

Growing High-Yielding Rice in Australia

UNDER A ZIMMATIC PIVOT IRRIGATION SYSTEM



Saving Water with Pivot Irrigated Rice

Brian Protheroe is a fourth-generation Australian farmer who has been growing flood irrigated rice since 1995. Because of water shortages caused by recent dry years in Australia and the bullish price of rice, Protheroe decided to grow rice with efficient Zimmatic center pivot irrigation.

One of his main goals with pivot irrigated rice was to save water, which Protheroe has realized. He conservatively estimates saving 40 percent of the water he normally uses with flood irrigated rice.

In addition to rice, Protheroe raises wheat, barley, canola, corn and grain sorghum on his farm near Narrandera, NSW, Australia.

BENEFITS OF PIVOT IRRIGATED RICE VS FLOOD IRRIGATED RICE

- Lower operating costs
- Requires less water
- Precision application of fertilizer and chemicals
- No dikes or ground leveling
- Able to use larger equipment in rice fields
- Plant and harvest sooner
- Option to rotate rice with multiple crops
- Ability to grow rice on land previously not suitable for flood irrigated rice

SUMMARY

- Estimated 40% water savings
- Average yield of 7.6MT/ha (151 bu/ac)
- Short-season rice variety yielded 9.84 mt/ha (195 bu/ac)
- Excellent weed management and control

CHALLENGE

Brian Protheroe had lots of experience raising traditional flood irrigated rice but little knowledge of growing rice under pivot irrigation. He did his research on pivot irrigated rice, including a trip to the United States and the Michael McCarty rice farm near Osceola, Arkansas.

McCarty's successful experiences raising rice under pivot irrigation were documented in a previous Lindsay case study, showing substantial water, labor and energy savings and yields on par with flood irrigated rice.

Using the knowledge he gained from the Arkansas rice farm and by working closely with Lindsay's integrated team of rice irrigation experts, Protheroe planted his first rice crop under pivot irrigation in October of 2009.

He planted two varieties of rice: Quest, a short-season, short-grain variety, and Amaroo, a long-season, short-grain variety, on 30 hectares (74 acres) of land known locally as the Glen Ayre Farm.

"I wanted to grow two different varieties so I had two different maturities and tried to establish which variety was more suited to pivot irrigation."

Protheroe says several years of drought taught growers in his area of southeast Australia that water was in short supply. Groundwater is the main source for his four Zimmatic center pivot irrigation systems, but Protheroe plans to add more pivots and pump stations to access water from a nearby river.



Lindsay's Z-TRAX tracking system provides improved flotation and reduced rutting on Protheroe's pivot irrigated rice.

"The growing season started off with below average rainfall; it was very dry," Protheroe says. "After Christmas we started seeing reasonable rains, maybe a little above average on the moisture, which is always welcome after a dry spell."

Protheroe used a large 60-foot (18.3 meter) planter to plant the rice, something he had previously

not been able to do because of the dikes and berms that are used in flood irrigated rice fields.

Based on his tour of the McCarty Farm in Arkansas, Protheroe was particularly interested in learning about controlling weeds in his pivot irrigated rice and about any tracking issues with his pivot.

He also wanted to keep detailed records on potential water, energy and labor savings and the overall profitability of growing pivot irrigated rice. Electronic weather monitoring stations were installed in the field, and Protheroe used yield monitors and field mapping technology to help document return on investment.

SOLUTION

The Zimmatic rice pivot on Protheroe's farm is 302 meters (991 feet) long and includes six towers. The new pivot was equipped with a Nelson S3000 Yellow Plated Spinner sprinkler package, which applied fine droplets of water "like a good steady rain," Protheroe said.

The rice pivot was outfitted with Lindsay's Z-TRAX tracking system and three-wheel drive tubes for improved traction and flotation. "The Lindsay tracking systems helped enormously," he said.



Australian rice grower Brian Protheroe partnered with Lindsay Corporation, maker of Zimmatic irrigation systems, and his local Zimmatic dealer, Flow Smart, when planting his first rice crop under pivot irrigation. Protheroe's short-season variety yields were outstanding, and he estimates using 40% less water compared to flood irrigated rice.

Because pivot irrigated rice can be planted on sloped fields of up to 30 degrees and doesn't require costly field-leveling, dikes and canals, Protheroe was able to plant his rice on ground that had been in wheat the year before.

"Not having to do dikes was key and really convenient, especially for my operation. We have large equipment, and I was able to go right into the field with our large seeder. With dikes and berms, I couldn't do that," Protheroe says.

Fertilizer was applied through the Zimmatic pivot, a tractor spreader and an airplane.

Protheroe used the Zimmatic pivot's chemigation system to apply a small amount of insecticide to control army worms in late January.

Protheroe was extremely pleased with weed control in the pivot irrigated rice.

"Weed management was very simple. I applied all of the weed control products with a ground spray rig and then lightly watered it in with the pivot. It worked great."

"One of the many benefits of rice production under a pivot is the ability to apply herbicides

Brian Protheroe conservatively estimates using 40 percent less water growing pivot irrigated rice compared to flood irrigated rice.

using existing equipment such as sprayers," says Bryce Yates, managing director at Flow Smart, Protheroe's local Zimmatic dealer. "With flood irrigation, this has to be done by airplane, which is much more expensive."

Protheroe says neighbors and agronomists were keeping a close eye on his pivot irrigated rice.

"They kept asking, 'How clean is it?' They expected to see a lot of weeds but there were hardly any weeds; it was a very clean field."

Protheroe attributes part of that to the fact that the field, made up of heavy clay soil, had previously been planted to dryland wheat, as well as the advantage of being able to rotate other crops with pivot irrigated rice.

RESULTS

Protheroe's short-season rice variety yielded 9.84 metric tons dry per hectare (195 bu/ac), with some sections yielding up to 15 metric tons dry per hectare (297 bu/ac). The long-season rice variety yielded 5.31 metric tons dry per hectare (105 bu/ac).

"I planted the short-season rice variety because the nights can get cool in our area around the end of December through mid-January, which can damage yield when the rice is heading. As it turned out, yields on the short-season variety were outstanding. I was very pleased with the yield on the short-season rice."

Protheroe conservatively estimates using 40 percent less water growing pivot irrigated rice compared to flood irrigated rice.

Protheroe plans to continue to grow pivot irrigated rice, depending on how dry it is in his area and the market price of rice. He would like to follow-up with another crop of pivot irrigated rice in the same field but is also considering oats or wheat. With rice under Zimmatic pivot irrigation, he now has the freedom and flexibility to do that.



**FAST FACTS – BRIAN PROTHEROE,
C.H. PROTHEROE PTY LTD**

- Fourth-generation Australian farmer
- Farms with his father, Colin Protheroe
- In addition to rice, raises approximately 5,600 hectares (nearly 14,000 acres) of wheat, canola, corn and grain sorghum
- Local Zimmatic dealer:
Flow Smart Pty Ltd,
Griffith, NSW, Australia
- Rice marketed through SunRice growers cooperative



The Zimmatic rice pivot on Brian Protheroe's farm in Australia includes three-wheel drive tubes for improved traction and flotation and to eliminate pivot bogging.



www.ecorice.net

Lindsay Zimmatic® has become a leader in showing growers how to profitably raise rice under pivot irrigation. Additional information about the Protheroe Farm and McCarty Farm commercial rice research projects can be found at **www.ecorice.net**. 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 photos of the Protheroe and McCarty rice farms.

Additional data on Brian Protheroe's pivot irrigated rice is now being processed. Be sure to check www.ecorice.net for updates on this data.

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

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