MidWest
Bio-Tech News

September, 2019

DON'T BLAME THE POST OFFICE

If you thought your last newsletter was lost in the mail, you can't blame the post office. For the first time since 1993, we did not publish a June newsletter. We typically write the newsletter content in late May, but the weather was still unusually wet and cool throughout the Corn Belt. Also, the June newsletter focuses on information related to mid-season to late-season crop decisions, but many farmers still did not know when they would finish planting in early June.

We initially decided to delay the June newsletter by a few weeks until things improved, but the weather stayed wet in large sections of the Midwest through much of June. At that point, farmers with unplanted acreage were looking at the prevent-plant provisions of their crop insurance. So, we eventually scratched the June newsletter and decided to look ahead to the September edition.

DID YOU KNOW?

According to a new book published last summer, the total number of insects in the world has dropped by about 50% over the past 40 years. While that sounds like good news for those of us who spend lots of time outside, this change is bad news for the 60% of all wild bird species that eat insects. Accordingly, bird counts are also declining, and much of the change is associated with the insect-eating bird species. The other bird populations that mainly eat seeds and fruit have been largely unaffected.

SOILS CAN BE VERY RESILIENT

In the March newsletter, we reported that we carried soil samples to exhibit at the winter shows, and the samples still showed ample evidence of biological activity even though they were exposed to sub-zero temperatures. As we moved into spring and summer, we heard from several customers who noticed how evenly their soils responded despite the extremes of moisture and temperature. In one case, we visited a corn field that had been bone dry for over a month and then received over 3 inches of rain in a day. The soil had high water-holding capacity, so the rain soaked in rather than running off. Also, the soil surface was dry and dormant before the rain, but the biological activity returned to high levels shortly after the rainfall ended.

Biologically active soils can overcome other challenges that would cause major trouble in less healthy soils. For example, we received several soil samples in the past few months from parts of the Midwest that traditionally have acidic soils. Low soil pH usually limits nutrient availability and crop yield. However, most of these low-pH samples had relatively strong nutrient levels and high yield histories because they were also biologically active.

While liming and other practices can be quick remedies to some soil problems, there are lots of other issues that are difficult to manage (e.g., high pH). We are learning that microbial activity can help to offset the impact from some of these challenging imbalances.

LATEST FIELD REPORTS FROM USERS

- Soil aggregates are groups of soil particles that are bound together by decomposed organic materials. The stability of these aggregates is affected by biological activity, so we can do things to build more stable aggregates. For example, we tested soil from a central Iowa farm where Chandler Soil and Biocat 1000 were applied for the first time last spring, and some parts of the field were left untreated. The Solvita aggregate stability (VAST) results showed that the treated samples had 10% more stable aggregates than the untreated samples in just a few months.
- Some of our long-term customers have rented new ground in the past two years, and they have individually reported that they really notice the difference between the soils on their existing farms and these new parcels. In particular, all of these folks have used Chandler Soil on their existing farms for several years while the new ground was not treated. The biggest differences they tend to notice are the hardness, compaction, and poor drainage of the newly rented land. The changes in soil that occur with enhanced biological activity can be easy to overlook after many years, but the differences in treated and untreated soils can become substantial, especially when you can make these side-by-side comparisons.
- One of our central Illinois customers applied Biocat 1000 to his corn fields in late October last year. We scouted the fields in December, and there was already some evidence of accelerated decay on the corn stalks. When we rechecked the fields in July, the stalks were almost fully decayed, and we found several dropped ears that had not germinated into volunteer corn plants. In particular, we walked a 400 acre bean field and only found one stalk of volunteer corn in the entire field.

SCOUTING TIPS FOR CHANDLER SEED TREAT

During the past year, we had a large number of new customers purchase Chandler Dry Seed Treat and Liquid Seed Treat. We usually tell people what to expect from the products when we talk before the season, but that seems like a long time ago by now. Also, this season has not provided the best opportunity for making side-by-side comparisons of new products. However, if you did manage to plant some crops with and without seed treat, we have a few tips on what to look for in the field before harvest. The products benefits can differ across crops, so we provide separate tips for the major crops:

Corn – we recommend that you examine the roots of treated and untreated plants throughout the season. Treated corn plants generally have longer taps roots and more hair roots. Also, the ears tend to be longer with higher kernel counts and test weight. Finally, plant sugar readings taken with a refractometer are usually about 40% higher in treated stalks near the ear.

Soybeans – by mid-season, treated soybeans usually have longer tap roots and about 30-40% more nodules than untreated plants. If you experienced dry weather during the summer, you should find that the treated beans go into dormancy later and emerge from dormancy quicker after it rains. Late in the season, we tend to see higher pod counts, more beans per pod, and higher test weight in treated beans.

Cereal grains and grass covers – the key advantages for these treated crops are early emergence, thicker stands, and faster root development. For fall-seeded crops like winter wheat, these early advantages tend to build more plant sugar that helps the plants to survive winter and generate faster spring growth.

Alfalfa and legume covers – like soybeans, treated legumes show earlier emergence, faster root growth, and more nitrogen fixation. Last fall, we saw some late-seeded legume covers that still grew impressive root systems in a few weeks.

