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Fixing Salt Slicks

Our history of gas and oil production in this area, combined with poor draining of heavy clay fields, leads to a very common problem in our fields, salt slicks. Salt slicks can be anywhere from a few dozen feet to a few acres in size, but are areas where crops have a hard time germinating and erosion is worse.

The name “slick” comes from that usually the soil is flat, almost shiny, and can be dark black or salt white. In most cases the soil is wetter in the spring due to poor drainage, however, it will be a hard crust in the summer due to poor soil structure.

In this area, the most common cause of a large salt slick is from a gas or oil well. It could have been from the well itself or a broken wastewater line under the ground. Smaller spots can also be natural, where a slow water seep or high-water table is coming out of the ground and then evaporating, leaving the salts behind.

Officially, slicks are caused by soils that have an excess of built-up salts, called saline soils. If these salts are primarily sodium, it's called sodic soils. Salt in the soil is measured in electrical conductivity (EC), and anything above 4000 mhos/cm is classified as saline. A soil that has more than 15 percent sodium on its exchange sites is classified as sodic soil. A saline-sodic soil has both too much salt and too much sodium.

Besides being a spot where crops do not grow well, saline soil slicks will often have poor drainage and erosion issues that make it worse. They commonly have pronounced plow pans because the soil was wetter than the rest of the field when it was worked. During the summer the spots will be white from the salts at the soil surface. Oddly enough, the soil under the crust will be soft and friable. This is caused by the salts neutralizing the negative charges of the clay and keeping everything “fluffy”.

Sodic spots will have the same poor drainage, plow pan, and erosion issues, but the soil will be hard. The sodium has separated the clay particles so much that the soil has collapsed, making it very hard when dry. Sodic spots can be white if enough salt is present but can also be very dark

because the organic matter and humus are floating to the soil surface.

So how is it fixed? First, you have to know what the problem is and just how bad it is. A salt alkali test, taken like a normal soil test over the problem area, will give the soil pH, EC, and sodium percentage. If the gas wells are still active, then a break in the wastewater line may need to be fixed. Do NOT dig these yourself because a line of pressurized natural gas could be nearby as well.

Applying gypsum can be one of the first steps to remediation, but will only help if it's sodic soil, not saline soil. The calcium in the gypsum replaces the sodium on the clay surfaces, allowing it to be leached out. Regular ag lime, while also containing calcium, will increase the pH of the soil which may already be too alkaline. If gypsum is applied to saline soil, but not a sodic one, it can act as a salt that will make the problem worse. This is why soil testing is absolutely necessary.

The next step is improving drainage. In the majority of cases, the salt slicks have poor drainage and likely standing water. Some dirt work could be needed to get the water off the area when it rains. If possible, it will help to add organic matter, like straw or corn stalks, and keep the spot covered. This will help with crusting and allow rain to infiltrate the soil. Bermudagrass is fairly salt resistant and can act as both an erosion control and cover.

The last step is time, likely 3 to 4 years. The only way to get a sodic or saline slick repaired is to create conditions where leeching is possible, and then wait for the salts to slowly leech into the lower soil profile. Tilling the area during this process will only move the salts back onto the soil surface, make the salt slick larger, and is partly responsible for the plow pan that has been making the problem worse. I realize that it will be annoying to have a couple of area spots in the middle of a clean field, but this spot didn't grow anything anyway. This is why salt slicks are really only worth fixing if pretty big in size. The little natural ones caused by underground features likely aren't worth even worrying about.

Please give me a call if you have salt slicks in your field and need some advice on what to do. The first step will always be to take a proper salt-alkaline soil sample. Each office in the Wildcat District has soil probes available to use.

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