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Master Irrigator Program

Irrigation System Requirements

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Top Ten Irrigation Considerations

1. **Water Source and Availability:**
   - Evaluate your water source: well, municipal water, pond, or other source, and assess its capacity and water quality.
   - Water quality: Poor water quality can require treatment or filtration, impacting costs and system performance.
   - Water pressure: Ensure sufficient water pressure to operate the system effectively.

2. **Soil Type:**
   - Soil characteristics: Consider soil type (e.g., sandy, clay, loamy) as it affects water absorption and drainage, influencing irrigation needs.
   - Soil health: Healthy soil with good structure and organic matter content promotes better water infiltration and root growth.

3. **Climate:**
   - Climate conditions: Factor in local climate conditions, including rainfall patterns, temperature, and wind, to determine irrigation needs and system design.
   - Weather modeling: Consider weather modeling to predict weather conditions and make informed decisions about irrigation schedules.

Top Ten Irrigation Considerations (Continued)

4. Plant Needs:

Plant type: Different plants have different water requirements, so consider the types of plants you're irrigating and group them accordingly.

Plant placement: Group plants with similar water needs together to optimize watering efficiency.

5. Irrigation System Type:

System type: Choose the appropriate irrigation system type (e.g., sprinkler, drip, subsurface drip) based on your landscape, plant needs, and budget.

Coverage: Ensure the system provides comprehensive coverage to all areas of your property without wasting water.

6. Cost:

Initial cost: Consider the initial cost of the system, including installation and equipment.

Operating costs: Factor in ongoing costs, such as energy for pumps and water bills.

Top Ten Irrigation Considerations (Continued)

7. Maintenance:

Maintenance requirements: Choose a system that is easy to maintain and consider the frequency of maintenance needed.
Winterization: Ensure the system is properly winterized to prevent damage from freezing temperatures.

8. Water Pressure:

Water pressure: Ensure the system has adequate water pressure to operate efficiently and prevent water waste.
Pressure regulation: Use pressure regulators to maintain consistent water pressure throughout the system.

9. Coverage:

Coverage: Design the system to provide even and comprehensive coverage to all areas of your property.
Zoning: Implement different zones to address varying water needs for different plant types and areas.

10. Water Distribution:

Water distribution: Ensure that the water is distributed evenly and efficiently to avoid overwatering or underwatering.
Sprinkler head placement: Properly space and angle sprinkler heads to ensure uniform coverage.

Irrigation Options

Georgia ag irrigation systems fit into one of two broad categories: sprinkler irrigation and micro-irrigation (drip). Sprinkler irrigation systems include center pivot, and any overhead type watering. Micro-irrigation systems include drip (or trickle) irrigation and micro-sprinklers. No one system is a best fit for every application. Considerations include: • crop • fuel cost and availability • size and shape of the field • labor requirements • water source and availability • initial cost • do you own or rent.

Whatever your Irrigation Preference Proper Design and Efficiency are of Utmost Importance

Irrigation System Trouble Shooting

Define, Identify, Brainstorm, Choose Option, Make a Plan, Take Action, Evaluate

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What is Happening in this Picture?

At first glance – Oh, they planted in a circle.
That's what I thought too!
Nope, look a little closer.

Water Supply was constant from pond.

Farmer bought a used pivot that fit his field perfectly but design was not correct.

Non-working pressure gauge – if working could have caught low pressure issue earlier.

Unaware of problem until a drone flight. First two spans had rotators spaced to far apart.

As designed it was not throwing water far enough and with enough pressure to go through the canopy.

Learned the hard way that he should have known his available flow and nozzle the pivot to match good pressure and outlet supply of water uniform.

Pivot needed slowing down and smaller nozzles.

IN Per 360 degrees	Pivot % Timer	Hours Per 360 degrees
0.363	100.0	12.1
0.40	90.8	13.3
0.50	72.6	16.7
0.60	60.5	20.0
0.70	51.9	23.3
0.80	45.4	26.7
0.90	40.4	30.0
1.00	36.3	33.3
1.25	29.1	41.6
1.50	24.2	50.0
1.75	20.8	58.2
2.00	18.2	66.5
2.50	14.5	83.4
3.00	12.1	100.0
3.50	10.4	116.3
4.00	9.1	133.0
[illegible]	7.3	165.8
[illegible]	6.1	198.4

