Impact of irrigated, small-acreage vegetable production on water resources in the Palouse region

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Local Food Production

• Benefits:
  – Decreased fossil fuel emissions
  – Resilient to food chain disruptions
  – Opportunity for dietary diversity
  – Autonomy
  – More nutrients
  – More flavor
  – Supports the local economy
Local Food in the Palouse

- Healthy farmers market
- Moscow Food Co-op
- Palouse Food Coalition
  - Connect local farmers with buyers in the community
  - Hold educational events
  - Hold trainings
Palouse Water Resources

- Decreasing water levels in the aquifer
- Lack of management
Transformation and Objectives

• How much water does it take to grow lettuce in the Palouse?

• How can we integrate water efficient practices with water management?
Methods

<table>
<thead>
<tr>
<th>Rep 1</th>
<th>D1</th>
<th>D2</th>
<th>BS</th>
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<tbody>
<tr>
<td>Rep 2</td>
<td>BS</td>
<td>D2</td>
<td>D1</td>
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<tr>
<td>Rep 3</td>
<td>D2</td>
<td>D1</td>
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Water Balance Equation

\[ P + I = ET + SS + D \]

Some assumptions:
- All irrigation infiltrates
- Water at root zone is available
- Water moves quickly through soil (and lost quickly)
- All rainfall goes towards satisfying calculated ET demand
Typical Irrigation

Water applied: 22.7 in
Water lost to deep drainage = 14.8 in
Yield loss = 22%
Optimum Irrigation

Water applied: 3.5 in
Water lost to deep drainage = 0 in
Yield loss = 0%

Dotted lines indicate forecast values.
Practical Irrigation

Water applied: 7.6 in
Water lost to deep drainage = 4 in
Yield loss = 0%
Conclusion

• Lettuce should not use a substantial amount of water, IF irrigation is managed wisely
• The “water cost” could be offset by conservation elsewhere
• Irrigating shallow rooted crops is challenging
• Growers need to start monitoring the total inches/gallons of water applied
• Growers should not irrigate their fields equally
• Role for extension faculty in providing irrigation education
• Other crops and other on-farm uses of water
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