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Robert Spoerri
Beneficial Reuse Management LLC
312-784-0303
rspoerri@beneficialreuse.com

Karen Bernick
Karen Bernick Marketing Communications
563-320-2625
karen@karenbernick.com

Use Gypsum to Improve Alfalfa Yields And Quality Through Healthier Soils

May 31, 2013, Chicago, IL...Gypsum applied to alfalfa fields can help growers increase tonnage and quality, says Ron Chamberlain, director of gypsum programs for GYPSOIL™/Beneficial Reuse Management, Chicago.

Here are five reasons why gypsum is good for alfalfa:

No. 1: Excellent sulfur source

As federal regulations require power plants burning coal to meet stricter regulations there's less sulfur deposited on farm fields. Alfalfa is a sulfur-loving crop and deficiencies are not unusual. In fact, 82% of soil samples in one Midwestern state in a recent research study tested low for sulfur.¹ In addition, a 2010 University of Wisconsin plant tissue study showed that 64 percent of samples were low in sulfur even when the majority of alfalfa plants appear normal.²

"For every 10 pounds of nitrogen used to build protein in alfalfa, one pound of sulfur is removed from the soil," Chamberlain says.

GYPSOIL brand gypsum is calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). It is produced during the removal of sulfur from the flue gases of coal-fired utilities, and from fermenting corn for food products. It contains 13-16 percent sulfate sulfur.

“The sulfur in GYPSOIL can supply crop needs and because it is sulfate sulfur it is immediately available to plants,” Chamberlain says. Ohio State University research trials demonstrated that gypsum applied as a sulfur source improved alfalfa yields by 18% over a three year period.³

No. 2: Reduces Water Stress

The stress from having too much or too little water is the top reason why crop yields vary, says crop consultant Joe Nester, who owns Nester Ag, Bryan, Ohio.

“You’ve got to move water and air through the soil,” Nester says.

Nester advises growers to look at soil tests, check the CEC and see if water infiltration is a problem. In soils with a higher CEC and more clay content, Nester says he is more concerned about calcium and magnesium levels.

“I would address the calcium needs first and then apply gypsum to manage magnesium levels where they are detrimental to water infiltration and soil health,” Nester says. “Gypsum is like a firecracker. When you use it on those high-clay soils, it helps separate the clay particles, so water and air can enter in.”

No. 3: Fights Compaction

When the soil is compacted, biological activity can be limited because there is less oxygen in the soil, Chamberlain says.

“Oxygen needs to be present in the soil for the biology to work efficiently,” Chamberlain says.

“In waterlogged soils the biology shifts from aerobic to anaerobic. This drastically slows the decay of crop residues, and you don’t get optimal mineralization of nutrients from the soil parent material.”

Applying GYPSOIL helps reduce soil compaction because it contains calcium. The calcium creates a chemical shift, balancing the calcium, magnesium, aluminum and sodium present in the soil, explains Chamberlain. “By balancing calcium and magnesium, the stability of the soil particles and the aggregation of the soil improve and more water can infiltrate into the soil more quickly,” he says.

No. 4: Feeds The Soil

A direct connection exists between soil health and feed digestibility, according to Tom Weaver, who is director of Kow Consulting Association, Darlington, WI.

“Dairy nutrition needs to start in the soil,” says Weaver, who consults with dairy farmers in Wisconsin, Minnesota and Illinois. “Balancing calcium and potassium has the benefit of improving both fiber digestibility and non-fiber carbohydrates. Gypsum typically contains about 20-21% calcium, much of which is water soluble.”

Weaver continues: “The readily available sulfate-sulfur in gypsum is essential to build high quality protein in forages,” he says.

5. Enhances Hay Quality

Alfalfa growers that use gypsum often comment on how much healthier their alfalfa looks after even one application. The greener and leafier appearance is likely due to the improved nutrient status and improved soil structure over time. Healthier soils contribute to healthier plants that withstand stress and weather fluctuations. “When we look at test strips the gypsum-applied fields typically look much more robust and thriving,” Chamberlain says.

Know the Cation Exchange Capacity

The soil’s cation exchange capacity (CEC) shows how much nutrients the soil can hold. The higher amounts of organic matter and clay in the soil, the greater the CEC and the more nutrients soil can hold. Growers can change the critical balance of nutrients within the CEC by applying GYPSOIL, Chamberlain says.

When the CEC is under 10, apply 1,000 pounds of GYPSOIL per acre as a soil amendment, Chamberlain says. If the CEC falls between 10 and 15, apply 2,000 pounds per acre. If the CEC exceeds 15, use 4,000 pounds of GYPSOIL per acre. When gypsum is used as a nutrient source only, then apply 300 to 1,000 pounds per acre.

For more information about using agricultural gypsum, visit www.gypsoil.com or call 1-866-497-7645.

References

¹ The Fertility of North American Soils, Bulletin Summary, International Plant Nutrition Institute, March 2011.

² Chen et al., Flue Gas Desulfurization Products as Sulfur for Alfalfa and Soybean, Agronomy Journal, VOL, 97, January-February 2005.

³ Laboski et al, University of Wisconsin, 2010.

About GYPSOIL

GYPSOIL is a division and tradename of Beneficial Reuse Management, LLC. Its mission is to help crop growers improve their soils and increase productivity while conserving natural resources and protecting the environment. GYPSOIL brand gypsum is now available through distributors in 17 States in the Midwest, Plains and South. GYPSOIL manages gypsum distribution and marketing programs for a wide range of supply partners including utilities and manufacturing companies, diverting valuable co-products from landfill disposal to productive use as agricultural inputs. For more information www.gypsoil.com.

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Applying GYPSOIL brand gypsum after hay is harvested can provide immediate agronomic benefits, including correcting sulfur deficiencies. For more information, visit www.gypsoil.com.