Pivot % Timer	IN Per 360 degrees	Hours Per 360 degrees
100.0	0.363	12.1
90.0	0.40	13.4
80.0	0.45	15.1
70.0	0.52	17.3
60.0	0.61	20.2
50.0	0.73	24.2
45.0	0.81	26.9
40.0	0.91	30.3
35.0	1.04	34.6
30.0	1.21	40.3
25.0	1.45	48.4
20.0	1.82	60.5
17.5	2.08	69.1
15.0	2.42	80.7
12.5	2.91	96.8
10.0	3.63	121.0
7.5	4.84	161.3
5.0	7.26	[illegible]

Sprinkler Chart

A most important tool used to determine the appropriate nozzle sizes and flow rates for sprinklers on a center pivot irrigation system to ensure uniform water distribution and efficient irrigation.

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Stopped Up Nozzles

- Image having a soil moisture sensor in one of these gaps and wonder why its not showing a reading when you irrigate

Leaks

Sometimes they are quite obvious

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What Do You Think about this picture?
Looks pretty normal to me — or does it?

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Oh, that's just pivot tracks.

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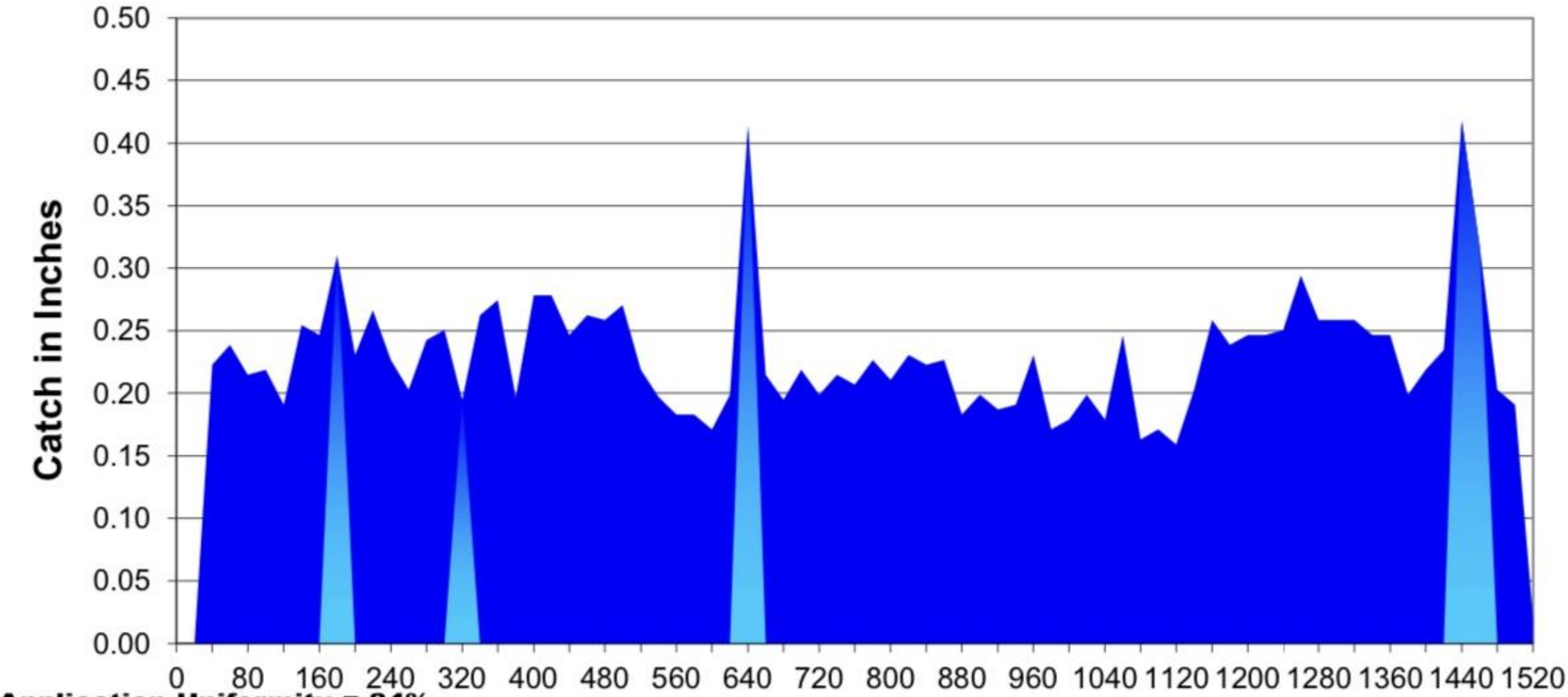
Broken Nozzle

