MidWest
Bio-Tech News

September, 2021

WE HAVE A LOT TO LOOK FORWARD TO

As we look ahead to the fall season and beyond, we hope the worst of the COVID issues are behind us and we can get back to business as usual. Here are just a few of the things we have on our schedule:

- Before the December newsletter is distributed, Midwest Bio-Tech will celebrate our fortieth anniversary in business. The company was founded by James and Carole Miller in 1981, and the company has been operated by the Miller family for the past 40 years. We started by working with farmers in northern Illinois and eastern Iowa and now have customers in over 40 states.
- We are planning to attend our usual schedule of winter farm shows in 2021 and 2022, and we have added some new shows to the schedule. This year, the first farm show on the schedule is the Greater Peoria Farm Show, which will be held at the Peoria Civic Center (downtown Peoria, IL) from November 30 to December 2, 2021.
- For the second year, we are one of the title sponsors of the National No-Till Conference (NNTC). The 30th annual no-till conference will be held in Louisville, KY, at the historic Galt House Hotel on January 4-7, 2022. The 2021 conference was held online due to the COVID restrictions, so we are really looking forward to attending the 2022 NNTC in person.

ABC'S OF SOIL ORGANIC MATTER

Over the years, we have shown how the Chandler crop products can enhance many dimensions of soil health, including soil organic matter (SOM). The management of SOM has been a common topic in our newsletters since 1993 as well as our nine webinars with No-Till Farmer, including our latest webinar in February, 2021.

As we explained in our earlier webinars, SOM is built when we add more plant residues to the soil than are decomposed. The top 6 inches of soil weighs about 1,000 tons per acre, so we have to add about 10 tons of new organic material per acre to increase SOM by about 1%. Although the residue from a 200-bushel corn crop weighs about 10 tons, two-thirds of the carbon in this residue is released as CO2 by the decay organisms. So, we can only rely on part of the new crop residue to build SOM, and it is hard to increase SOM faster than 0.5% per year unless we add residues from other sources (like cover crops or manure).

Carbon contracts provide payments for the external benefits of building SOM, and there are other substantial benefits for the farmer. As a rough rule-of-thumb, each one percent of SOM in the top 6 inches of soil can absorb up to 25,000 gallons of water per acre, which is roughly equivalent to 0.9 inches of rain. Also, SOM has about five times more bonding capacity than clay particles, and a 1% increase in SOM can hold enough available nitrogen to produce another 15 to 40 bushels of corn.

VALUE OF RECYCLING NUTRIENTS IN RESIDUE

When crop prices are elevated, we all know there is less pressure to manage input costs in crop production. However, the recent jump in fertilizer prices means that it can really pay to manage fertility decisions carefully this fall. The latest reports on farm-level input costs indicate that the prices for most commercial fertilizer products (urea, anhydrous ammonia, DAP, MAP, and UAN32) are now 35% to 75% higher than a year ago. Also, these prices are expected to remain high well into the 2022 crop season.

Based on the results from on-farm trials, Biocat 1000 applied in the fall can decay an additional 1.5 to 2.5 tons of corn residue per acre (or more) before the next crop is planted. To estimate the value of these additional nutrients recycled from residue, we gather retail fertilizer prices for several different sources of NPK and S and derive the average cost per pound. We multiply these costs by the nutrient content in a ton of corn residue to get total value per ton.

For this fall, the nutrients recycled from corn residue are worth $30.90 per ton. Biocat 1000 costs $10.50 per acre under our fall discount, and we deduct $5 per acre for product application. After subtracting these costs, the expected net returns from accelerated corn residue decay are:

	1.5 tons	**2.0 tons**	**2.5 tons**
Nitrogen	$15.00	$20.00	$25.00
P_2O_5	3.60	4.80	6.00
K_2O	27.00	36.00	45.00
Sulfur	0.75	1.00	1.25
Total value	$46.35	$61.80	$77.25
Application	-$15.50	-$15.50	-$15.50
Net return	$30.85	$46.30	$61.75

Undecayed soybean residue generally causes less trouble with tillage and planting than corn stalks because there is less tonnage per acre and it tends to decay faster. However, soybean residue has higher value per ton ($41.70) than corn residue because it has more nitrogen and phosphorus and nearly as much potash. By applying Biocat 1000 to bean residue, we can expect to decay an additional 0.75 tons of residue per acre (or more) in the fall. The expected net returns from accelerated soybean residue decay after deducting product cost ($5.25 for 8 ounces of Biocat 1000 per acre) and application cost ($5 per acre) are:

	0.75 ton	**1.0 ton**	**1.25 ton**
Nitrogen	$16.88	$22.50	$28.12
P_2O_5	3.00	4.00	5.00
K_2O	11.25	15.00	18.75
Sulfur	0.15	0.20	0.25
Total value	$31.28	$41.70	$52.12
Application	-$10.25	-$10.25	-$10.25
Net return	$21.03	$31.45	$41.87

For both corn and beans, we expect Biocat 1000 to net more than $2 for each dollar invested in accelerating your residue decay this fall. This boost to the decay process will continue into spring, and even more nutrients will be recycled for the 2022 crop.

