

LESA RETROFITS ARE A HIT WITH SOUTH IDAHO FARMERS



Assembling LESA can be precarious.

By Steve Stuebner

Meet Lesa, she's the new girl in town, and so far, almost everyone seems to like her. Well, except Lesa isn't human. She's a new form of sprinkler retrofit that saves energy and water.

LESA, which stands for low-elevation sprinkler application, was developed by researchers with the University of Idaho and Washington State University. Farmers, who worked with the researchers to try the new technique of lowering sprinkler nozzles to the point where they spray directly into the crop canopy, avoiding wind and evaporation losses, like the results.

"We put in one pivot that worked well for us, and we've done a second one since then," says Mark Telford, an Arco farmer. "It worked pretty good. We had about a 10 percent decrease in water use. It's definitely more efficient. It's always good to save water."

The timing of the onset of LESA technology coming to the fore couldn't be better. The recently inked historic water settlement between the surface water coalition and ground water pumpers in the Eastern Snake Plain Aquifer region calls on junior pumpers to reduce water use by

240,000 acre-feet per year, or by an average of 12-15 percent per farmer, depending on water rights.

"The timing is great!" says Howard Neibling, state irrigation specialist with the University of Idaho at the Kimberly Research and Extension Center, who helped develop the sprinkler retrofits. "It's a technology that has a lot of promise. It's really expanding rapidly."

Mud Lake farmer Steve Shively worked with Neibling to test the LESA retrofits on four pivots out of 18 on his farm in 2016. He plans to convert another six pivots next summer. Shively worked with Rocky Mountain Power, which had a cost-share incentive program to encourage farmers to use less power, to test the LESA technology.

Shively's experience so far shows water savings, power savings and increases in yields. On a winter wheat field, he saw a reduction in water use from 18 gross inches to 10-11 gross inches. He also saw an increase in yield from 150 bushels per acre to 165 bushels per acre. Power savings have been running 20 to 40 percent.

Shively said he's obligated to reduce his water consumption by 7 percent

under the water settlement, but he expects to beat that reduction given his experience with LESA so far, in which he's seen water savings of more like 35 percent.

With the water hoses dangling inside the crop canopy, he doesn't see losses due to wind or evaporation. "We have some days in the spring, where you could have 4-5 days in a row of 15-20 mile-per-hour winds," he says. "With all of the nozzles inside the crop canopy, you don't have any of that wind loss."

The LESA retrofits increase water efficiency, he adds. His pivots went from 80-85 percent efficiency under the normal system, to 95 percent-plus with the LESA system. In addition, the soil remained moist more than five feet deep with LESA, compared to more like 18 inches with the standard system. The long hoses with spray nozzles have a one-pound weight on them to keep them trained toward the crop on the ground.

The LESA system saves the most when the crop canopy has grown up around the nozzles, farmers say. The nozzles hang about 12 to 18 inches above the ground, compared to conventional systems that spray water several feet above the crop.

Using more efficient sprinklers that spray closer to the crop canopy has been used in Texas and Kansas for a number of years, Neibling says. In developing research trials, they tried to use off-the-shelf technology to make it easy and relatively inexpensive for farmers to convert to the LESA system. The cost is about \$25-\$30 per pivot nozzle or about \$10,000 to \$13,000 per pivot, depending on drop spacing, to convert to LESA. Using a pivot dealer to do the labor and installation typically adds about \$3,500 to \$4,000, Neibling said.

Shively prefers to do the retrofits himself, so he has confidence that they've been done correctly. "We



LESA applies water within the canopy

feel safer about doing it ourselves,” he says. “The hardest part is disassembling the old irrigation fittings and putting the new stuff on the pivots. Using a scissors lift and three or four guys, we can convert one pivot in about six hours.”

Lynn Tominaga, executive director of the Idaho Ground Water Association, said he’s glad to see the LESA technology being embraced by ground water pumpers. But he notes that the Natural Resources Conservation Service has provided cost-share funds for LESA conversions only in the Upper Snake River region (Division 6), so far, meaning the cost-share funds are not available for many in the ESPA region.

There may be power incentives provided by various rural co-ops, depending on location.

“It’s not the silver bullet necessarily,” Tominaga says. “A lot of the progressive farmers have already figured out how to meet their reductions (in water use). But LESA is definitely one of the tools for the ground water guys to meet their allocation. The issue is they will need to spend money for the retrofits, and many of them will have to replace their regulators to pump at a lower pressure. It’s not an inexpensive fix.”

The NRCS offices in the Upper Snake are taking applications for cost-share

assistance with installing LESA retrofits. “We’re taking applications for it right now,” says Steve Keller, acting district conservationist for NRCS in Bonneville County. “At this point, we’re trying to limit it to one retrofit per producer.”

In 2016, NRCS signed 27 contracts with producers in the upper valley, Keller said. “If farmers are interested in LESA technology, they should get in touch with their local field office,” he said.

Farmers who participate in the NRCS grant program also are required to use soil-moisture sensors in the fields to avoid over-watering crops.

Shively and others believe that the water and power savings justify making the investment, even without cost-share funds. “I think you could pay it off in two years or less just with the power and water savings,” he said.

However, Idaho Power Company also offers incentives for producers when they retrofit their irrigation systems to make them more efficient. Their incentive program can cover up to 50 percent of the cost of the retrofit, irrigation dealers say.

