ProfitPro®AG Farm Report

August 2019

ProfitProAG

More from Every Acre, Every Animal & Every Gallon of Manure

Crop Management News

by Dennis Klockenga, ProfitProAG Consultant

Plan a Fall Fertility Program Now!

Although it's midsummer and hot, now is the time to plan a soil fertility program for fall. A complete soil test is needed to determine current soil nutrient levels. Base saturation levels need to be checked to ensure that Ca is 70 percent, Mg is 10-15 percent, K is five percent and Na is less than one percent. Hydrogen should be 10 percent and is needed to replace nutrients removed from the clay colloid or organic matter for the growing crop. If the base saturation levels are too low or high, it needs to be addressed so the soil is more balanced and functional. Next, check trace nutrient levels as these play a large role in crop production. Trace minerals are necessary for many enzymatic functions that take place in growing plants. They are also the key to higher test weight and nutritionally dense crops.

The level of the organic matter in the soil needs to be high enough to support the soil biology and provide nutrients for the planned crop. To have a highly functional soil, organic matter should be at five percent or higher. Organic matter is the home and food source for the soil biology, which is the most important part as it provides the crop with all required nutrients.

Depending on the starting point, soil profile changes take from one to five years. The focus needs to start with soil health, biology and organic matter. Bringing the soil nutrients into balance without addressing organic matter and biology levels is like having a tractor fueled up, ready to go and no key to start the engine. Soil biology is dependent on organic matter as this is their home and food source. The organic matter is broken down by fungal groups, which provide nutrients to plants and food to other biology in the soil. It needs to be replaced continually to maintain the organic level. Cover crops provide organic matter mostly from their root mass as two-thirds of the plant is below ground level. A growing root in the soil provides the soil biology sugars for food in addition to building soil structure. Keeping microbes fed and alive is a key to healthy soil.

Plan a soil fertility program now. It saves time and reduces stress load during harvest. To develop a tailored fall fertility program contact one of ProfitProAG's crop management consultants.

Base Dry Plant Nutrient Products

Soft Rock Phosphate (SRP)
- SRP (prill) (dry) (0.5-24-0.5-31Ca + trace elements) available in 2,200 lb tote
- Application rate: 150 to 450 lbs/Acre
- Provides calcium, phosphorus and 55 trace minerals
- 3 to 5 year breakdown in soil—one of the best ways to build soil nutrient levels
- Naturally mined product from Idaho
- **Can be approved for Organic Use**

Elemental Sulfur (E.S.)
- E.S. (prill) (dry) (95-98% S) available in 2,700 lb super tote
- Application rate: 100 to 200 lbs/Acre
- 3 to 5 year breakdown in soil
- Naturally mined product from Canada
- May reduce tight, sticky soils
- **Can be approved for Organic Use**

Potassium Sulfate K_2SO_4
- Potassium Sulfate (prill) (dry) (0-0-50-18S) available in 2,000 lb tote
- Application rate: 50 to 100 lbs/Acre
- Provides sulfur needed for seed fill
- **Choose either Conventional or Organic**

Pelletized Lime
- Pelletized Lime (prill) (dry) (0-0-0-36Ca)($CaCO_3$)
- Fertilizer pellet for faster breakdown than ag lime
- Pure form—98% calcium carbonate
- Can provide an immediate impact on soil pH
- Applies evenly and consistently
- **OMRI Listed**

Pelletized Gypsum
- Pelletized Gypsum (prill) (dry) (0-0-0-23Ca)($CaSO_4$)
- Fertilizer pellet for fast breakdown, quick availability
- Contains 17% sulfur needed during crop reproduction
- Reduces surface crusting
- Improves soil aeration and structure
- Can reduce sodium and magnesium in soils
- **OMRI Listed**

Humates
- Granular humates application rates: between 75 and 150 lbs/A (250 lbs/A for first application on low humus soils)
  - Also available in liquid and soluble powder
- Helps improve soil structure, soil tilth, root growth, water infiltration, aeration and reduces erosion
- Acts as a chelator—more nutrients available
- Stimulates soil biology—especially beneficial fungi
- May help degrade pesticides in the soil
- Naturally mined from New Mexico
- Contains 50% humic acid and 20% fulvic acid
- **Can be approved for Organic Use**

