

THE MIDWEST

BIO-TECH NEWS

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Email: info@midwestbioman.com Homepage: www.midwestbioman.com

December, 2005

POST-HARVEST RESIDUE: ASSET OR LIABILITY

Although some post-harvest crop residue is baled or stacked for use as bedding, farmers have traditionally viewed residue as a liability, especially when it comes to corn stalks. For many years, farmers chopped, disked, or chiseled their stalks and other crop residue, or they buried the stalks with a moldboard plow. In earlier days, the corn stalks were raked into windrows and burned, which sent 95% of the carbon and other nutrients into the atmosphere.

In many ways, crop residue was treated as a waste product just like manure, and there are lots of parallels between the traditional treatment of manure and crop residue. For example, researchers at a major land grant university published an article forty years ago that claimed manure was not worth the hauling and spreading costs. However, the article also noted that farmers still had to spread manure because it was the only practical way to dispose of it. Today, many livestock operations rely on manure, especially liquid manure from pits, to provide most of the nutrients required for crop production. In some case, these farms purchase very little commercial fertilizer.

Although our understanding of the value of crop residue has not changed quite as much in the past forty years, there are signs that people in agriculture are beginning to view residue as an asset. The shift in our thinking started over twenty-five years ago with a study of the nutrient content of post-harvest crop residue published by the National Plant Food Institute published. For example, the study found that the typical

corn field that produced 150 bushels per acre also generated 5 tons of crop residue per acre. On average, this residue contains 100 units of nitrogen, 37 units of phosphate, and 145 units of potash in addition to other trace elements. At the time, these nutrients were worth about \$15-20 per acre, and the current value is over \$60 per acre due to the higher cost of commercial fertilizer. Given that most modern corn hybrids are planted at higher population rates and can produce much higher yields and 80-100% more residue, the post-harvest residue in a corn field may contain 200 units of nitrogen, 74 units of phosphate, and 290 units of potash. At current values, these nutrients may be worth more than \$120 per acre.

Other views of crop residue as a potential asset have emerged in the past few years. For example, two groups of entrepreneurs recently proposed ways to collect the crop residue and distill it into methyl alcohol for motor fuel or to convert it to fertilizer. Although these projects are technically feasible, the collection, transportation, and processing of the residue will be expensive and only pays if fuel prices remain high.

As many of our users already know, there is a more practical and economical way to use this asset. You can apply Biocat 1000 to help the soil organisms to release these nutrients for the next crop, and the resulting reduction in your fertilizer bill can be substantial. For example, many long-term users of Biocat 1000 have produced higher yields without purchasing a pound of potash in the past 10 years, and they have the soil test results to show that their soil K levels have not dropped.

TIMING OF THE RESIDUE DECAY PROCESS

In addition to the input cost savings that may be gained from using Chandler Biocat 1000, our users have reported several other product benefits including fewer weeds, less trouble with rootworms and other insect infestations, fewer problems with clogged tillage and harvesting equipment, less chemical carryover, and less volunteer corn. We have received reports like these every year we have been in business, and many of our users have consistently good experience with the products each year. However, some people have tried Biocat 1000 once and report that they did not see any difference in their crops. Why do some users get great results and others do not?

The key thing we need to understand is how biological processes work and how they differ from chemical processes. For years, farmers have used chemical inputs like fertilizers and herbicides that often generate visible results in 24 to 48 hours after application. However, the Chandler Crop Products are designed to influence the biological processes in the soil and in plants that affect seed germination, plant growth, soil nutrient conversion, and crop residue decay. In general, these processes work in much different ways than the chemical processes that we have known in the past. In particular, the crop residue decay process is very sensitive to moisture and temperature, and the potential results to be achieved with Biocat 1000 depend on the timing of the product application.

