Winnemucca Farms, Inc.

“The Home of Simple Farm Folk”
Map Key
- Interstate 80 (E-W)
- Highway 95 (N-S)
- Union Pacific Railroad (E-W)
- Cities/Towns
- Valmy Power Station (522 MW)

Winnemucca to:
- Valmy: 33 miles
- Elko: 125 miles
- Reno: 165 miles
- Las Vegas: 470 miles
WINNEMUCCA FARMS, INC.

- Established 1972
- Largest single integrated farming operation in NV
- One of the largest in the U.S.
- Total acres available for farming – \( \approx 28,000 \) in two valleys
- Actual farmed in any given year – \( \approx 16,000 \) acres
- 135 pivots with 75 wells
- Main and rotational crops – potatoes; peas; alfalfa; grass and wheat hay; small grains; corn; onions; various seed crops; experimental and soil enhancement cropping
- Worldwide marketing of crops and value added products
It’s Magic, Just Add Water!
“Lord, What Fools These Mortals Be”

-- “Puck”

A Midsummer Night’s Dream
“What Could Possibly Be A Problem?”
No Water

Nada
Zip
Nothing

or
• Precipitation comes at the wrong time and in the wrong form, which leads to —

• Loss of production — Quantity and Quality, or —

• Inability to farm/ranch, but —

• Input costs and maintenance of capital structure continues or increases, and —

• Revenue and profit decrease or cease.

Note: No consideration of the impact of “Crop Insurance” is given here.
“Drought Demands / Forces Change In Business Models — Esp. Agriculture”
• Adopt conservation practices (such has its limits – “A starving man can only fast for so long”)

• Cease / minimize operations

• Change business model – crop patterns and types – i.e. [potatoes vs. alfalfa vs. peas], and –

• Diversify
Winnemucca Farms, Inc.

Searching out and applying the best possible technologies and practices – But Damn They Are Expensive!
• Best practices cultivation and irrigation
• Well meters – all wells
• Ultra-sonic flow meter monitoring
• Variable frequency drives
• Low pressure nozzle replacement every 3 years
• Telemetry systems connections
• Computerized and central control of integrated system
• Aerial and other overhead monitoring
• On site weather tracking
• Pivot mapping and variable rate irrigation
• Bio-fumigants
• “Hands on” sampling by in-house and contracted agronomists
Figure 1.
Graphical representation of how water application rates under a center pivot exceed infiltration rate. Potential runoff is represented by the shaded area.
Senninger Irrigation, Inc
16220 E. Hwy 50
Clermont, FL 34711

Date: 02/06/2012

Dealer:
Nebraska Irrigation-Columbus, NE
Custom Irrigation

Customer:
Winememucca Farms
Pivot #81 - Valley 8000

Comments:
PO3465

Machine
Mfg: Valley
Flow: 800.00 gpm
Pivot Pressure: 48.04 psi
Base Press: 50.00 psi
End Pressure: 38.97 psi
Spacing: Span dependent
Length: 1227.08 ft
GPM / Acre: 7.35 gpm
Average Drop: 10.0 ft
End Gun: No

Pipes
C Factor: 140
Pipe 1: 1201.1 ft, 6.41 inch ID
Pipe 2: 26.0 ft, 5.79 inch ID

Elevation
Difference above(+) pivot 0.00
Difference below(-) pivot 0.00
Elevation Rise included in calculations

Sprinklers
130 XiWob UP3
(23)610 (107)910

Regs
Position: Bottom
130 PSR-15

Spans #8
Gauge 48.04 psi

Diagram:

6.41   5.79
160.9 ft 160.1 ft 160.1 ft 160.1 ft 140.0 ft 140.0 ft 140.0 ft 139.8 ft 139.8 ft 139.8 ft 26.0 ft
8      18      18      18      16      16      16      4     140    140    140    140
140    140    140    140    140    140    140    140    140    140    140    140
Field variability:
Map: DualEM Subsoil
a = 126.1ac
r = 1322ft
Field variability:
Map: DualEM Subsoil
a = 124.8 ac
r = 1316 ft

Mean values by pivot sector

Within sector variability

Sector Position (degrees)

Sector Angle

Variability (%) / Sector
How Does Speed Control Work?

- With Speed Control, your field is divided into a maximum of 180 sectors with optimized water application throughout.
- A customized, uploaded VRI prescription speeds up or slows down the center pivot to achieve the desired application depth across each sector.
- Additional hardware is not needed to upload prescriptions.
- Utilizes your new or existing sprinkler package.

When Should You Use Zone Control?

Zone Control is ideal for those of you who want to maximize your water application efficiency in more challenging fields, such as those with differing topography.

How Does Zone Control Work?