FREE Teleconference Calls

Agronomic/Livestock
3rd Thursday of the Month
August 15, 2019

Call #
1-855-212-0212

Meeting ID #
769-100-082#

Time
8 to 9 pm Central Time

For More Information or to find a Consultant in Your Area

Call **1-888-875-2425**
Ask about the **ProfitMaster™ Full-Circle System** and the **Manure Master™ Program**
www.profitproag.com

GOSS'S WILT IS BACK!

by Dennis Klockenga, ProfitProAG Consultant

After scouting many fields in West Central Minnesota, Goss's Wilt has been observed in most corn fields. This area has experienced stress from too much rainfall combined with storms that produced wind and hail. It's just enough stress for the bacteria to thrive!

Leaf Symptoms

Goss's Wilt of corn, Clavibacter michiganensis subspecies nebraskensis, is a bacterial disease that causes long and large brown lesions on the leaves that appear water soaked. The lesions have black freckles and when a corn leaf is held up towards the sun, they are quite visible. This is the best way to identify the disease as no other corn disease displays the freckles. It was discovered by plant pathologist R.W. Goss from the University of Nebraska. The disease forms a leaf lesion at the onset and then progresses further into the plant where it shuts down the xylem and phloem flow up and down the plant. Consequently, the plant can't get needed water and food to thrive and shuts down, which leaves a smaller yield, lower test weight and possibly higher moisture corn due to the inability of the plant to dry down naturally. It also displays brown mottles on the bottom part of the stalk.

Brown leaf sheath from the bottom of the stalk displaying Goss's Wilt

The newer version of Goss's Wilt displays a pinkish color on the leaves. It waits for a lesion or wound to form and uses it as an entrance into the plant. Wind or hail can cause wounds to the leaves and/or the stalk, which allows Goss's Wilt to enter and populate the plant. It typically starts at the top of the plant and works its way down. However it can also start at the bottom and work up. If the infection gets a foothold, up to 100 bu/A can be lost. So far this year, it appears to be starting at the bottom and moving up the plant.

More about the Disease

According to Dr. Don Huber, Professor Emeritus, Purdue University, Plant Pathology, applying a fungicide cancels out six of the seven genetic characteristics for Goss's Wilt resistance. Northern Corn Leaf Blight is certainly detrimental, but one must also weigh the consequences of applying a fungicide.

The Solution

Bio-Empruv™ has been tested for several years and looks promising as a preventative and curative for Goss's Wilt. **Bio-Empruv is a blend of biological stimulants, natural fermentation extracts, natural surfactants and microbial metabolites.** It stimulates the plant's defense mechanisms and improves resistance against many environmental and physiological disorders. It also boosts the plant's immune system and nutrition. The ideal application time as a foliar is at V4-V5 at 8 oz/A and 24 oz/A at V10- tassel with a quart per 100 gallons of water of **Herbolyte™ Plus**. Since most of the corn is now past tasseling, recommendations include using the entire 32 oz/A with **Herbolyte Plus** to stop the progression and help the corn mature to its maximum ability. In 2015-18, some tremendous responses were reported from using this product and a 30-70 bu/A increase was not uncommon.

