PRESS&DAKOTAN

Saturday, 12.19.15
ON THE WEB: www.yankton.net
NEWSROOM: news@yankton.net

SD NRCS Officials Release 2015 Cropping Systems Inventory Results

HURON — More farmers across South Dakota are using conservation in their cropland management systems than a decade ago announces officials with the USDA Natural Resources Conservation Service (NRCS).

Results of the 2015 South Dakota Cropping Systems Inventory were released Dec. 1. Jeff Zimprich, head of the USDA Natural Resources Conservation Service (NRCS) for South Dakota presented the 2015 results at the joint annual conventions of the Ag Horizons and SD Association of Conservation Districts.

The new NRCS South Dakota report is not available from other sources and is a statistical 'snapshot in time' for the types of cropping systems farmers are using. Announced were changes from 2013 and long-term trends for county-level data and cropping systems in use statewide. Nearly one-third of South Dakota counties have seen significant changes and 30-year trends for use of conventional tillage versus no-till systems show progress for S.D. agriculture.

Zimprich says, "The type of cropping systems make a difference in production, water quality, and how soil holds water — infiltrating it versus allowing it to runoff. These benefits are also important for South Dakota's agriculture industry. Consumers know that healthy natural resources are important and consumers also want to know that the food they eat is grown sustainably. These trends in conservation practices lean toward more sustainable farming and this is good news for South Dakotans."

The results of the 2015 Cropping Systems Inventory shows an upward trend in no-till farming systems in South Dakota acres since the 2013 inventory, and up significantly from 2004. The 2015 inventory found use of no-till cropping systems to be predominant on 46 percent of South Dakota cropland (6.47 million acres). A cropping system that leaves more than 30 percent residue cover on the soil surface after planting (including no-till) was used on more than 65 percent of the state's cropland. For the first time, the overall percentage of acres under conventional tillage was down slightly, however, the location of those acres shifted.

Cropping systems impact the health and productivity of soil — the foundation of South Dakota's agriculture industry. Zimprich says, "This is why NRCS is focusing on helping farmers and ranchers improve the health of their resources. Soil health matters. Healthy soil is the key to the sustainability of our resources, the key to the productivity, profitability and resiliency of our farms and ranches; and it's the key to reducing or eliminating any off-site water quality impacts of agricultural production."

Farmers with advanced cropping systems include conservation practices such as no-till, diversified cropping rotations and cover crops. The number of counties with more than 75 percent of their cropland acres under a no-till system increased from 4 counties in 2004, to 14 counties in 2013, to 17 counties in 2015. While the overall acres under no-till increased, in eastern South Dakota, 8 counties decreased their no-till cropland acres.

Zimprich says, "Using cropping systems that don't disturb the soil, that keep the soil covered, that keep live roots growing year-round, and that use diverse cover crop mixes and crop rotations, are the tools that enable our farmers to improve soil health. Farming leaders across South Dakota like Joel Erickson, who farms in Marshall County, Steve Reimer who farms near Chamberlain, Jorgensen Farms in Tripp County, and Al Miron in Minnehaha County are a few of many who are demonstrating long-term success and profitability with practices that focus on healthy soil."

To learn more, contact the NRCS staff found in your local USDA Service Center. A summary of the inventory is online at www.sd.nrcs.usda.gov, under "newsroom."

A Compost Option

Compost Tea May Be Viable Solution To Compost Application

BY RITA BRHEL
P&D Correspondent

PHOTO: METRO GRAPHICS

It's no secret that leftover plant residue in the field can benefit future crops through moisture retention and increased soil fertility. That's part of the idea behind no-till.

Even better than no-till is compost — organic matter decomposed to the point of being highly bioavailable to crops — especially for organic producers whose use of commercial fertilizers is limited. However, once the weeks- to months-long process for making compost is completed, the producer then must manually apply it to his fields.

Compost tea takes composting a step further. Making a liquid solution out of compost can streamline the process of applying bioavailable organic nutrients to through field, such as through irrigation lines.

