

Greener Future for Australian Sugar Cane Farmer

Maximum Yield with a Zimmatic Lateral Irrigation System

SUMMARY

Hesp Farms is located in one of Australia's largest and most productive sugar cane growing areas. Since 1991, farm owner Chris Hesp and his wife, Sonya, have grown 607 hectares (1,500 acres) of flood irrigated sugar cane in the Burdekin region of North Queensland. In order to save water and improve soil health, Hesp now irrigates his crop with a Zimmatic® by Lindsay lateral irrigation system.

With the help of their three children, the Hesp's tend to and sell the sugar cane themselves. The sugar cane is harvested and cut into 10-15 centimeter (3.9-5.9 in.) billets before being taken to a mill where it is crushed and processed into raw sugar.

The main goals the Hesp's were looking to achieve with their new lateral irrigation system were saving water, and following the trend of green cane harvesting and trash blanketing.

"There's a definite increase within the area's sugar cane industry to improve water management and move towards removing the pre- and post-harvest burning method," says Hesp. "We are excited to be a greener farm."

Green cane harvesting and trash blanketing are being trialed in the Burdekin region to help minimize any pesticide concerns which may threaten the Great Barrier Reef, the rising ground water levels, and the high use of water.



The Burdekin region of North Queensland is one of Australia's largest and most productive sugar cane growing areas.

CHALLENGE

The Burdekin region is classified as the dry tropics with an average annual rainfall of only 1,000 millimeters (39 in.) – 75 percent of its rain falls in the summer months. There is a well-known dry season

from June through October in this region. The annual evaporation is approximately 2,000 millimeters (79 in.); therefore crops must be grown under complete irrigation to maximize yields.

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– Chris Hesp, Hesp Farms





Along with other members of the Mulgrave Area Farm Integrated Action (MAFIA) group, the Hesp's conducted a four year sugar cane crop cycle trial comparing a lateral/pivot system (used on their own farmland) to both furrow and drip irrigation systems on a nearby property.

Hesp Farms had been losing an average of 513 to 627 millimeters (20 to 25 in.) of water per yielding season with flood irrigation; this represents between 19 to 23 percent of the total water applied. And water costs were almost twice as much.

As chairman of the MAFIA (Mulgrave Area Farm Integrated Action) group, Chris Hesp took on the innovative idea of finding alternative irrigation that would produce maximum yields, while staying environmentally friendly. "I needed to provide myself with

further knowledge of using a lateral system to see how I could maximize our farm's sugar cane yield, while using the system to help reduce waste," Hesp says.

Along with other MAFIA members, Hesp conducted a four year crop cycle trial comparing a lateral/pivot system (used on his own farmland) to both furrow and drip irrigation systems on a nearby property.

Accurate soil moisture monitoring took place, along with tracking water runoff and nitrogen levels in water runoff.

FAST FACTS HESP FARMS RESEARCH SUMMARY

- Research alternative irrigation systems and compare with conventional furrow irrigation
- Results indicated it was possible to grow sugar cane under an overhead low pressure irrigation system (in this case, a Zimmatic ditch-fed lateral) and the sugar cane could be harvested green
- Opportunity for improved water use efficiency
- Reduced loss of nutrients via deep drainage and irrigation runoff
- Decreased herbicide use because of trash blanketing
- Trial demonstrated that agronomically alternative systems, including overhead low pressure irrigation, can deliver water in an effective manner to grow high-yielding commercial crops of sugar cane

"We are excited to be a greener farm."

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Zimmatic by Lindsay ditch-fed lateral irrigation system on the Hesp farm.

SOLUTION

The Zimmatic ditch-fed lateral irrigation system Hesp now uses is 600 meters (1,968 feet) long and equipped with a Nelson S3000 sprinkler package (260 sprinklers) that Hesp says “resembles a steady rain.”

Hesp planted his first sugar cane crop under the Zimmatic lateral in March 2006. He has since increased his lateral irrigation use from 44 hectares (108 acres) to 132 hectares (326 acres) of his farmland in the last two years.

With a lateral irrigation system, growers experience less water waste. As Hesp deals with the drier weather in Australia, controlling the timing and amount of water that is applied is crucial to maximum yield. This system also helps prevent any contamination to the water table and nearby natural water sources.

Another reason Hesp decided to adopt lateral irrigation was to continue the use of green cane trash blanketing.

“With the new lateral irrigation, we do not have to burn anything,” he says. “We just leave the trash on the ground, which helps enrich the soil and keeps the evaporation down, acting like a mulch. Plus, we don’t have the smoke, no burn fumes.”

The nitrogen runoff in burnt cane sites is more significant than those of green cane sites, resulting in higher natural water source contamination. The Hesp run a recycled water system which allows for minimal water to leave the farm.



Ditch-Fed Laterals

- Can use existing ditch at field edge or one in the center
- Ditches can be unlined or lined with concrete or plastic and can accommodate grades up to one percent
- Depending on ditch type, water is supplied through a floating intake or a floating self-cleaning filter screen
- For a concrete ditch, a traveling weir assembly is available
- Only available as a four-wheel

Pivots/laterals vs. flood irrigation

Less waste

The most obvious benefit to irrigating with a pivot or lateral system is that it produces less waste. You get even, precise water application across the field (Figure A), rather than having too much water at the upper end, and not enough water at the lower end of the field (Figure B). You can also control the timing and amount of water that is applied while eliminating runoff, helping to prevent contamination of the water table and nearby streams.



Figure A
Pivot/lateral irrigation

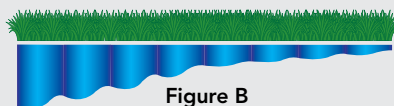


Figure B
Flood irrigation

Lower labor costs

The Zimmatic irrigation system is automated, so no one has to move pipes, or open and close floodgates. One person can operate as many as 25 pivots, and with remote control and monitoring options, they can easily do it during the normal work day.

Higher return on investment

The long life of a pivot or lateral system will save you money year after year. You’ll use less water, reducing your energy costs. A Zimmatic pivot or lateral system also applies chemicals and fertilizers evenly, accurately and inexpensively. All this adds up to consistently higher yields.

RESULTS

With the help of his Zimmatic lateral irrigation system, Hesp's sugar cane yielded an average of 154 tons per hectare (69 tons per acre).

Hesp, along with other members of MAFIA, has acquired new skills and a greater understanding of his lateral system.

"The lateral irrigation system is a new form of irrigation in our area," he says. "It is much more economical with water usage."

The overall cost of the lateral irrigation system is cheapest overall, compared to other methods. The amount of water used has declined resulting in smarter farming, both economically and environmentally. As expected, the runoff from the furrow site was significantly higher

than the lateral irrigation system sites, averaging over the three years at 509 millimeters (20 in.) per year.

Hesp has achieved his goal of saving water, as well as following the trend of green cane harvesting and trash blanketing. And as a result of trash blanketing, he found that these particular crops did not need the use of herbicides.

MAFIA project meetings, conferences and workshops were held during the trial in order to share results with the farming community in the Burdekin area. Since the trial has commenced, there have been several pivot/lateral irrigation systems commissioned in the Burdekin area.



Sonya and Chris Hesp.

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

SOURCE: Chris and Sonya Hesp and Final Report: "Evaluating Alternative Irrigation for A Greener Future" (A collaborative project conducted by The MAFIA grower group, CSIRO Ecosystem Sciences, BBIFMAC, DEEDI.)

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