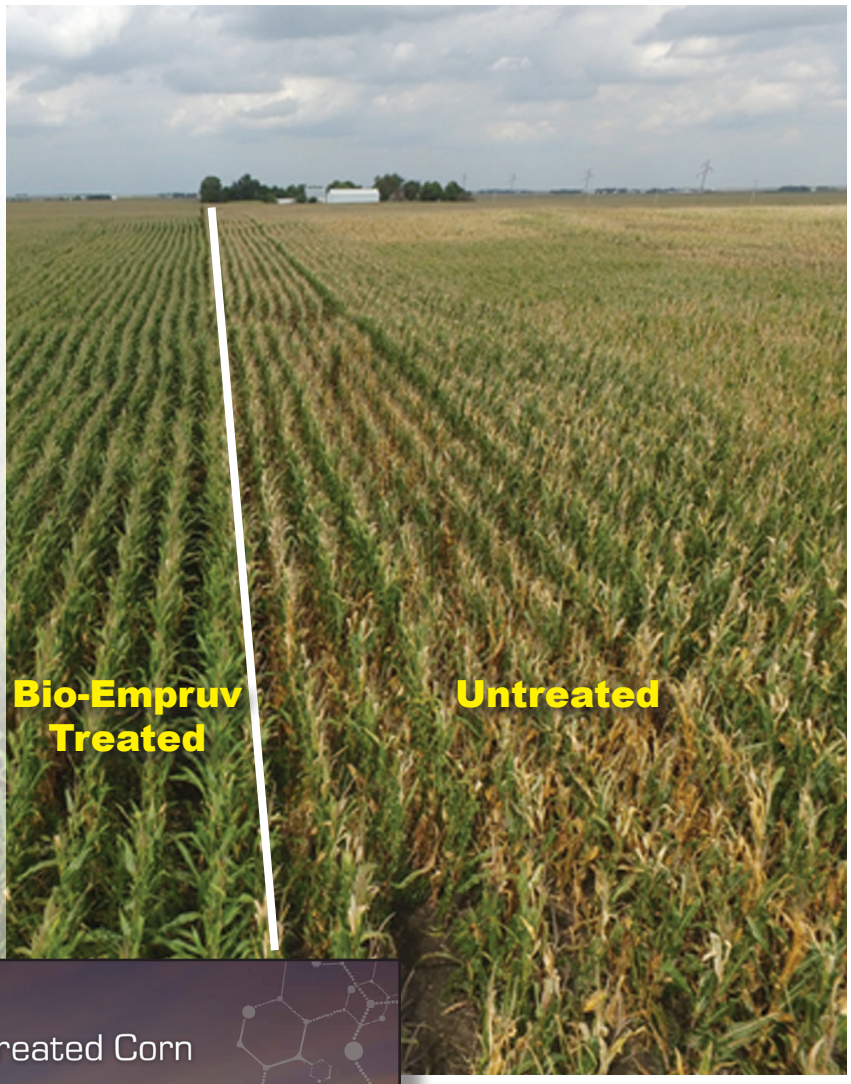
Economics

Goss's Wilt has reduced the corn crop by 1+ billion bushels annually at a cost of $4+ billion. **Bio-Empruv** is the latest weapon to help keep and improve yield.

Bio-Empruv @ Qt/A---$15.28/A
+
Herbolyte Plus @ Qt/100 @ 15 gpa water---$1.15/A

Total---$16.43/A

Using $3.50/bushel corn, a five bushel increase is needed to break even. Typical increases are generally much higher, which makes this an excellent venue to use.



Treated on the left with Bio-Empruv vs. untreated on the right

Bio-Empruv Corn & Untreated Corn

Corn Treated with Bio-Empruv
Row A - Macro Nutrients

Silicon - Si	160.57
Phosphorus - P	1,728.07
Sulfur - S	1,366.03
Potassium K	2,897.91
Calcium - Ca	169.60

Non-Treated Corn
Row A - Macro Nutrients

Silicon - Si	189.71
Phosphorus - P	377.27
Sulfur - S	809.92
Potassium - K	1,852.83
Calcium - Ca	148.30

Corn Treated with Bio-Empruv
Row D - Macro Nutrients

Silicon - Si	122.83
Phosphorus - P	1,329.77
Sulfur - S	1,271.65
Potassium - K	3,957.76
Calcium - Ca	115.27

Non-Treated Corn
Row D - Macro Nutrients

Silicon - Si	140.85
Phosphorus - P	303.31
Sulfur - S	787.14
Potassium - K	2,225.50
Calcium - Ca	101.56

Bio-Empruv™

0-9-6

GENERAL INFORMATION:

Bio-Empruv 0-9-6 contains a blend of biological stimulants, natural fermentation extracts, natural surfactants and microbial metabolites. **Bio-Empruv** stimulates the plant's defense mechanisms and improves resistance against many environmental and physiological disorders.

