

Rice Irrigation

*Center Pivot Irrigation
On Rice Can Curb
Diesel Fuel Use*

**Dr. Gene Stevens,
Crop Production Specialist,
at the University
of Missouri Delta Center
says trials on center pivot
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Photo by John LaRose



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Trials on center pivot irrigation in rice are showing promise, according to Dr. Gene Stevens, crop production specialist, University of Missouri Delta Center.

"We're interested in center pivot irrigation on rice because there's some fields that you can't flood," he said. "They don't have the right soil type, either sandboils from earthquakes or there's no clay subsoil to retain water. If we can use center pivot, we can expand our rice acreage to different fields."

Rice can be grown in sandy soil, the difficulty is maintaining water on it. With pivot, the water can be put down whenever it is needed. The floods don't have to be maintained.

"However, the price of diesel fuel is another concern with conventional rice," Stevens said. "We have abundant water here in the Bootheel in Southeast Missouri because of the high water table, but still the price of energy is hurting everybody."

While conserving water isn't the biggest issue here, conserving diesel fuel is.

Stevens is running this experiment on two fields, both about eight acres and one is on sharky clay.

"We've got two nitrogen experiments and two herbicide experiments," he said.

Preliminary results show a saving of about 30 percent on water use by using center pivot compared to side inlet flood irrigation.

"You know there's different ways to flood rice and side inlet is the most efficient way, compared to cascading, and we're reducing that amount by another 30 percent by using the pivot," Stevens said. "Also, we're comparing fertigation where we put the fertilizer in the pivot compared to a dry application, and we're seeing that the fertigation on the center pivot is better than the dry applications like you normally would apply."

Yield response with the two systems was about the same.

"Our highest yielding rice plots with the pivot system produced 175 bushels per acre, which was about the same as we made with flood irrigated plots receiving the same amount of nitrogen," Stevens said. The trial is testing three different varieties, all of which were rated highly resistant to blast.

"We haven't had blast but we have had brown spot and one of the Cybonnets seems to be very susceptible to that," he said. "We could have sprayed it with a fungicide when we first saw it, but we decided not to do that. Since the other two were doing really well, we wanted to see how much effect that had on the rice."

Stevens said he feels the center pivot irrigation is saving energy and fuel, however there are some positives and negatives.

"The positive is with urea fertilizer where there's concern about volatilization," he said. "With the pivot you can apply it dry and just water it in. A half inch of water will prevent volatilization; or since you have the pivot you might as well use the liquid and fertigate it in, so there are more options there. Also, herbicides like Prowl and Command are highly durable as far as activation based on rainfall by using the pivot. There is a series of positives and negatives and you might as well use the positives to your advantage."

The chemistry is the same, but it's more reliable if you can incorporate it with water.

The pivot used at the Delta Center is Valmont, and it was donated by MidValley. They put in a special wheel system that creates less ruts and it shouldn't get stuck. If that doesn't work, one can go with a track type system; however, that adds to the cost of the pivot. Stevens reports no trouble at all with the system now in use.

With the fertigation farmers can eliminate the use of air applications.

"With the tank and a pump you can run that through the system anytime you want to apply it," he said. "That will totally eliminate the air-plane cost altogether."

There is the initial investment for center pivot, but that system can also be used for beans, corn and everything else.

Stevens said the biggest concern with using the pivot was pigweed and palmer amaranth control.

"We have two experiments and it looks like a train wreck because we have a lot of treatments that didn't work but we've got some that worked really well," he said. "Maybe we can learn things before farmers have to make those mistakes."

The trial uses three different lines, one is a hybrid the other two are varieties. One of them is RiceTec 730, the others are Clearfield 171 and Cybonnet.

"All three of those are ranked real high as far as resistance to blast which is a problem that they found earlier in Texas when they did center pivot irrigated rice," Stevens said. "All of them are also ranked very high for brown spot resistance and we're finding Cybonnet is really bad in some of our plots; those other two varieties – the RiceTec and Clearfield – none at all in that, so there are some variety differences we need to be aware of as far as selection on that."

Further trial results can be seen on the internet at <www.plantsci.missouri.edu/deltacrops>.

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