California Water Issues

Agricultural Water Use Efficiency and Conservation

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Agricultural Water Management Council
About the Agricultural Water Management Council
California Water Use

Regional Water Use* in California
- Environment
- Farms
- Homes & Business
- Agricultural Area
- Urban Area

* Year 2000

Acre-feet (thousands)
- 49,036
- 26,083
- 7,344

** San Francisco Region outflow includes water that originates in other regions.
California farming...

- 7.3 million irrigated acres
- $38 billion farm gate value
- More than 400 different types of commodities
- 81,700 farms in California
California farming...

- Average irrigated farm is small, only 162 acres
- $11,100/acre irrigated, $3,500/acre dryland
- Surface water prices vary greatly, from less than $10/af to in excess of $450/af.
California farming...

<table>
<thead>
<tr>
<th>Commodity</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk and Cream</td>
<td>6,924,121</td>
<td>4,537,171</td>
<td>5,928,150</td>
</tr>
<tr>
<td>Grapes, All</td>
<td>2,923,015</td>
<td>3,260,172</td>
<td>3,201,112</td>
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<tr>
<td>Almonds (shelled)</td>
<td>2,343,200</td>
<td>2,293,500</td>
<td>2,838,500</td>
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<tr>
<td>Nursery</td>
<td>2,726,160</td>
<td>2,510,290</td>
<td>2,744,900</td>
</tr>
<tr>
<td>Cattle &amp; Calves</td>
<td>1,884,660</td>
<td>1,676,375</td>
<td>2,089,194</td>
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<tr>
<td>Berries, All Strawberries</td>
<td>1,578,175</td>
<td>1,725,232</td>
<td>1,796,574</td>
</tr>
<tr>
<td>Lettuce, All</td>
<td>1,580,831</td>
<td>1,743,573</td>
<td>1,642,249</td>
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<tr>
<td>Tomatoes, All</td>
<td>1,317,321</td>
<td>1,539,923</td>
<td>1,274,213</td>
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<tr>
<td>Pistachios</td>
<td>569,900</td>
<td>592,850</td>
<td>1,158,840</td>
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<tr>
<td>Walnuts</td>
<td>558,080</td>
<td>747,270</td>
<td>1,061,330</td>
</tr>
<tr>
<td>Flowers and Foliage</td>
<td>1,060,489</td>
<td>936,689</td>
<td>1,012,221</td>
</tr>
<tr>
<td>Hay, All</td>
<td>1,797,032</td>
<td>926,660</td>
<td>971,090</td>
</tr>
<tr>
<td>Rice</td>
<td>826,144</td>
<td>936,958</td>
<td>789,003</td>
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<tr>
<td>Chickens, All</td>
<td>724,667</td>
<td>691,518</td>
<td>721,724</td>
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<tr>
<td>Oranges, All</td>
<td>558,974</td>
<td>595,909</td>
<td>716,059</td>
</tr>
<tr>
<td>Cotton Lint, All</td>
<td>296,531</td>
<td>285,797</td>
<td>610,042</td>
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<tr>
<td>Broccoli</td>
<td>663,319</td>
<td>750,600</td>
<td>606,082</td>
</tr>
<tr>
<td>Carrots</td>
<td>517,663</td>
<td>499,766</td>
<td>525,858</td>
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<tr>
<td>Avocados</td>
<td>328,350</td>
<td>200,640</td>
<td>414,948</td>
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<tr>
<td>Celery</td>
<td>354,979</td>
<td>389,141</td>
<td>380,974</td>
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</tbody>
</table>
Basic Areas of Ag Water Issues

- Supply Issues
  - Stability
  - Infrastructure Management
  - Meeting the changing demands

- Demand Issues
  - Demand Hardening
Statewide Supply Issues

- Instability of Surface Water Supply
- Natural Variability (Normal CA)
- Changes in System Operations
  - Storage Operations Changes
  - Diversion Changes
Statewide Supply Issues

• Instability of Surface Water Supply
The Sacramento-San Joaquin River Delta

• Critical to California’s Water Supply

• Home to 5 listed endangered species

• Critical, but heavily engineered ecosystem
Statewide Supply Issues

- Largest estuary on West Coast
- Over the past 150 years, 1,000 miles of levees built to create islands
- 95% of wetlands disappeared
Delta Smelt

Salmon
Supply Issues

• Infrastructure Management
  • Diversion Pumps
  • Reservoir Dams
  • Levees
Peripheral Canal
Demand Issues

• Agricultural Water Needs are “Hardening”

CA cropping pattern shifting toward permanent plantings
What about Water Use Efficiency?

• California’s legislature has directed the Department of Water Resources to develop a method to quantify the efficiency of agricultural water use.

• Leaving aside the legal process, how can we help to:
  • Improve water supplier delivery efficiency?
  • Improve grower efficiency? (Distribution Uniformity, etc.)
Water Supplier Efficiency

Water suppliers can experience significant benefits from regularly evaluating their system and conducting water management planning.

When appropriate, implementation of Efficient Water Management Practices (EWMPs) can help to improve efficiency.
Efficient Water Management Practices (EWMPs)

The Agricultural Water Management Council, The United States Bureau of Reclamation, and the California Department of Water Resources all require water suppliers to conduct some EWMPs.

Others are voluntary and subject to cost-benefit analysis.
Grower Efficiencies - Techniques and Technologies

Opportunities to help growers improve their irrigation efficiency exist. Ensuring they have access to the tools they need is crucial.

Improving access to tools and techniques such as advanced irrigation scheduling and application device selection and improvement can help growers to improve their efficiency.
Grower Efficiencies-Techniques and Technologies

National Center For Appropriate Technologies (NCAT) Irrigation Methods Assistance

CSU Fresno, In-Field Research Facility CATI

California Department of Water Resources Regional Evapotranspiration data, CIMIS

USDA- NRCS Technical Toolkit
Conservation Potential or Appropriate Irrigation Portfolio?

<table>
<thead>
<tr>
<th>Irrigation Method</th>
<th>Acres Under Method</th>
<th>Average AF/Acre Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity (Furrow/Flood)</td>
<td>4,189,852</td>
<td>3.3 AF/Acre</td>
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<tr>
<td>Sprinkler</td>
<td>1,367,179</td>
<td>2.5 AF/Acre</td>
</tr>
<tr>
<td>Drip/Micro</td>
<td>2,336,140</td>
<td>2.6 AF/Acre</td>
</tr>
<tr>
<td>Subsurface</td>
<td>66,282</td>
<td>.8 AF/Acre</td>
</tr>
</tbody>
</table>
Water Use Efficiency

- 1967 – 2000

  AF applied per acre...2% increase

  Production volume increase...89% increase
Questions?