



Crops suffer when irrigation water contains too much salt. But you may be able to reduce the problem by getting beneficial bacteria in the soil.

Above > There was a 0.6-bale-per-acre payoff when David Pearson tested the biological soil amendment SuperBio in highly saline irrigation water on this farm near O'Donnell, Texas.

A biological approach lowers losses to high salinity

By Chris Bickers

Like most agricultural crops, cotton doesn't fare well when the water used to irrigate it is salty. For that reason, cotton growers who irrigate find it hard to make optimum yields in areas where the chloride content of the water is high. Some years, just getting a crop up and growing can be a challenge.

That's the situation David Pearson finds himself in. Pearson farms near O'Donnell, Texas, 45 miles south of Lubbock. He irrigates with water from the declining Ogallala Aquifer. The chloride content of that water is often 700 to 1,300 parts per million. "Salinity that high tends to cause emergence problems with cotton," says Pear-

son. "Seedlings just don't get as big as they would with a lower salt content, or they may not come up at all."

The problem is so bad that some of Pearson's neighbors have simply given up on irrigated agriculture, he



says. He isn't ready to quit, however. He has tried to alleviate the condition by applying several different soil amendment products to buffer his

cotton from the effects of high salinity. Some have helped, some haven't, but he has kept looking for one that will make a major difference.

Now Pearson thinks he may have found it. In 2001, he experimented for the first time with a product

High salinity tends to cause emergence problems with cotton seedlings—they don't get as big as they would with a lower salt content, and they may not come up at all.

called SuperBio Ag Blend. Manufactured by Advanced Microbial Solutions of Pilot Point, Texas, it contains naturally occurring bacteria—

Bacillus, Pseudomonas, Actinomycete, Cellulomonas and Corynebacterium—all designed to bring soil into balance.

With the help of UAP Southwest salesman Doug Davis, Pearson set up a test under a pivot that draws on particularly salty water. On half of the circle, he injected SuperBio into the irrigation water twice—once on Feb. 3 and again on April 25. He planted on May 6. When the plants emerged, there was a visible difference in the size of those on the treated land compared with those on the untreated. “Where we applied SuperBio, the crop shrugged off the salinity,” says Pearson.

There was a substantial yield difference, too. The treated cotton yielded 2.98 bales an acre while the untreated check yielded an average of 2.4 bales an acre.



SHAWN WADE

Bacteria help peanuts overcome chloride, too



Cotton isn't the only crop that needs help when irrigation water is salty. Peanuts are even less tolerant of salinity than cotton.

SuperBio has made a big yield difference in peanuts irrigated with high-salinity water, says Stephen Sexton, technical sales

director with SuperBio manufacturer Advanced Microbial Solutions of Pilot Point, Texas.

“In one test we conducted in 2001 near Lamesa, Texas, we saw an increase in yield of over 20 percent per acre where we used SuperBio on Virginia peanuts,” says Sexton. “This was on very light soil with low organic matter.”

The normal recommended rate of SuperBio has been 1 gallon per acre, but Sexton says that because peanuts are so intolerant of salt, a rate of 2 gallons per acre on peanuts is recommended wherever salinity is a serious problem.

SuperBio is not a silver bullet for any crop. But bacteria in the soil profile are critical in driving the fertility process, says Sexton. “They contribute to cation exchange and nutrient retention.”

The 0.6-bale-per-acre advantage for the treated acreage was dramatic enough to convince Pearson. “I will use SuperBio on all my irrigated acres of cotton in 2002,” he says.

Adding SuperBio to the soil profile makes elements in the soil more available to the plant, says UAP's Davis. “That can help the plant overcome the handicap of high chloride content in the water.”

Davis was impressed with SuperBio's

performance in the O'Donnell, Texas, test—one of the first uses of the product in the area. “When a single product makes this much yield difference, that is the kind of product I want to promote to my customer base,” he says.

Other weapons in the salt war

Pearson won't rely exclusively on the biological product to deal with salinity. On the farm where the test was conducted,

two other practices have made a difference—crop rotation and deep ripping.

The farm, which Pearson leases, is on a rotation of two years of cotton followed by two years of small grains. “This [puts] a lot of organic material in the soil, which is a deep sand,” says Pearson. “Organic matter seems to help offset some of the effects of high water salinity.”

Pearson credits his landlord, John Campbell, with developing this rotation program. Campbell, who is also a farmer, tends the circles when small grains are being grown.

“There is a definite increase in yield, probably around 20 percent, compared to continuous cotton,” Pearson says. “This rotation allows the rainfall to soak in, and it tends to reduce soil erosion when we have hard washing rains in May and June.”

Pearson also deep rips all his irrigated cotton land to a depth of 14 inches. A major benefit from this practice is, again, improved water movement through the soil.

“Deep ripping increases the permeability of the soil and gets the salts that have accumulated to wash down,” says Pearson. “That way, when natural rainfall comes along, it takes the salt down below the root zone, where it can't harm the crop.”

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Above >

Biologicals can help overcome the handicap of water with high chloride content, says UAP Southwest sales associate Doug Davis (right) to John Campbell.