Excess water washing out soil and plants

Common End Gun Setting Issue



Application Uniformity = 84%
Application Efficiency = 87
Effective Irrigation = 0.22 Inches

Application Uniformity Ratings	
80 100%	Excellent
70 - 79%	Good
60 - 69%	Fair
Below 60%	Poor

Importance of End Gun Shutoff

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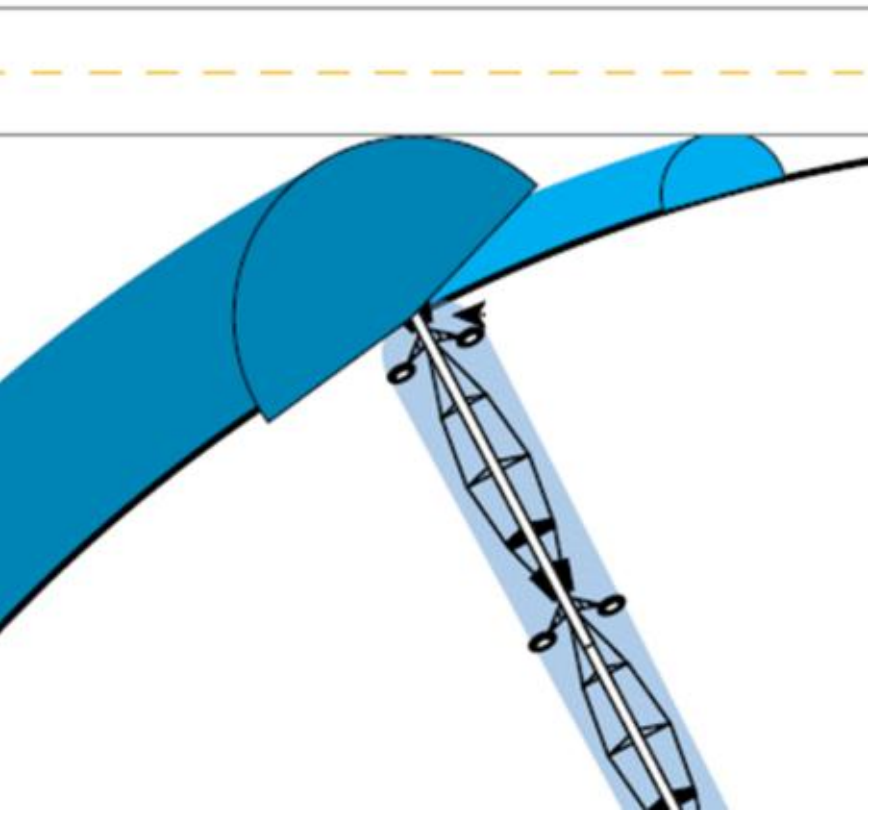
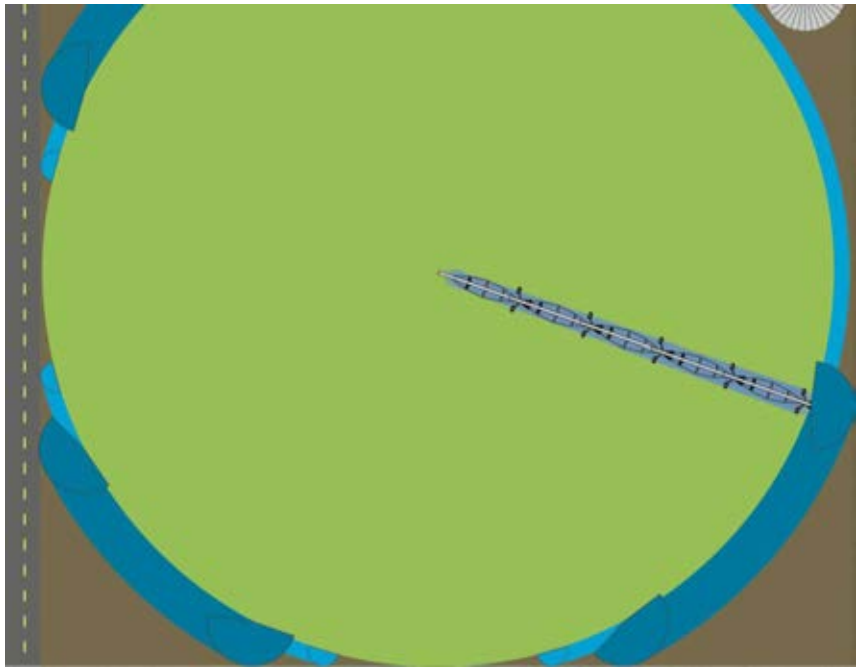
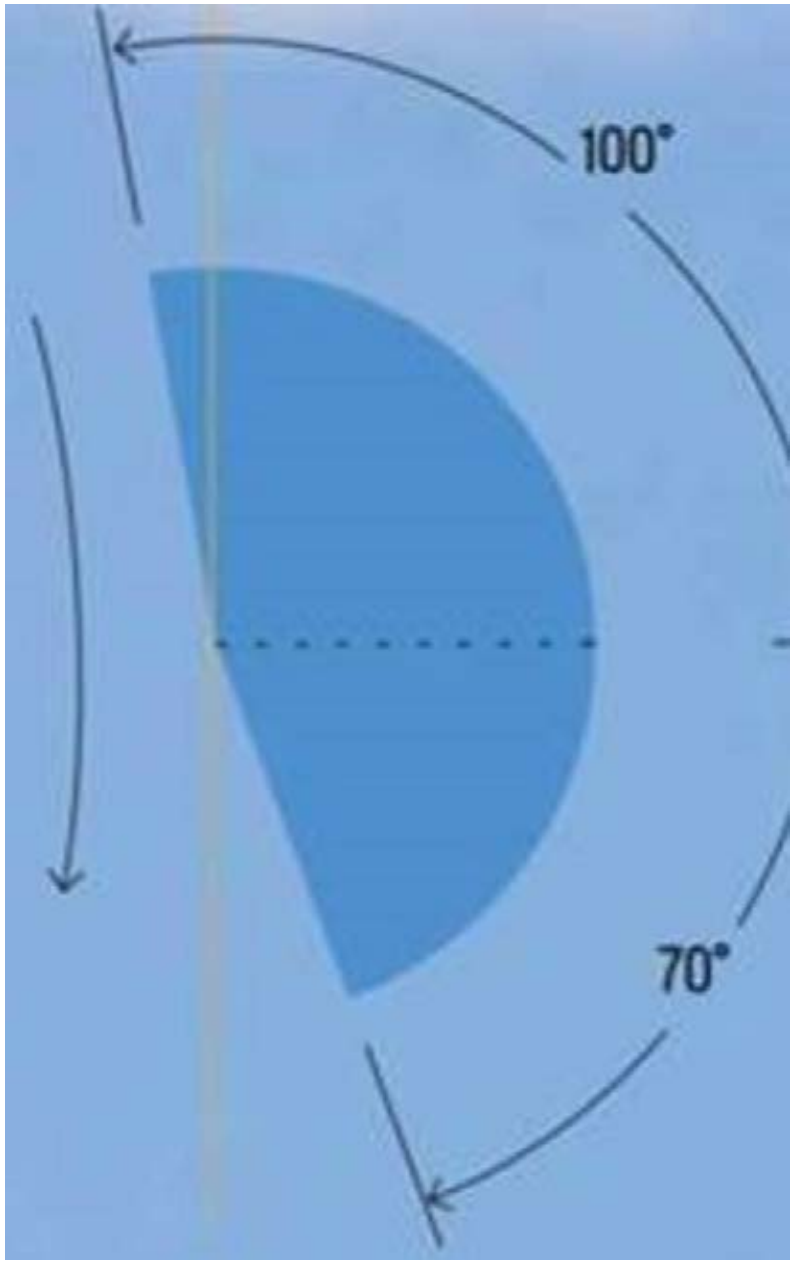