Bio-Empruv is an advanced generation of plant nutrients to enhance nutrient availability and uptake by the plant. It also contains natural growth promoters, enzyme precursors and nutrients to aid in crop production. **Bio-Empruv** is a blend of water-soluble plant nutrients for efficient crop use without chloride salts that can be toxic to plants. It provides nutrients in a readily available form.

GUARANTEED ANALYSIS:

Available Phosphate (P_2O_5) 9.0%
Soluble Potash (K_2O) 6.0%

Derived from mono-potassium phosphate and dipotassium phosphate.

DIRECTIONS FOR USE:

Bio-Empruv is recommended for use on all plants. It is intended to supplement and enhance a full fertilization program as recommended in accordance with a reliable Soil and Tissue Analysis. **Bio-Empruv** provides a source of immediately available nutrients, but will not, by itself, provide all necessary nutrients required during the growing season. **Bio-Empruv** is designed for foliar application.

In-furrow: Apply at the rate of 4 oz per acre.

Foliar Application on Corn: Apply at the rate of 24 oz per acre at V10 to tassel with 1 qt/100 gal of Herbolyte Plus in at least 10 gallons water per acre if 4 oz per acre was applied in-furrow. If only applying once, use 32 oz between V10 and pre-tassel with 1 qt/100 gal of Herbolyte Plus.

Aerial Application on Corn: Apply foliar at a rate of 1 quart per acre in at least 5 to 8 gallons water per acre prior to tasseling with 1 qt/100 gal of Herbolyte Plus.

Sprinkler or Pivot Irrigation: Apply at the rate of 1 to 2 quarts per acre with irrigation water. Inject **Bio-Empruv** half an hour before end of irrigation cycle.

IMPORTANT: Enough healthy leaf tissues/canopy need to be present for the material to be absorbed through the leaves.

Compatibility: **Bio-Empruv** is compatible with most fertilizers and registered pesticides. However, a compatibility jar test and small plot test is recommended before large-scale treatments are started. Always refer to product label.

STORAGE: Storage of **Bio-Empruv** must comply with all local, state and federal regulations.

Made in the U.S.A.

KEEP OUT OF REACH OF CHILDREN AND ANIMALS

Livestock & Manure Management News

by Dr. Jim Ladlie, ProfitProAG President

What is the impact of MANURE SALTS in your operation?

Salts are among the chemical constituents of manure and include sodium, calcium, magnesium, potassium, ammonium, chloride and sulfate salts, along with other cations and anions. The level of salts in manure varies, which depends on factors such as feed type and dietary mineral salt supplements. Manure can contain 25 to over 100 pounds of salts per 1,000 gallons of manure based on diets alone! One Midwestern dairy applied 800 pounds of salt per acre annually. In this case, over a three year period, their soil became more compacted and their silage yield declined due to high manure salt application.

What is Salt?

The most common salt is table salt (NaCl). What makes it "salty" is when the sodium (Na) and the chloride (Cl) break apart or dissolve into the cation (Na^+) and the anion (Cl^-), which happens quite easily when placed in water. These, and other ions of salts, can carry an electrical current through a solution. Salt ions vary in their characteristics and solubility.

How is Salt Measured in Manure?

Salts are measured and expressed in one of two ways: 1) as pounds of salt per 1,000 gallons of manure, or 2) as electrical conductivity (EC). Salts expressed as pounds per 1,000 gallons include ions such as NH_4^+, K^+, Ca^+ Mg^+ and Na^+. An EC meter measures how much electricity moves through a solution—the saltier the solution, the more electricity moves through it and the higher the EC reading. The following table (Table 1) shows the variation in pounds of salt and the EC from manure pits in a southern Iowa swine operation. The pounds of salt per 1,000 gallons varies from 30 pounds to over 100 pounds, and the EC readings correlate to the pounds of salt. The higher the salt content the higher the EC reading. Raw manure will typically be 33+ EC, but completely bioaugmented manure will be less than 7 EC.