In addition to enhancing plant health and soil fertility by providing plant nutrients, as with traditional composts, anecdotally compost teas applied directly onto plants also minimize disease and lower fungicide requirements, said CeCe Crosby, a soil science graduate student at Washington State University in Pullman, Wash., during a recent online presentation about the research behind compost teas.

"[Compost tea] is considered an experimental pesticide," said Lynne Carpenter-Boggs, associate professor in the Department of Crop and Soil Sciences also at Washington State University, adding that research results on this claim of disease suppression remain mixed.

"Sometimes it suppresses disease. Sometimes it worsens disease. Sometimes it enhances plant growth. Sometimes it reduces harvestable yield. Sometimes it increases harvestable yield," Carpenter-Boggs said. "Sometimes there is no effect."

These variable results indicate a need for more research, yet "there are dozens of studies showing the use of compost teas reducing or controlling diseases," Carpenter-Boggs said, which prompted her and Crosby to explore possible biological mechanisms for this.

At the top of the list is competition for resources in the field's ecosystem.

"If you have a lot of pathogens, it's less likely that any one will explode," Carpenter-Boggs said. "In soils, we call this the general suppression effect."

Other possibilities being considered include predation, antagonism, stimulation of the plant's responses to disease or interference with the disease life cycle.

An exciting area of plant research happening now is seeking materials and conditions that induce a plant immune response prior to an actual pathogen attack, like a kind of vaccine for plants.

"Compost teas are definitely not the only materials being researched to use that stimulate a systemic acquired resistance," Carpenter-Boggs said.

But compost teas may be found to fuel this type of plant response.

At this point, research is considered too limited to make a recommendation to use compost teas in this manner. It is not a viable option for certified organic operations.

"Compost teas are not currently registered with the EPA as pesticides. It is illegal to sell compost teas as pesticides," Carpenter-Boggs said. "You should be thinking of teas more as a supplement and to enhance plant health."

Part of the research results variability is likely due to the inherent variability in making compost teas. There are often inconsistencies between different composts used as the base for the solution, with teas from the same compost source and even among tea from the same batch.

"By changing the way you brew it, you'll actually get a different tea," Crosby said. "We can brew different compost teas from the same compost source."

The process of making compost tea, in the most basic sense, is mixing compost with water and allowing it to steep for several weeks. While there is brewing equipment available to make a more consistent batch, passive steeping is lowest cost.

"There is potential for anaerobic conditions, which makes it have a foul odor," Crosby said. "The static brew tends to be very smelly."

The proportions of teas are 1 part compost to from 1 to 100 parts water. Inoculants, sugar to serve as microbe food, plant nutrients, rock powder and additives, such as kelp extract and molasses, may also be added with the goal of creating a certain nutrient composition, Crosby said.

"The goal is to extract the microbe nutrients from your compost," Crosby said. "Nutrients come from the ingredients."

The process of making tea seems very simple, but many factors can affect what microbes on in the end result, such as temperature, aeration, different composts and various additives like sugar.

"Different recipes have significantly different pH," Crosby said, "one of those factors that we can monitor to see if we have consistency in our teas. So if you brew a tea with a pH of 7 and you brew one with a pH of 5, you know something is going on."

Not only is the end result of what is applied to the field at stake, but careless brewing can even cause a health hazard.

"You want to be careful with your sugar source, because an addition in sugar can increase the growth of E. coli and other human pathogens," Crosby said. "It's very important that if you make compost tea, that you use the highest-quality compost. If we had a compost contaminated with a pathogen and we give that pathogen sugar and warmth, we're going to see that pathogen take over that compost tea. So you want to be careful of what compost to use."

What goes into the tea creates a certain environment, the plan of which is to grow a beneficial microbial community in a solution of specific micro- and macronutrients and pH level.

The finished tea can then be applied full strength as a soil drench or diluted to be directly placed onto plants to boost fertility. Just as the tea is sensitive to several brewing factors, its effect on soil and plants varies with myriad variables surrounding application, such as time of the day and weather.

"Soil is more forgiving," Crosby said. "It's not going to be as sensitive. The weaker the tea, the more appropriate for foliar application."