OTHER BENEFITS OF ACCELERATED DECAY

One year ago, we reported on the derecho or land hurricane that swept across Iowa and into northern Illinois. Due to the large amount of downed corn caused by this storm, many of our customers applied Biocat 1000 to these fields last fall. Since last fall, we have received several reports on how well Biocat 1000 worked to break down that excess residue before spring.

Another commonly cited benefit was the reduced amount of volunteer corn in those storm-damaged fields that were planted to soybeans for 2021. As one customer from eastern Iowa reported, they could see their field boundaries all season long because their bean field was mostly clean, but the neighboring fields had plenty of volunteer corn. Biocat 1000 accelerates the decay of dropped crop and weed seeds in the same way that it helps to break down corn stalks.

COMMON QUESTIONS ABOUT RESIDUE DECAY

How does weather affect decay rates?

Microbial decay depends critically on soil temperature and moisture. The microbes in soils that are too dry or wet are dormant, so there is little to no decay activity. Also, most decay organisms are dormant below 40 degrees, but the decay rate increases rapidly as soil temperatures rise. Decay activity starts to slow as temperatures reach very high levels (about 95 degrees).

Can I apply Biocat 1000 when it is dry?

If the top 3-4 inches of the soil are mostly dry, then residue decay activity will be limited or inactive. In these conditions, you can apply Biocat 1000, and the product will remain in the soil until it rains and the decay microbes begin to work. However, if the fall weather remains dry for an extended period of time, it may be best to apply Biocat 1000 later in the fall or early spring when soil moisture conditions improve.

Can I apply Biocat 1000 late in the fall?

As temperatures decline late in the fall, the residue decay process slows, and the immediate impact of Biocat 1000 will be limited. However, many of our customers still make late-season applications of Biocat 1000, especially if they are also spraying fall burn-down herbicides or liquid fertilizers. Although the amount of decay activity may be limited as temperatures cool in the fall, the product will be there to multiply the decay organisms as the temperatures warm into the spring season.

Should I apply extra N to corn stalks?

As the decay organisms multiply, they need nitrogen to form proteins and other N-based compounds required for life (just like we do). Although the residue decay process releases N from the stalks, it needs some initial nitrogen to build the microbial populations. If the available N in the soil is limited, the process can have a slow start.

Based on our calculations, the residue decay process requires about 13 pounds of nitrogen to break down each ton of corn stalks. During a typical fall season, we may expect to break down about 1.5 to 2 tons of residue, which requires about 20 to 25 pounds of N. Most corn fields will have this much residual N available at the end of the season, so additional nitrogen is not usually required to decay this residue.

However, there are some situations in which some additional nitrogen may help to support the soil microbes and the residue decay process. Two of the most common situations include:

- If you had excess rainfall during the crop season, then you may have lost N to leaching before harvest. In this case, some extra fall nitrogen may help to make up for the lost nitrogen.
- If you sow fall cover crops, your residual N has to do double duty – growing the cover crop while decaying residue. For example, annual rye plants may require 20 to 35 pounds of N to support their fall growth.

DID YOU KNOW?

Tea is one of the most widely consumed beverages, and global tea consumption exceeds two billion cups per day. There are several distinct varieties of tea, and many of the commercial brands as well as specialty teas that we recognize in the US (such as Earl Grey and English breakfast tea) are black tea varieties.

Tea experts have long believed that the distinctive black tea flavors are created when organic compounds in the harvested tea leaves are oxidized. However, recent research shows that much of the flavor is generated by microbial fermentation.

To identify the role of the microbes, the researchers sterilized some tea leaves to remove the microbes, and they compared tea brewed from these leaves to tea from untreated leaves. The tea brewed from sterilized leaves had much less flavor than the tea brewed from untreated leaves that were exposed to the microbes.

FALL DISCOUNT PRICE LIST ENCLOSED

The newsletter includes our fall discount price list for all Chandler crop products. The fall discounts begin on September 1 and run through the end of October, 2021. You must pay for the product within the stated discount period to qualify for that discount. Also, you can place an early order, and we can hold it for delivery later in the fall or next spring.

Our Fall 2021 discount prices are the same as last spring. Also, please note that we ship all orders over $800 freight free. This means you can save the shipping costs by ordering at least ten gallons of liquid product or six or more buckets of Dry Seed Treat.

