GROWING HIGH YIELDING RICE THROUGH EFFICIENT IRRIGATION SOLUTIONS

HIGH YIELDS . . . LOW COSTS . . . PRECISION APPLICATION
Utilizing Mechanized Sprinkler Systems to Reduce Water Use in Rice Production
Blake Onken, Ph.D., CPSS, Lindsay Corp., and Michael McCarty, 3M Planting Company

Rice – Why Mechanized Sprinkler Systems

The potential to save:
Water
Energy
Labor
Fertilizer
Other Input Expenses

Research on rice production under mechanized sprinkler systems dates back more than 30 years, but has seen renewed interest because of water scarcity and food security issues.

This research has shown:

REDUCED WATER CONSUMPTION
Without sacrificing yield or quality
• Up to 50% water savings compared to flood
• Reduced pumping costs = energy savings
• Comparable yields to paddy rice

EXPANSION OF RICE PRODUCTION
TO AREAS UNSUITED TO PADDY PRODUCTION
• Mixed and light-textured soils
• Sloped and undulating fields
• Upland areas

PRODUCTION COST SAVINGS
• Better control of chemicals/fertilizers
• No land repair, heavy tillage
• No field leveling required
• No canal construction
• No dike construction and maintenance

POTENTIAL TO REDUCE POLLUTION
AND IMPROVE HEALTH
• Reduce greenhouse gas emissions from flooded fields
  (est. to be 50-100 million MT methane/yr)^1
• Less habitat for mosquitoes

Results

Water Use of Different Grain Crops

<table>
<thead>
<tr>
<th>Measure</th>
<th>Levee rice RRVP field</th>
<th>Pivot Irrigated Rice Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Use</td>
<td>23.2 in (588 mm)</td>
<td>18.2 in. (463 mm)</td>
</tr>
<tr>
<td>Power</td>
<td>$46.37/ac ($114.53/ha)</td>
<td>$29.28/ac ($72.33/ha)</td>
</tr>
<tr>
<td>Yield</td>
<td>199 bu/ac (10.0 MT/ha)</td>
<td>192 bu/ac (9.68 MT/ha)</td>
</tr>
<tr>
<td>Total Expense</td>
<td>$477/ac ($1,179/ha)</td>
<td>$362/ac ($896/ha)</td>
</tr>
<tr>
<td>Net Return</td>
<td>$717/ac ($1,771/ha)</td>
<td>$798/ac ($1,950/ha)</td>
</tr>
</tbody>
</table>

Summary of Benefits to Growers
• Water/energy conservation
• Expansion of rice production without expensive land development
• Utilization of lighter textured soils and undulating fields
• Rotation of rice with other crops to improve soil fertility/condition
• Early season rains less likely to drown germinating rice (direct seeded)
• Fields will dry earlier – harvest can begin sooner

Source: Dr. Gene Stevens, University of Missouri

Additional information and case study available at www.ecorice.net
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Zimmatic
WATERTRONICS
Efficient Pumps Solutions

June 5
Arkansas, USA

August 26
Arkansas, USA

1 Source: Based on Brazilian field trials
4 Source: Zwart and Bastiaansen. 2004. Review of measured crop water productivity values for irrigated wheat, rice, cotton and maize.

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WATERTRONICS
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Essentials for Successful Pivot Rice

**IMPROVED RICE GENETICS**
- Use of blast-resistant varieties is critical
- Carefully monitored herbicide and fungicide programs

**IMPROVED SPRINKLERS**
- Larger droplet size, better uniformity and overlap
- Lower application rates

**NEW TRACKING SOLUTIONS FOR BETTER FLOATATION**
- Three-wheel tower structures
- Z-TRAX for optimum floatation

**FIELDNET™ WEB-BASED IRRIGATION MANAGEMENT**
- Pivot control from computer or cell phone
- Provides precise control of irrigation and chemigation

**CHEMIGATION/FERTIGATION**
- Liquid Nitrogen fertilizer can be applied as needed throughout growing season
- Minimizes fertilizer loss and improves plant utilization
- Reduced application costs

**FLEXIBILITY IN CROP ROTATION**
- Rotation to other crops essential to soil health

For more information on rice and other crop specific irrigation solutions, visit [www.zimmatic.com/keycrops/](http://www.zimmatic.com/keycrops/) or talk with your Lindsay dealer.