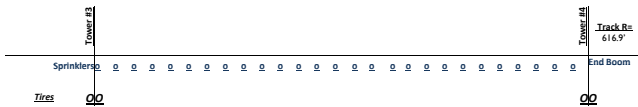
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### Distribution Uniformity Test



Catchment #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	
Catchment Depth (Inches)	.49	.50	.51	.48	.50	.47	.48	.47	.50	.47	.51	.46	.49	CU= 97% DU= 96%
Distance from tire track	5'	15'	25'	35'	45'	55'	65'	75'	85'	95'	105'	115'	125'	
Distance from pivot	487'	497'	507'	517'	527'	537'	547'	557'	567'	577'	587'	597'	607'	
Acres irrigated	.071	.072	.073	.075	.076	.077	.079	.080	.082	.083	.085	.086	.088	
														Pivot Total Area 25.3 acres




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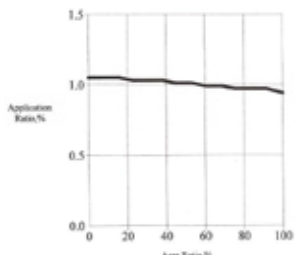
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### Graph of Uniformity Test

Distribution Curve for the 4th span on the Field 6 Pivot



/ Pattern Study, 11/17,2001