Table 1: Manure Analysis Studies on One Swine Operation in Iowa

Manure Pit Sample ID	Type of Manure	EC (µs/cm)	Pounds Salt/1,000 gallons	Manure Type
1	Raw	19.3	63.6	Finisher
2	Raw	32+	119.5	Finisher
3	Raw	14.4	48.8	Finisher
4	Raw	33+	108.9	Finisher
5	Partially Bioaugmented	12.2	38.6	Finisher
6	Partially Bioaugmented	10.8	22.1	G. Finisher
7	Partially Bioaugmented	10.5	24.4	G. Finisher
8	Raw	17.3	90.8	Finisher
9	Raw	13.5	28.4	Finisher
10	Raw	25	84.4	Finisher

Sample date is March 2007. Pits 5, 6 and 7 had manure bioaugmentation technology added in November and was sampled in March the next year.

Impact of Salt in Livestock Operations

Salts from manure not only cause corrosion of facilities and equipment, but high salt manure applied to soil will also result in the following:

- Reduced plant growth and vigor by altering uptake of nutrients and water. In high salt soils it takes more energy for the plant to uptake water.
- Salt causes soil structure to collapse and become compacted, thus, drainage and air movement in soil is negatively impacted.
- Salts destroy biological activity, which incurs nitrogen fixation, nutrient solubility and availability.

With a continuous application of high salt manure and/or fertilizer, the soil ecosystem collapses and crop yields decline.

How can Salt Levels be Reduced in Manure?

The process of manure bioaugmentation reduces salt levels through the digestive process. An active population of beneficial microbes combines the salt ions in the manure with various organic and inorganic compounds. The salt ions, then, no longer exist as salts and the pounds per 1,000 gallons and the EC are reduced. Note in Table 1 with samples 5, 6 and 7, bioaugmenting the manure from November to March dropped both the pounds of salt per 1,000 gallons and the EC reading.

Total manure salts should not exceed 500 pounds per acre and should be less than 500 pounds per acre if rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. The salt contributions from commercial fertilizer applications should also be considered.

Table 2: Salt Analysis of Bioaugmented Swine Finisher Manure Compared to Raw Manure

Two 275 gallon totes were filled with 200 gallons of raw finisher manure. One tote was bioaugmented and the other left as a control tote.

Starting date: October 25, 2010 **Finishing date:** November 8, 2011 **Number of days:** 378 days

The totes where thoroughly mixed and sampled. The following are the results:

	Pounds Salt/1,000 gallons	EC Reading (µa/cm)
Raw Manure/Control Tote	90.6	29.8
Bioaugmented Tote	69.1	15.6

Generally speaking, for the same length of time, more salt reduction was noted, especially in an uncovered lagoon environment, than in a tote.

Agronomic Justification of Liquid Manure Bioaugmentation

The bioaugmentation of liquid manure results in improved soil health, plant health and agronomic performance. Research results show a five to 15 percent yield increase after two to three years of applying bioaugmented manure versus raw manure. There are many benefits of bioaugmentation of manure, but the agronomic benefits more than justify the cost.

The improvements in soil health, plant health and agronomic performance are due to:

- Predigestion of the manure prior to application means the manure is ready to go to work immediately without lag time for in-soil digestion, which removes nutrients and the energy required for early plant establishment.
- Reduced salt levels in the manure – improves soil health, nutrient availability and biological activity.
- The presence of beneficial microbial populations in the bioaugmented manure improves nutrient availability, nitrogen fixation and root health.
- Uniformity of application due to the improved liquidity of the manure.
- Noticeably less weeds, insect and disease pressure over a three-year period of time.
- The bioaugmented manure improves crop nutrient, energy and carbon cycling, which enhances the next crop.

Many producers reduce their rate of bioaugmented manure (predigested manure) applied per acre and yet maintain or increase yields. What is it worth to increase the amount of acres covered with the same amount of manure?

The inclusion of a biological stimulant in a cropping program can further improve soil health, crop health and yield. Research shows an additional five to 10 percent yield improvement is possible.

The following crop enhancement scenario showcases the economic benefit of bioaugmented manure.
This is based on a 2,400 head swine finishing barn with annual production of 750,000 gallons manure.