NUTRIENT VALUE OF CORN RESIDUE

Chandler Biocat 1000 is a liquid enzyme product that multiplies the beneficial decay organisms that convert crop residue to soil nutrients and organic matter. Biocat 1000 may be applied by itself or tank-mixed with most liquid fertilizers and herbicides. The recommended application rate is 14-16 ounces per acre for corn stalks and 8-10 ounces per acre for soybean residue and small grain stubble.

As in past years, we estimate the net returns from accelerating residue decay of corn stalks with Biocat 1000. The results are based on average decay rates from on-farm trials. The market values for the recycled nutrients are based on retail prices for four sources of nitrogen, two sources of phosphorus, two sources of potash, and three sources of sulfur.

We use average values for the per-ton nutrient content of corn residue (20# of N, 6# of P_2O_5, 30# of K_2O, and 2.5# of S). At current prices, the per-pound costs of these nutrients are \$0.44 for N, \$0.36 for P_2O_5, \$0.32 for K_2O, and \$0.12 for S. The sum of these values indicates that each dry ton of corn residue contains NPK and S worth about \$20.66. Most commercial fertilizer prices dropped recently, and these values are a bit lower than last fall.

In most years, you can expect Biocat 1000 to decay an additional 1.5 to 2.5 tons of corn residue per acre (or more) before May. At the fall discount price for Biocat 1000, the product costs \$10.50 per acre. If we also include \$5 per acre for application, the expected net returns from accelerated corn residue decay this year are:

	1.5 tons	**2.0 tons**	**2.5 tons**
Nitrogen	\$12.90	\$17.20	\$21.50
P_2O_5	3.24	4.32	5.40
K_2O	14.40	19.20	24.00
Sulfur	0.45	0.60	0.75
Total value	\$30.99	\$41.32	\$51.65
Application	-\$15.50	-\$15.50	-\$15.50
Net return	\$15.49	\$25.82	\$36.15

ADDITIONAL BENEFITS OF FASTER DECAY

Nutrient recycling is one of the most valuable benefits of accelerated residue decay, especially when the margins in crop farming are slim. However, the users of Biocat 1000 have reported several other benefits that contribute to the overall value of the product. They experience:

- Faster build-up of soil organic matter, which holds water, nitrogen, and other nutrients for use by the crop throughout the growing season.
- Fewer problems with tough corn stalks that hamper tillage implements, planter openers, and tires.
- Less trouble with heavy residue covers that keep soils cool and wet in the spring and reduce emergence rates for the following crop.
- Better control of volunteer corn and other weeds because these seeds decay before they can germinate.
- Reduced chemical carryover and fewer insects and plant diseases that use residue as winter habitat.

ARE SOIL MICROBES EXPERT TRADERS?

We have known for a long time that plant roots and soil microbes have a mutually beneficial relationship. In particular, the microbes bring nutrients to the roots and take away sugars and other compounds that they use as a food source. In an earlier newsletter, we also reported that scientists believe the microbes help the plants warn each other about the presence of predators.

Recently, botany researchers from the Netherlands found evidence that this relationship between the microbes and plant roots is much more complex than previously thought. The evidence suggests that the microbes receive larger transfers from the roots when the soil nutrient levels are lower. Just like expert traders in the commodity markets, the microbes earn higher prices when their goods are scarce.

SUMMER 2019 EVENTS SCHEDULE

We participated in the following events over the past summer:

- For the first time, we attended the North Central Region Soil Health Nexus meeting hosted by the University of Missouri at Columbia on May 29 and 30. The program included tours of the long-term research plots at Sanborn Field and demonstrations of several lab and field methods used to measure soil health.
- In early June, we visited the Woods End soil health lab in Mount Vernon, Maine. Woods End was founded in 1974 by Will Brinton, who developed the Solvita soil health tests that we use in our soil lab. The purpose of the visit was to learn about some new procedures and tools for measuring soil health in farm fields.
- Doug Miller presented recent field research on soil health tests at the fourth annual meeting of the Soil Health Institute. The meeting was held at the Hyatt Regency in Sacramento, CA on July 16 to 18 and attracted farmers plus soil health researchers with government agencies, universities, non-profit groups, and private firms from around the world.
- The National Strip Tillage Conference (NSTC) was held on August 1 and 2 in Peoria, IL. For the sixth year, Midwest Bio-Tech sponsored the Premier Lecture Series during the opening session of the conference. This year, the lecture was presented by Frank Gibbs, who is a retired NRCS researcher and is best known for placing smoke bombs in tile lines to demonstrate the porosity of healthy soils. The conferenced program included several other very informative presentations, including recent on-farm trials with corn grown in 60-inch rows.
- To keep up-to-speed on the latest corn and soybean production technology, we attended a two-day field clinic on August 27 and 28. The field event was hosted by the Eastern Nebraska Research and Extension Center in Ithaca, NE.

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, 2019. 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 later delivery.

Our Fall 2019 discount prices and the shipping fees are the same as last year. Also, please note that we ship all orders over $800 freight free. So, you can save the shipping costs by ordering ten or more gallons of liquid product or ordering six or more buckets of Dry Seed Treat.

FREE ORGANIC REPORT

We recently co-sponsored a new special report on organic no-till farming by Lessiter Media. Special Report #61 is titled “Going After Bigger Profits with Organic No-Till.”

If you would like a free copy of the report, please call our office (309-659-7773), send email to info@midwestbioman.com, or drop us a note by postal mail.

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.

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