- Your field is divided into more than 5,000 zones with optimized water application in every single zone.
- A customized, uploaded VRI prescription pulses the sprinkler control valves along the center pivot zones to achieve the desired application depth.
- Can also be used for on/off control for areas in your field that don’t need to be irrigated.
- Utilizes your new or existing sprinkler package.
Gallons x1000
699,451.5 Gal
(Jul 29, 2015 11:15 AM)
### Water Applied Depth in Inches: [002] 2

**Report Generated:** 07/29/2015 01:19:59 p.m.

#### Total Water Applied

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Start Angle</th>
<th>End Angle</th>
<th>Water (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-01-2015</td>
<td>08-30-2015</td>
<td>142</td>
<td>185</td>
<td>0.8</td>
</tr>
<tr>
<td>08-01-2015</td>
<td>08-30-2015</td>
<td>185</td>
<td>186</td>
<td>0.3</td>
</tr>
<tr>
<td>08-01-2015</td>
<td>08-30-2015</td>
<td>186</td>
<td>312</td>
<td>0.6</td>
</tr>
<tr>
<td>08-01-2015</td>
<td>08-30-2015</td>
<td>312</td>
<td>142</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1.80</strong></td>
</tr>
</tbody>
</table>

### Water Applied with Chemicals: [002] 2

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Start Angle</th>
<th>End Angle</th>
<th>Chemical (in)</th>
</tr>
</thead>
</table>

### Water Applied with Fertilizer

- 0° (0° - 360°)
- 0° (0° - 360°)

### Water Applied with Other

- 0° (0° - 360°)
### Calculated Values

- **Previous Day Reference ET:** 7.94 mm
- **Cumulative Growing Degree Days:** 3046.20 °C
- **Cumulative Chill Hours:** 215.00 Hr

### PCGW01B301495 - As of Jul 29 at 11:49 AM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Temperature (ALG-3)</td>
<td>27.23 °C</td>
</tr>
<tr>
<td>Air Temperature (SER-1)</td>
<td>28.6 °C</td>
</tr>
<tr>
<td>Humidity (SER-1)</td>
<td>12.8 %</td>
</tr>
<tr>
<td>Rain Gauge (DIG-1)</td>
<td>0.0 mm</td>
</tr>
<tr>
<td>Solar Radiation (ALG-1)</td>
<td>923.34 W/m²</td>
</tr>
<tr>
<td>Wind Direction (SER-1)</td>
<td>NE</td>
</tr>
<tr>
<td>Wind Speed (SER-1)</td>
<td>8.5 km/h</td>
</tr>
</tbody>
</table>
Winnemucca North P-90 Main Farm | 1W3303318

03-01-2015 (12:00 AM) to 07-29-2015 (11:59 PM)

Air Temperature: 35.20 °C

06-29-2015

Daily Reference ET: 7.28 (mm)
Growing Degree Days: 11.65 (°C)
Cumulative Growing Degree Days: 717.10 (°C)
SOLUTIONS?

• Agriculture cannot “conserve” its way out of a prolonged drought

• Water Importation Projects – “When Donald Trump admits to being shy”

• Frequent and repeated requests to the state engineer for rain and snowpack have brought no relief — deeply disappointing non-response.

• Only the grace and mercy of heaven can bring the needed moisture
IN THE INTERIM FOR AGRICULTURE

• Require "Best Practices" in physical transport and use of water
• Encourage conservation by doing away with “water forfeiture” for justifiable non-use of permitted water
• Don’t allow “supplemental” pumping if surface water is available
• Note SB 1894 (California Emergency Drought Relief Act of 2015—Introduced) and H.R. 2898 (Western Water and American Food Security Act of 2015—passed in the House). Senator Feinstein’s SB 1894 calls for, among other actions, new and expanded water storage projects, emergency pumping and accessing the “delta”, and desalination project(s).

• Storage – increase Nevada’s capacity. Adopt Aquifer Storage And Recovery Systems (ASR’s) for efficiency
• Change state management of the “resource”. Adopt a “market based” system that is –
  • Transparent and open
  • Deals with “feast and famine” circumstances
  • Operational and functioning today outside the U.S.
  • “Test project” in Diamond Valley assisted by Prof. Mike Young
Core concepts of a “Market Based” System –
1. Robustness in the sense that the resultant water right, allocation and governance systems are designed to work well during times of extreme stress.
2. Water right and administrative systems characterized by hydrological integrity.
3. **Unbundling** of water rights into their component parts
   a. Rights defined as shares
   b. Separate management of allocations
   c. Conversion of beneficial use requirements into use and works approvals.
4. Electronic access to **water-entitlement registers and water accounts** that define ownership, track water use and allow trading with bank-like certainty.
5. **Efficient risk management of supply risks** so that those who need access to a very reliable water supply have the opportunity, at an appropriate cost, to secure this reliability.
6. **Incentives** that encourage people to search for more efficient ways to use and invest in resources that use water.
7. **Administratively-efficient processes** designed to speed adjustment and keep transaction costs low.
8. A voluntary, **pilot approach** within well-identified geographical boundaries, with exit ramps to protect water rights holders.
9. Legislated plans that address environmental and regional development concerns up-front so that water rights holders and water users can go forward without fear that the courts may once again intervene.
Questions?