Properly working End Gun Shutoff

= Water use efficiency and safety

Can We Improve On This?

In this picture, Google Earth lets us see the length of the pivot (the long line in the center). The circle is just outside the last pivot track.

With the end gun operating, it appears to leave room for the end gun to reach the entire field, but the end gun might be reaching over the property line on the right – if the end gun cutoff is not working properly.

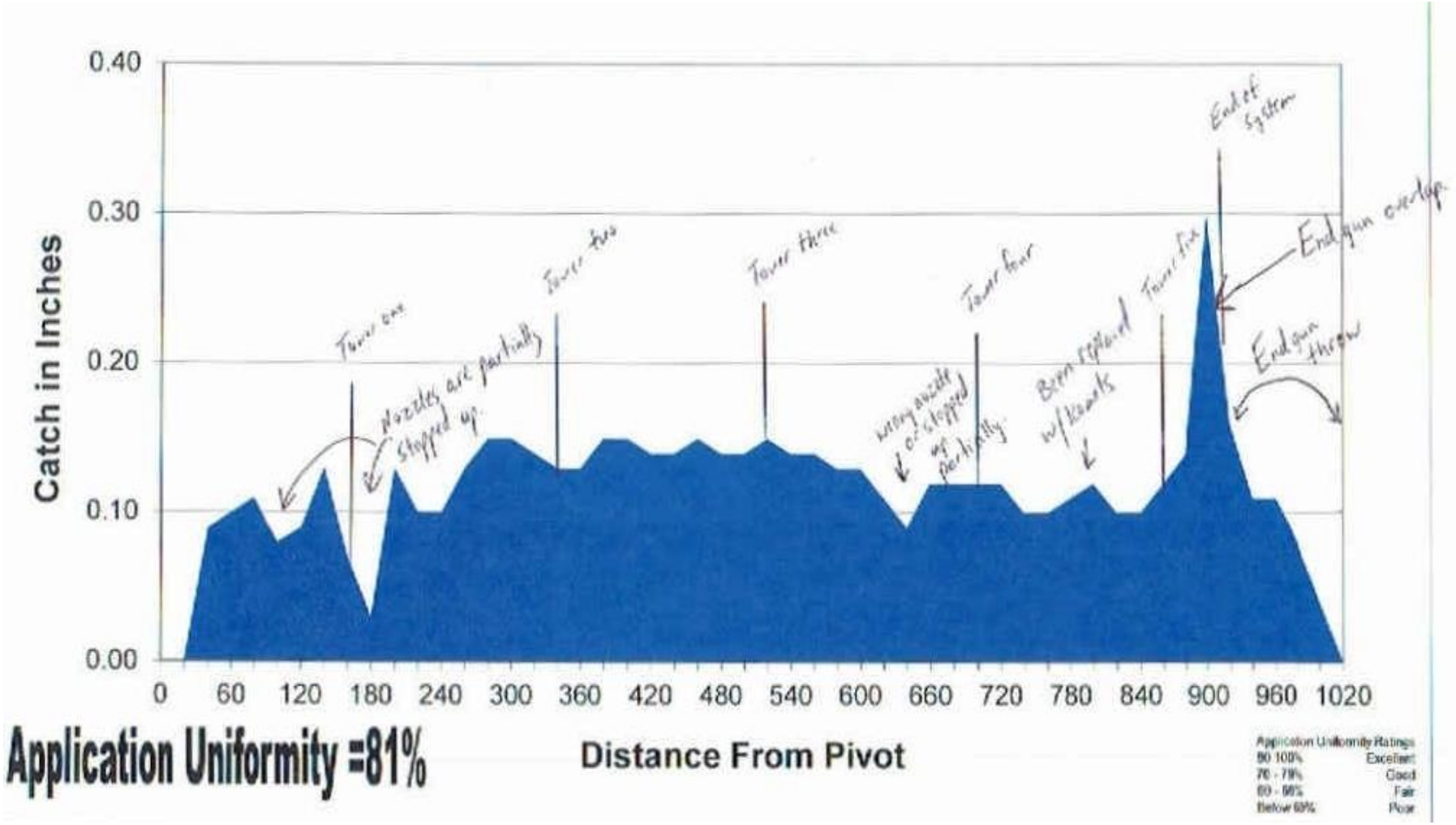
Common Issues with Aging Rotors

Age, Wear and Tear, and Time
Impact the efficiency of your Irrigation System

Mobile Irrigation Labs (MIL's) – Pivot Uniformity Tests Can Reveal Issues That Lead to $$$ left on the table….

Reason for an MIL audit

- Pivot age or farmer has noticed issues
- Point out obvious areas for improvement
- Supply application charts with uniformity percentage
- Graph water applications in detail through system
- Identify flow issues
- Identify end gun issues



Take Home Notes For Irrigation Systems

Irrigation system must be DESIGNED correctly and INSTALLED correctly!

