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Ohio NRCS' new conservation practice standard for gypsum opens door for financial assistance

June 18, 2015, Chicago, IL…Ohio farmers wishing to use gypsum to improve soil quality now have access to technical information and possible financial assistance through their local Natural Resources Conservation Service (NRCS) office.

Ohio's state NRCS technical staff recently adopted an interim practice standard providing guidelines for how gypsum can be incorporated as part of various conservation programs including the Environmental Quality Incentives Program (EQIP). Indiana's NRCS state office has also adopted an interim standard on a trial basis while a national standard is being developed.

Many Ohio farmers have experimented with gypsum as a source of crop nutrients and tool to increase water infiltration, decrease erosion, expand rooting and reduce nutrient losses.

Dave Brandt set up a trial two years ago to test gypsum's impact on soil quality at his Carroll, OH, no-till operation. At a field day Brandt and his family held this past April, Brandt told farm visitors, "Water infiltrated into the soil better where we applied the gypsum two years earlier."

Todd Hesterman, a farmer and certified crop advisor in Napoleon, OH, has used gypsum on his own farm and has made recommendations for gypsum to other growers as an independent agronomist working with Nester Ag.

Hesterman says he's seen better water infiltration, especially on lakebed soils where crusting and ponding are problems due to high magnesium and low calcium levels.

"If pH is in line and the magnesium base saturation level is high, gypsum can be a great way to counter that and get sulfur into the soil as well," Hesterman explains.

Joe Nester, a Bryan, OH, based agronomist who owns Nester Ag, has seen similar results on clay-based soils across the Western Lake Erie Basin, as well as in the glacial till soils that expand into northeast Indiana and Michigan.

"We use gypsum in situations where soils are carrying high levels of magnesium, an element that can make clays tight and can antagonize infiltration rates," Nester explains. "Water infiltration is an extremely important component of healthy soils. Too much saturation for too long can add length to the duration of stress on our crops."

Researchers at Ohio State University have studied gypsum's impact on water quality. In a study at multiple commercial sites, the Ohio researchers are demonstrating gypsum reduces soluble phosphorus concentrations in tile water runoff. In the first two years of the ongoing study, farm fields treated with gypsum had an average 55-percent reduction in soluble phosphorus concentrations based on tests of water samples collected from the fields' drainage tiles.[1]

How gypsum helps

Gypsum ($CaSO_4 \bullet 2H_2O$) contains about 20 percent calcium and 16 percent sulfur in sulfate form on a dry matter basis, however nutrient values vary depending on the specific source of the product. Beyond providing valuable nutrients, soil scientists have observed gypsum can improve the physical properties of certain soils, particularly those with high clay content. The calcium in gypsum helps to build soil aggregates and create pore spaces within the soil profile.[2]

"Gypsum alters soil chemistry," notes Ron Chamberlain, lead agronomist and director of research for the GYPSOIL division of Beneficial Reuse Management. GYPSOIL sells gypsum to farmers in 21 states in the Midwest, Mid-South and Southeast. "The sulfate in gypsum binds with excess magnesium in the soil to form soluble Epson salts that are flushed lower into the soil profile. The magnesium is then replaced by the gypsum's calcium which improves water holding capacity, root development and soil structure.

"Good soil structure helps prevent compaction and problems with runoff, ponding and erosion," Chamberlain says.

Nester says many soils are also deficient in sulfur as a crop nutrient. "Gypsum can provide an economical source of sulfate over several years," he says.

Practice code details

Ohio's new interim practice standard called, "Amending Soil Properties with Gypsiferous Products (Code 801)" lists four distinct conservation purposes for gypsum applications, including:

- Improve soil health by increasing infiltration and improving physical/chemical properties of soil;
- Improve surface water quality by reducing dissolved phosphorus concentrations in surface runoff and subsurface drainage;
- Ameliorate subsoil aluminum toxicity;
- Improve water quality by reducing the potential for pathogens transport and other contaminant transport from areas of manure and biosolids application.

The Ohio practice standard stipulates qualified gypsum applications must be used to alter the physical or chemical characteristics of soil to help achieve one of the purposes. The practice does not apply to soils with cation exchange capacity (CEC) of less than five, soils with pH of less than 5.8, soils with with extractable magnesium less than 200 lbs/acre or soils used for organic production.

Payment schedules

In addition to technical information, the new standard spells out NRCS financial assistance options for gypsum applications. In Ohio, approved growers are eligible to apply to receive approximately $21 to $36 per acre depending on the application rate. Minorities and veterans are eligible for additional incentives.

"An interim standard is put in place for a new conservation practice and used generally for 3-5 years during which time the practice will be evaluated for both its effectiveness as a practice and its effectiveness when used as part of a conservation system," says Chris Coulon, public affairs specialist for Ohio NRCS.

For Ohio growers that operate in the Western Lake Erie Basin watershed, additional incentives may also be available through the Regional Conservation Partnership Program grants as part of the Tri-State Western Lake Erie Basin Phosphorus Reduction Initiative.

For more information about using gypsum as part of on-farm conservation programs, visit your local Ohio NRCS office or find links to NRCS documents at www.gypsoil.com/conservation.

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References at end.

NOTE:

For details about Ohio's new interim conservation practice standard, visit your local NRCS office or www.gypsoil.com/conservation for links to various documents, including:

Code 801:

http://efotg.sc.egov.usda.gov/references/public/OH/801_AMENDING_SOIL_PROPERTIES_WITH_GYPSUM_PRODUCTS.pdf

Job Sheet with technical information needed to make a decision about when and where to use gypsum:

http://efotg.sc.egov.usda.gov/references/public/OH/801_AMENDING_SOIL_PROPERTIES_WITH_GYPSUM_PRODUCTS_Jobsheet.pdf

Fact sheet of the necessary steps required to utilize the practice:

http://efotg.sc.egov.usda.gov/references/public/OH/801_AMENDING_SOIL_PROPERTIES_WITH_GYPSUM_PRODUCTS_SOW.pdf

Payment schedule for using the practice in EQIP:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/oh/programs/?cid=stelprdb1268723

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References

1 Knebusch, 2014. Gypsum Spread on Farms Could Help Keep Water Clean, Not Green, The Ohio State University College of Food, Agricultureal and Environmental Sciences news release. Link: http://cfaes.osu.edu/news/articles/gypsum-spread-farms-could-help-keep-water-clean-not-green

2 Chen, Liming, and Warren Dick. 2011. Gypsum as an Agricultural Amendment. Extension Bulletin 945. The Ohio State University. Columbus, OH.

GYPSOIL is a division and tradename of Beneficial Reuse Management LLC. Its mission is to make a positive impact in its customers' soil and crops while conserving natural resources and protecting the environment. GYPSOIL identifies gypsum supplies, assists in meeting regulatory compliance, helps growers understand the agronomics and application methods in using gypsum, and develops cost-effective distribution and transportation networks. GYPSOIL brand gypsum is distributed to crop growers in the Midwest, Delta and Southeast. www.gypsoil.com.

Joe Nester, Nester Ag, Bryan, OH

Nester Ag intern Brad Nester takes tile water sample.

Ron Chamberlain,
GYPSOIL Lead Agronomist and Director of Research

Todd Hesterman, farmer and certified crop advisor, Napolean, OH

Todd Hesterman, a farmer and certified crop advisor in Napoleon, OH, uses soil tests to guide where and when gypsum can help balance soil chemistry.

Gypsum can be applied with spreaders designed to apply bulk materials.

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