Growing High-Yielding Rice

UNDER A ZIMMATIC PIVOT IRRIGATION SYSTEM

BENEFITS OF PIVOT IRRIGATED RICE

- Yields comparable to flood
- Lower operating costs and improved ROI
- Requires less water
- Precision application of fertilizer and chemicals
- No dikes or ground leveling
- Plant and harvest sooner because the soil is not saturated by flood irrigation
- Ability to rotate rice with multiple crops
- Ability to grow rice on land previously not suitable for flood-irrigated rice

Saving Water, Labor and Energy

Michael McCarty's family has been growing flood irrigated rice near Osceola, Arkansas, for decades. Recently, McCarty worked with Lindsay Corporation, maker of Zimmatic® irrigation systems, to participate in one of the country's first large-scale commercial rice research projects involving pivot irrigation systems.

The result: rice yields on par with flood irrigated rice, substantial water, labor and energy savings, increased grower profitability and production flexibility.

Michael, along with his father, Mike, and brothers Frank and Phil, owns 3M Planting Company and raises nearly 1,000 acres (405 hectares) of rice in the heart of U.S. rice growing country. The rice is sold to a major beer brewery.

ROI SUMMARY

- $52.29 – per acre ($129.16 per hectare) increase in net profit
- 21 percent – estimated water savings
- 37 percent – energy savings

LINDSAY™

CHALLENGE

Michael McCarty worked closely with a team of Lindsay irrigation experts and his crop consultant in putting 70 acres (28 hectares) of hybrid rice under a Zimmatic by Lindsay pivot during the 2009 growing season. The other half of the pivot circle was devoted to soybeans.

Unlike flood irrigated rice, the field did not need to be leveled and there was no need to build levees or install flood gates. Growing rice under pivot irrigation also allows McCarty to rotate with multiple crops, including soybeans.

McCarty was especially interested in seeing how pivot irrigated rice could address common rice production challenges such as weed and disease control, nitrogen management and getting enough water on the rice when needed. He also set out to document potential water, energy and labor savings.

McCarty looks to pivot irrigation as a way to increase his rice acres.

"My goal is to grow more acres of rice and improve the overall profitability of my farming operation. Because flood irrigated rice can only be grown on certain types of ground in my area, pivot irrigation is a great way to increase my rice acres and total rice production," McCarty says.

In addition, because flood irrigated rice fields may still be wet come planting time in spring, many growers chose to plant soybeans instead of another crop of rice. With pivot irrigation, McCarty says he can continue to plant rice in the same fields as the year before.

Lindsay's Trax tracking system provides improved floatation and reduced rutting on McCarty's pivot irrigated rice.

SOLUTION

The Zimmatic pivot on McCarty's northeast Arkansas farm is 1,286 feet (392 meters) long and includes seven towers. The seven-year-old pivot was equipped with Lindsay's latest tools and technology for pivot irrigated rice, including:

- FieldNET™, Lindsay's award-winning Web-based irrigation monitoring and control system
- Trax, Lindsay's exclusive track system that provides superior traction and flotation
- Global Positioning System (GPS) controller for accurate positioning
- 3-wheel drive tubes for improved flotation and reduced rutting
- Growsmart™ by Lindsay injection system for chemical and fertilizer application
- Flood nozzles

"The FieldNET Web monitoring and control was instrumental in making the whole pivot irrigated rice project work. It was huge because rice needs to be watered every other day," McCarty says. " I ran the pivot across the field 29 times. I only went to the control box on the pivot two times the entire summer."

"It's also critical that you don't apply water to rice when it is pollinating – during the flowering stage. With FieldNET, I was able to cut off the pivot during the day between 11 a.m. and 3 p.m. so the crop wouldn't be disturbed. This also minimized evaporation."

Osceola, Arkansas, rice grower Michael McCarty is partnering with Lindsay Corporation, maker of Zimmatic irrigation systems, on one of the country's first large-scale commercial rice research projects involving pivot irrigation systems. The pivot irrigated rice yielded competitively with flood irrigated rice and cost less per acre to produce.

With flood irrigated rice, McCarty was required to physically go to his well pump to turn the irrigation water on and off and to check the water flow.

"I probably had to do this 40 to 45 times with my flood irrigated rice," McCarty says. "The FieldNET Web monitoring and control was a huge labor savings."