LESA retrofits have been tried with

success on corn fields, alfalfa, grain and potatoes. Some farmers worried about how the spray heads might affect the crops as the pivots rotate through the crop field, but so far, they have not seen any damage.

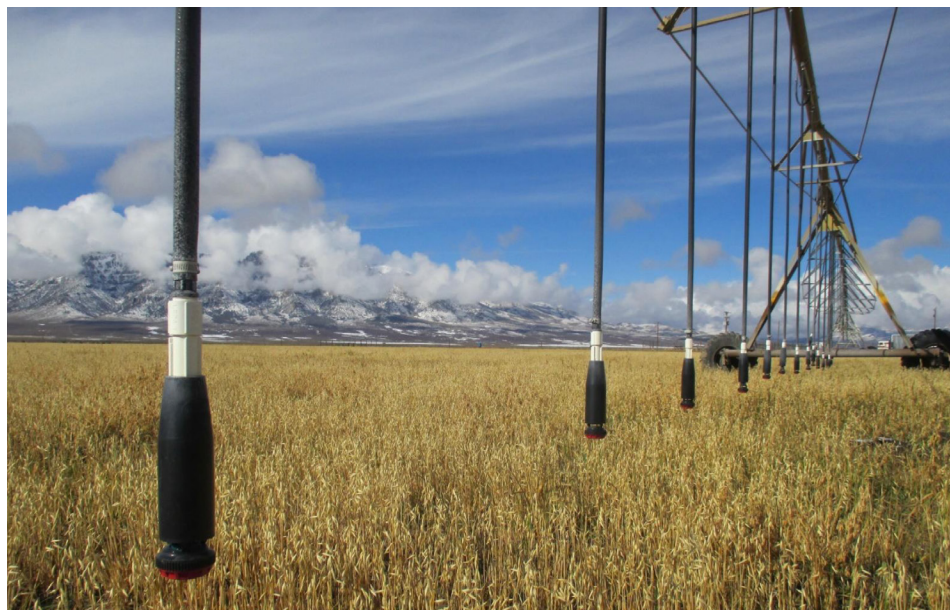
Mike Telford, who farms with five of his sons in the ESPA region, including son Mark, tried the LESA retrofits on a 50-acre field of corn near Arco. “We let it drag through the corn, and we thought, boy, this is going to be a wreck, but it worked out OK. They might ride up on the corn as the pivot moves around, but it didn’t damage the crop,” Telford says.

He likes the LESA technology because it leaves the ground more moist than conventional pivot sprinklers to the point where he shut off the water when it got too moist.

He’s also used LESA technology on some farm ground that wasn’t perfectly flat, with a grade of up to 2-3 percent. “Since we put LESA on it, we have less runoff and the crop is more even,” he said.

On steeper ground, the LESA hoses may not necessarily stay in the crop canopy and might need adjustment, or the hoses might drag on the ground. The jury is still out on wheth-

LESA, cont. on Page 5



Lesasprinkler nozzles up close

LESA, cont. from Page 3

er it makes sense to use LESA on hilly ground, Neibling says.

Some of the irrigation supply equipment stores are rapidly adjusting to the demand for LESA technology, Telford says. "They're catching up to it really fast," he says. "They're creating some T-joints and Y-joints that make it easier to do the conversions at home."

Neibling found that the spacing between sprinkler nozzles can work better for different types of crops. He recommends a 3-foot spacing between nozzles for barley, wheat or potatoes. "That's the safest bet," he says. "You can take a 10-foot outlet and break it into three parts."

He also experimented with 5-foot spacing on a potato field, and didn't see any change.

Unlike Shively, who has seen some yield increases, Neibling said farmers shouldn't necessarily expect to see an increase in crop yield. "For most of our trials, we didn't see any change in yields," he said. "In Nevada, on a full pivot of alfalfa, we compared two pivots with the same crop and same soil, and statistically, there was no different in yield," he said. "But we did see a 20 percent reduction in water use with the LESA technique."

Farmers also can convert to regulators with a smaller output to save energy as well, Neibling says. Switching from 15 psi to 6 psi, for example, will



Nozzle up close

result in additional energy savings. He recommends 10 psi for flood irrigation systems, and 6 psi for well water systems. "If you reduce the pressure, you're going to see more energy savings," he said.

Many farmers are taking a wait-and-see approach to the LESA technology, depending on how flat their fields are, or whether they face water cutbacks in the ESPA region. "You don't want to be the first one to try these new technologies, and you don't want to be the last," says Jeff Raybould, who farms in the Egin Bench area near St. Anthony. "We've got a lot of hilly terrain, so I'm still a little skeptical about it."

Brice Beck, general manager of Butte Irrigation in Paul, said he sees the new LESA technology as a helpful option for producers who need to reduce their water consumption, but he thinks it has limitations so it won't work for everyone. "If they have uneven terrain or tight soils, it may not work very well," he said. "Converting old pivots is going to be more expensive, too." Rusty fittings will be hard to break loose, and sometimes they have to be removed with a torch, which can increase labor costs, he noted.

Neibling says he expects that LESA technology will work on roughly half of Idaho's irrigated farm land.



LESA can double the number of sprinklers

"I think what we're seeing is a real opportunity to use new technology to address water cutback requirements and still produce the same crop or close to the same crop," Neibling says.

Steve Stuebner writes about voluntary conservation projects on a regular basis for Conservation the Idaho Way.



LESA juxtaposed with a conventional irrigation system in the background.