NATIONAL COVER CROP SUMMIT FOR FALL 2021

Once again, we are a title sponsor for the National Cover Crop Summit, which will meet on November 16 and 17. The online conference features free presentations by several cover crop experts. The spring edition of the summit attracted over 2,000 participants from around the world.

Registration for the National Cover Crop Summit will open soon at the Cover Crop Strategies site (covercropstrategies.com). After you register for the event, you can view all of the presentations during the two-day summit. If you have questions about the National Cover Crop Summit, send email to info@covercropstrategies.com or visit the conference website.

SOIL HEALTH LAB OPEN FOR TESTING

Let us know if you want to have us test soil samples before or after harvest this fall. We offer the Solvita tests for microbial activity based on CO2 respiration, soil aggregate stability, and amino nitrogen. We can also measure other aspects of soil health, including active carbon, organic matter, pH, and electrical conductivity.

PLANTS ADAPT TO MEET FERTILITY NEEDS

Researchers from Israel recently reported their findings on how crops raised near deserts adapt to meet their fertility needs. They noted that some local varieties of wheat and other crops did not show evidence of phosphorus deficiency despite the arid conditions. As we have reported in the past, phosphorus from soil sources is converted to a form that plants can use by microbial activity. However, the researchers found that the plants growing near deserts were able to meet their phosphorus needs from dust that settled on the leaves.

The dust blown on to the plant leaves by desert winds contains phosphorus, but it is not generally available to plants because it is tied up in the mineral structure of the dust particles. The researchers found that the local plants developed extra leaf hairs to catch dust, and the plants secreted acids that released the phosphorus.

To verify their findings, the researchers raised non-native and native plants and did not fertilize either plot. Both groups of plants soon showed signs of phosphorus deficiency, but only the native plants recovered after exposure to desert dust.

The Midwest Bio-Tech News

The newsletter is published quarterly in March, June, September, and December, and the first newsletter was published in March, 1993. An electronic archive of the newsletters published during the past 5 years is posted at our website, www.midwestbioman.com.

We only send the quarterly newsletters to past and present customers of Midwest Bio-Tech and to people who have requested additional information about our products. We do not purchase external mailing lists or gather names for the mailing list from other sources. To have your name and address added to or deleted from the newsletter mailing list, please send email to info@midwestbioman.com, call 309-659-7773, or send a letter to Midwest Bio-Tech, Inc., PO Box 156, Erie, IL 61250. Also, if you prefer to receive the newsletter in electronic form, please send us your email address.

In accordance with our privacy policy, we do not provide our mailing list or any other identifying information about our past, present, and prospective customers to any other party without obtaining their express permission in advance.

2021 FALL DISCOUNT PROGRAM
for CHANDLER CROP PRODUCTS

Chandler Products	Retail	Oct 16-31	Oct 1-15	Sept 16-30	Sept 1-15
15# bucket of Dry Seed Treat	160.00	154.00	149.00	144.00	140.00
2 to 5 buckets (per bucket)	155.00	149.00	144.00	140.00	136.00
6 or more buckets (per bucket)	150.00	144.00	140.00	136.00	132.00
Single gallon of Liquid Seed Treat	134.00	129.00	125.00	121.00	118.00
2.5 gallon Liquid Seed Treat (per gal.)	128.00	123.00	119.00	115.00	113.00
(per 2.5 gal. jug)	320.00	307.00	298.00	288.00	282.00
30 gallon Liquid Seed Treat (per gal.)	120.00	115.00	112.00	108.00	106.00
Single gallon of Chandler Soil	102.00	98.00	95.00	92.00	90.00
2.5 gallon Soil (per gal.)	98.00	94.00	91.00	88.00	86.00
(per 2.5 gal. jug)	245.00	235.00	228.00	220.00	215.00
30 gallon Soil (per gal.)	90.00	86.00	84.00	81.00	79.00
Single gallon of Biocat 1000	100.00	96.00	93.00	90.00	88.00
2.5 gallon Biocat 1000 (per gal.)	96.00	92.00	89.00	86.00	84.00
(per 2.5 gal. jug)	240.00	230.00	223.00	215.00	210.00
30 gallon Biocat 1000 (per gal.)	88.00	84.00	82.00	79.00	77.00
Single gallon of Chandler Foliar	124.00	119.00	115.00	112.00	109.00
2.5 gallon Foliar (per gal.)	118.00	113.00	110.00	106.00	104.00
(per 2.5 gal. jug)	295.00	283.00	275.00	266.00	260.00
30 gallon Foliar (per gal.)	110.00	106.00	102.00	99.00	97.00
Single gallon of Chandler Organic	116.00	111.00	108.00	104.00	102.00
2.5 gallon Organic (per gal.)	110.00	106.00	102.00	99.00	97.00
(per 2.5 gal. jug)	275.00	265.00	255.00	248.00	242.00
30 gallon Organic (per gal.)	100.00	96.00	93.00	90.00	88.00

Dry Seed Treat is priced per bucket. We offer quantity discounts for pallets of 48 buckets.
All other products are priced per gallon. We offer quantity discounts for 180-270 gal. totes.