In addition to applying 200 pounds (91 kilograms) of urea nitrogen pre-planting, McCarty used Growsmart chemical injection system to apply 200 additional pounds of nitrogen over five applications to reach his goal of applying a 28 percent nitrogen solution.

"You definitely need the chemigation pump to 'spoon feed' the nitrogen to the crop over the course of the growing season. It worked well because we applied only enough nitrogen as needed by the crop." This also minimized fertilizer and chemical leaching and runoff.

Disease can be a huge problem in rice, but not in McCarty's pivot irrigated rice.

"I didn't have to treat for diseases at all, which surprised a lot of people since we had weather conditions conducive to disease," he says.

"I was able to reduce labor costs and I saved on water and energy costs as well."

– Michael McCarty

Plus, McCarty said weed control was not a problem as all of his herbicide applications were applied via his ground sprayer rig.

RESULTS

McCarty's pivot irrigated rice yielded 192 bushels dry per acre (9.68 MT/ha). A nearby flood irrigated rice field averaged 200 bushels dry per acre (10.09 MT/ha).

"I was amazed at the yield from my pivot irrigated rice."

McCarty says growing rice with pivot irrigation was "very simple" and not nearly as labor intensive as his flood irrigated rice.

"With flood irrigated rice, you normally need someone devoted to it full-time because of all the levees, gates and water levels that need to be checked and adjusted. Growing rice with pivots was much easier."

McCarty estimates his pivot irrigated rice resulted in a 21 percent reduction in water usage.

Next year, McCarty plans to grow rice on the backside of his pivot, which includes heavier soil that is even more conducive to rice and holding water.

"Overall, I was extremely pleased with my pivot irrigated rice. The yields were on par with my flood irrigated rice, I was able to reduce labor and other input costs, and I saved on water and energy costs as well," McCarty says.

"If this works two years in a row, I will retrofit my existing pivots to raise rice on new ground and be able to basically increase my rice acres by 50 percent. That's my goal, to increase my rice acres, and so far, it's looking like I'll be able to reach that goal. Pivot irrigated rice has given me new options in growing rice on ground that has never seen rice before."

PIVOT vs FLOOD COMPARISON

Lindsay Commercial Rice Research Project

(Osceola, Arkansas)

PIVOT IRRIGATED RICE	FLOOD IRRIGATED RICE
YIELD: 192 bushels (9.68 MT/ha) dry per acre	**YIELD:** 200 bushels (10.09 MT/ha) dry per acre
WATER USAGE: 18.25 inches (463.38 mm) **(21 percent reduction)**	**WATER USAGE:** 23.18 inches (588.54 mm)
POWER COST: $29.28 per acre ($72.33/ha)	**POWER COST:** $46.37 per acre ($114.53/ha)
EXPENSES: $365.24 per acre ($902.15/ha)	**EXPENSES:** $465.53 per acre ($1,149.85/ha)
NET RETURN: $786.76 per acre ($1,943.29/ha)	**NET RETURN:** $734.47 per acre ($1,814.14/ha)

FAST FACTS – 3M PLANTING COMPANY

- Comprised of Mike McCarty and his sons, Michael, Phil and Frank
- Michael McCarty and his wife, Nikki, are the parents of two children, Caden, age 7, and Trenten, age 6
- Raise approximately 1,000 acres (405 hectares) of rice in northeast Arkansas
- Also raise soybeans, corn, cotton and wheat

Michael McCarty is pictured here, second from left, with Lindsay's Randy Wood, Rick Provaznik and Andy Murdock. McCarty says FieldNET's Web-based monitoring and control was key to successfully growing high-yielding rice under pivot irrigation.

www.zimmatic.com/rice

Additional information about the McCarty Farm commercial rice research project can be found on the web at www.zimmatic.com/rice. You'll also find information on water, labor and energy savings through pivot irrigated rice, the latest news and research about pivot irrigated rice, and a video about pivot irrigation on rice.

Visit our YouTube page at www.youtube.com/lindsayirrigation for short, informative videos on the latest Lindsay irrigation products and control technology.

For more information about Zimmatic® and Lindsay irrigation solutions, visit www.zimmatic.com or talk to your local Zimmatic by Lindsay dealer.

SOURCE: 3M Planting Company and Lindsay.

For more information, call 1-402-829-6800, toll-free 1-800-829-5300 or visit www.zimmatic.com/rice

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