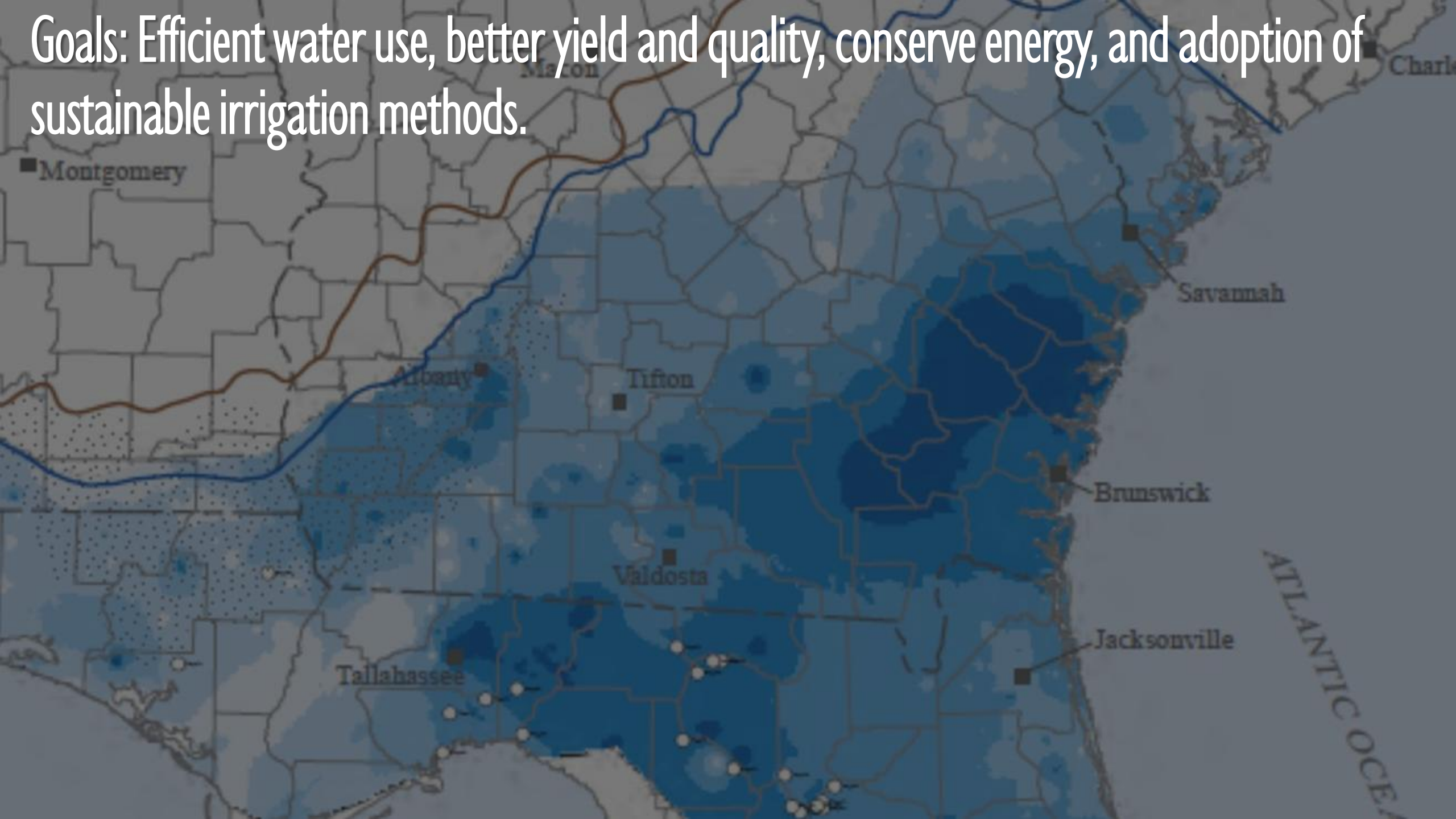
Flow must meet demand

- 6-7 gpm per acre - split crop if needed
- Consider peak demand if needed
- PSI must meet design requirements

Maintenance must be performed annually to ensure uniform distribution of water!

- Most obstructions occur in first span or two
- Ensure end gun is set correctly
- Fix leaks

Goals: Efficient water use, better yield and quality, conserve energy, and adoption of sustainable irrigation methods.



We look forward to you participation in the 2025 Master Irrigator Program!!!

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Thank You!!!

For more information contact your county agent.

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