A – The early September and October discount periods end at midnight on September 15 and October 15, 2021
B – The late September and October discount periods end on the last calendar day of the month at midnight
C – Customer must pay for product within the specified discount period to get that discount
D – You may take delivery of the product at time of payment or we can store it for later delivery
E – Prices are subject to change, and product cannot be returned for credit or exchange due to insurance regulations
F – All prices are F.O.B. Erie, IL

ORDER FORM

MIDWEST BIO-TECH, INC.

P.O. Box 156 – ERIE, IL 61250
Phone 309-659-7773

Name _____
(please print)

Address _____

City _____ State ___ ZIP _____

Phone _____ - _____

Qty	Products	Unit Price	Item Total
	15# Bkt Dry Seed Treat		
	Gal Liquid Seed Treat		
	2½ Gal Liquid Seed Treat		
	30 Gal Liquid Seed Treat		
	Gal Soil		
	2½ Gal Soil		
	30 Gal Soil		
	Gal Biocat 1000		
	2½ Gal Biocat 1000		
	30 Gal Biocat 1000		
	Gal Foliar		
	2½ Gal Foliar		
	30 Gal Foliar		
	Gal Chandler Organic		
	2½ Gal Chandler Organic		
	30 Gal Chandler Organic		

PRICES SUBJECT TO CHANGE WITHOUT NOTUCE

Product Total _____

UPS Shipping _____

TOTAL AMOUNT ENCLOSED _____

All orders over $800.00 will be shipped Freight Free.
For orders under $800, add the following UPS fee:
$18.00 for each single gallon of liquid
$22.00 for each 15# bucket of Dry Seed
$24.00 for each 2.5 gallon jug of liquid

Enclose check payable to Midwest Bio-Tech, Inc.

Please provide your shipping instructions for this order on the back of this form.

When would you like to receive the product that you have ordered?

_____

What is the best way for us to contact you about the shipping details for this order? Please note that we will only use this information as needed to complete this order, and we never provide your name or other personal information to any other party without your prior permission.

Telephone call to:

_____

Text message sent to:

_____

Email message sent to:

_____

THANK YOU FOR THIS BUSINESS!

RECOMMENDED APPLICATION RATES FOR CHANDLER CROP PRODUCTS

Chandler Dry Seed Treat

4 ounces per bushel or unit for corn, beans, and small grains and 8 ounces per bushel for alfalfa, clover, vetch, or other small-seeded crops. The actual amount of Dry Seed Treat required depends on seed size and humidity, so you should adjust the rate if you need better seed coverage or have excess treatment in the seed hopper.

Chandler Liquid Seed Treat

2 ounces per bushel for corn, beans, and small grains and 4 ounces per bushel for alfalfa, clover, vetch, or other small-seeded crops.

Chandler Soil

Broadcast 12-16 ounces per acre in the fall or spring or apply 8-10 ounces per acre in the row at planting or when side-dressing. Use the higher rate in these ranges if you are using Chandler Soil for the first time or if your soil is heavy, compacted, or poorly drained.

Chandler Biocat 1000

Corn Residue – 12-16 ounces per acre. We recommend that you use the 16 ounce rate for heavy residue in corn fields that yielded 200 BPA or more.

Soybean and Small Grain Residue – 8 to 10 ounces per acre

Chandler Foliar

Alfalfa – for new seedings, apply 10 ounces per acre. For established crops, apply 10 ounces per acre after the first spring growth. Later, apply 10 ounces per acre 10-14 days after each cutting. For seed production, apply 10 ounces per acre before flowering.

Oats – apply 10 ounces per acre at the second to third leaf stage.

Soybeans – band 6-8 ounces per acre over the row or broadcast 10 ounces per acre. The best times to apply Foliar to soybeans are at the second to third trifoliate leaf stage or between flowering and pod set.

Wheat – apply 8 ounces per acre at the second to third leaf stage. In the spring, apply 8 ounces per acre at the beginning of new plant growth or tillering.

Pasture – apply 8 to 10 ounces per acre when there is ample foliage to receive the spray.

Chandler Organic

Use the application rates listed above for Chandler Soil when using Organic as a broadcast or in-row soil treatment, and use the same rates as Chandler Foliar for foliar treatments.