Step	Crop: **Corn**		
1.	Average yield	=	**200** bu/A
2.	**5%** yield advantage of bioaugmented manure	=	**10** bu/A
3.	Value per bushel	x	**$3.50**
4.	Income advantage per acre (yield advantage x value/bushels)	=	**$35.00**
5.	Acres treated with bioaugmented manure (bioaugmented manure ÷ gal/acre) (**750,000** gallons/2,400 head swine finisher barn ÷ **3,000** gallons/acre)	x	**250**
6.	Increased revenue from bioaugmented manure (acres applied x income advantage/acre)	=	**$8,750.00**
7.	Cost of treatment of manure applied (cost/acre = **$4.30**/A)	-	**$1,074.00**
8.	Income advantage (increase revenue – treatment cost)	+	**$7,676.00**
9.	Return on Investment (ROI) (increased revenue ÷ cost of treatment)		**7.5 Times**

Featured Product of the Month

Manure Master FoamAway™

Manure Master FoamAway™ is a concentrated dry blend designed to knock down microbial foam in swine storage facilities.

Foaming Manure Pit

Methane Manure Foam

Benefits of Manure Master FoamAway:

- Can eliminate foaming in manure pits within a week
- Residual abatement of pit foam for two months or longer
- Dry formulation and easy to apply
- Reduces the hazard potential with foaming manure pits

INGREDIENTS:

Natural-occurring, unaltered oxidized lignite, monensin sodium and diatomite, calcium montmorillonite carrier.

TREATMENT PROTOCOL:

- Use 5 pounds (lbs) per 100,000 gallons manure.
- Broadcast product evenly onto the surface of manure pits and loadouts. After surface application, the product can be watered into the manure for faster foam knockdown. **Sweep leftover product on floor surface into pit to eliminate product access by pigs.**

WARNING:
Manure pit foam can contain up to 70 percent methane, which is hazardous. Ensure adequate ventilation before treatment or agitation of foaming pits. Shutoff all ignition sources such as a heater, etc.

MANURE MANAGEMENT TECHNOLOGY AND SERVICE:

Control of pit foam requires a complete year-round manure bioaugmentation approach. ProfitProAG's Swine Manure Treatment Program for lagoons and pits includes **Manure Master Plus,™ Pit Accelerator™ along with Manure Conditioner.™** These technologies are a component of the **Full-Circle Animal, Manure and Soil-Plant System.™**

Biologically treating manure may not completely eliminate methanogen pit foaming because of variations in diet and pit environment. Treatment with **Manure Master FoamAway** may be necessary to reduce the methane foam.

Keep Out of Reach of Children

Made in the U.S.A.

For more information, call 1-888-875-2425 or visit manuremaster.com

Manure Master™

Innovative Manure Management

manuremaster.com

"The Manure Treatment Experts"

ProfitProAG

More from Every Acre, Every Animal & Every Gallon of Manure

ProfitPro®AG invites YOU to call in on the third THURSDAY of the month for the FREE TELECONFERENCE

A cost-effective and convenient way to gain knowledge on new crop production technologies

It's Easy . . . It's FREE

Thursday, August 15, 2019

8:00 p.m. Central Time

UPCOMING SUBJECTS

- **Plan a Fall Fertility Program Now!**
- **Goss's Wilt is back!**
- **What is the impact of Manure Salts in your operation?**

Dr. Jim Ladlie, ***ProfitProAG President*** and **Dennis Klockenga,** ***ProfitProAG Consultant,*** will discuss the upcoming subjects and answer questions.

For more information visit www.profitproag.com and click on "Monthly Teleconference."

DIRECTIONS FOR CALLING IN

1. Dial the toll free number **1-855-212-0212** at 8 p.m. **SHARP** (Central Time) to get in from the beginning.
2. Enter the meeting ID No. **769-100-082#** (pound or hashtag key).
3. **All calls will be muted when joining the teleconference.**
4. **To ask a question** during the Q & A portion of the program, press *6 (star six). After asking the question please press *6 to re-mute your phone.
5. **NO FEE** or pre-registration required.
6. Access the teleconference anytime between 8 to 9 p.m. (CT)