KANSAS STATE UNIVERSITY | Extension Wildcat District

FOR IMMEDIATE RELEASE

For more information, contact: James Coover
Crop Production Agent, Wildcat Extension District
jcoover@ksu.edu, (620) 724-8233

Fixing Salt Slicks

Our past history of gas and oil production in this area, combined with poor-draining 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 the fact that the soil is usually 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. It will often have a hard crust in the summer due to poor soil structure, although in the right conditions, it can be very dark, friable, and loose, resembling excellent soil.

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 from a broken wastewater line under the ground. Smaller spots can also be natural, where slow water seepage or a high water table emerges from the ground and then evaporates, 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 soil is measured in EC (electrical conductivity), and anything above 4000 mhos/cm is classified as saline. A soil that has more than 15% sodium on its exchange sites is classified as a sodic soil. A saline-sodic soil has both too much salt and too much sodium.

Besides being a spot where crops don't grow well, saline soil slicks typically have poor drainage and erosion issues that exacerbate the problem. 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 is often 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 sufficient salt is present, but they can also be very dark because the organic matter and humus are accumulating at the soil surface.

So how is it fixed? First, you need to understand what the problem is and its severity. 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 it's possible that a break in the wastewater line will 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 in remediation, but it will only be effective if the soil is sodic, not saline. The calcium in the gypsum replaces the sodium on the clay surfaces, allowing it to be leeched out. Regular ag lime, which also contains calcium, will increase the pH of the soil that is already too alkaline. If gypsum is applied to a saline soil, but not a sodic one, it can exacerbate the problem by acting as a salt. <u>This is why salt alkali soil testing is absolutely necessary.</u>

The next step is improving drainage. In most cases, the salt slicks have poor drainage and likely contain standing water. Some dirt work may be needed to divert water away from the area when it rains. If

possible, adding organic matter, such as straw or corn stalks, and keeping the spot covered will help. 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 measure and a cover.

The last step is time, likely 3 to 4 years, but it could be much longer in heavily salted areas. The only way to repair a sodic or saline slick is to create conditions that allow leaching, and then wait for the salts to slowly leach into the lower soil profile. Tilling the area during this process will only redistribute the salts back onto the soil surface, making the salt slick larger, and is partly responsible for the plow pan that exacerbates the problem. I realize that it will be annoying to have a couple of areas in the middle of a clean field, but this spot didn't grow anything anyway. This is why salt slicks are only worth fixing if they're quite large 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 is always to take a proper salt-alkaline soil sample. Remember, soil probes are available at every K-State Extension office.

For more information, please contact James Coover, Crop Production Agent, at jcoover@ksu.edu or (620) 724-8233.

# # #