Causes of Bovine Bloat and Treatment Options

BY JAKE GEIS, DVM
Tyndall

Jake
GEIS

As we approach the holiday season, most of us will have the opportunity to feel bloated after a meal. Although this problem is only a temporary discomfort for people, bloat in cattle is a more serious issue. Since bloat can have more than one cause, being able to identify what caused the bloat will impact treatment success and prevention.

While there are multiple things that can cause bloat, there are two main categories that all causes fall in. These are frothy bloat and free gas bloat. Both are caused when the animal is unable to burp out the gases that are naturally produced by digestion. Frothy bloat occurs when a feedstuff causes the gases to become entrapped in bubbles, like a foam. Because the foam cannot be burped out, the foam continues to build and the animal bloats. Feeds like alfalfa and a high grain diet can lead to frothy bloat if they are introduced to the animal suddenly, therefore it is best to build these into the ration over the course of a few weeks.

Free gas bloat occurs when the animal is unable to burp. Often this is because the nerve that is involved in the burping process, the Vagus nerve, is inflamed. This inflammation is associated with other injuries, such as chronic pneumonia or damage to the pharynx. Other times it can occur because there is a partial obstruction of the esophagus, such as an abscess in the neck. Lastly, cattle cannot burp when they lie on their back. That's why healthy cattle that lie or fall down with their feet uphill will die if not helped upright, because they continue to digest feed and produce gas even if they cannot burp that gas out.

With either type of bloat, the most critical factor in treating cattle is to let the bloat off. The best way to accomplish this is to pass a stomach tube, allowing the gas to escape from the rumen. Use a soft, flexible piece of tubing one-half inch in diameter as a stomach tube. It is also helpful to have a metal tube to place in the mouth so the animal cannot chew through the stomach tube. This metal tube, called a speculum, should be completely smooth and not have any rough or sharp edges.

When passing a stomach tube, apply gentle pressure to the tube while slightly rolling it both directions. This will help the tube pass through two points of resistance, which are at the entrance to the esophagus and at the entrance to the stomach. Don't try to force the tube down the throat, as this can cause damage to esophagus, or it can be a sign the tube is not in the stomach but rather the lungs. Passing a tube rectally will not help with bloat in cattle, as the bloat is in the stomach and not the intestines.

Once you reach the stomach you will be able to smell the rumen gas coming through the tube. There will be no question if it is in the right spot, as it has a pungent odor. If the bloat is from free gas, the gas will race out of the tube and the animal will rapidly deflate like a balloon stuck with a needle. In addition, take the animal's temperature. If it has a fever, administer a prescription-strength antibiotic to help address the primary, infectious cause of the bloat. An over-the-counter drug, such as penicillin or oxytetracycle 200, will be insufficient. Because of this, have a good relationship with a veterinarian before you encounter this situation.

If the gas is a frothy bloat instead of a free gas bloat, only minimal gas will escape through the stomach tube. If this is the case, move the tube within the stomach to remove the larger pockets of gas, and then administer the medication proloxalene through the tube. This medication will break down the foam so the gas can be burped.

Although it is best to treat bloat early, there are situations where bloated cattle are found when they are close to death. The signs of impending death from bloat include rapid breathing, depressed attitude and a heavily distended abdomen, with the left side of the abdomen distended to or over the level of the spine. In cases like these, there may not be time to pass a stomach tube. The best emergency treatment at this point is to stick the upper left flank with a sharp knife to let the gas out quickly. This should only be done in the upper portion of the left flank and only in a situation where death is imminent. Follow up this procedure with a course of antibiotics, as the hole created can lead to infection.

After relieving the bloat the first time, the animal can bloat again in the next 12 to 24 hours. If after relieving the bloat twice the animal continues to bloat, consider talking to your veterinarian about surgical options to create a permanent hole in the flank of the bloating calf. This will allow the gas to be relieved without burping, giving the animal time to heal from the inciting cause of the bloat.

Unlike the bloat you feel after Thanksgiving dinner, bloat in cattle won't go away with a couple of capsules and an hour of watching football. However, bloat is not overly complicated to remedy if you can identify what type of bloat it is, and then treat the cause of the bloat. With timely intervention, cattle can get back to eating and burping like normal.

Jake Geis, DVM, works out of the Tyndall Veterinary Clinic.