To help everyone understand the nature of the biological activity behind crop residue decay, we have enclosed a brief two-page summary how Chandler Biocat 1000 works and how temperature and timing affect the potential results. The first diagram shows that the soil bacterial activity goes dormant at 38 degrees Fahrenheit but doubles for each 10 degree increase above this level. The second diagram shows the advantages of completing the decay process early. We hope the graphs help you to understand the importance of timing issue.

FOLLOW-UP REPORT ON THE DROUGHT

We reported about the severe drought that affected crop production in much of the north central Corn Belt in the September, 2005, issue of the newsletter. Given that the region most affected by the drought cuts through the center of our marketing territory, many of our users had to deal with low soil moisture and high plant stress situations throughout all of the 2005 crop year. Now that harvest has concluded in most areas, we have talked with several people about their experiences with the Chandler Crop Products this year. As in the last major drought year (1988), we have found that many people observed very significant differences between the treated and untreated crops.

The following reports indicate some of the benefits observed by our users during the drought conditions of the past year. These people kindly shared their results, but we do not report names, locations, or other identifying information in accordance with our new privacy policy that we adopted earlier this year. For more details on this policy, please refer to the June, 2005, issue of the newsletter posted at our web site.

RECENT REPORTS FROM CHANDLER USERS

- A new user who farms in central Illinois reported an 8 BPA side-by-side increase on corn using Dry Seed Treat and Soil. He also observed that his soil was more mellow with less compaction.
- A user from eastern Iowa had 195 BPA corn in an area that was over 15 inches short of rainfall during the year. He has used Seed and Soil for over 15 years.
- A user from central Illinois observed a 23 BPA increase from Dry Seed and Soil on Bt corn following corn, and his test weight in the treated plot was 6 pounds higher.
- One of our users in Ohio reported a notable yield gain where he used Soil and Biocat 1000. He finds that the soil tills easier and is not compacted.

WINTER FARM SHOWS

As in the past, Midwest Bio-Tech, Inc. will exhibit at several major farm shows during the winter months. The dates and locations of the winter shows we will attend from December, 2005 to March, 2006 are:

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|----------------------|----------------------------------------------------------------------|
| Nov. 29 to
Dec. 1 | Greater Peoria Farm Show
Civic Center
Peoria, IL |
| Jan. 11-12 | Northern Illinois Farm Show
NIU Convocations Center
Dekalb, IL |
| Jan. 15-17 | Quad Cities Farm Show
QCCA Expo Center
Rock Island, IL |
| Jan. 17-19 | Fort Wayne Farm Show
Allen County Coliseum
Fort Wayne, IN |
| Jan. 25-26 | Midwest Ag Expo
Gordyville USA
Gifford, IL |
| Feb. 11-12 | Agricultural Mech Show
Western Illinois University
Macomb, IL |
| Mar. 1-3 | Hawkeye Farm Show
University Dome
Cedar Falls, IA |

When you attend any of these winter farm shows, please be sure to stop by our exhibit booth and say hello. We always enjoy this chance to visit with our customers and get caught up on the most recent changes with your family and farming operation. We will also have the most up-to-date field results and product information available in case you have any questions about the Chandler Crop Products.

Also, if you want to pick up your product at one of the shows, please let us know at least five days before the show begins. We usually bring some buckets of Dry Seed Treat and a few gallons of liquid product to sell at the shows, but we try not to carry any extra liquid product during freezing weather. However, if we know you plan to pick up all or part of your order at the show, we can make sure to have it available if you let us know at least five days in advance.

EMAIL NEWSLETTER OFF TO A GOOD START

In the last (September, 2005) issue of the Midwest Bio-Tech, Inc. newsletter, we first announced that our readers could opt to receive the newsletter by email only or by email and postal mail (or by postal mail only, as in the past). Over the past three months, we have received a very favorable response to this new program, and this issue marks the first time we will distribute some of the newsletters by email. If you would like to receive the March, 2006, newsletter by email, please send us email at info@midwestbioman.com, send a fax to 309-659-7827, or call us at 309-659-7773. We will also include another sign-up sheet in the June, 2006, issue of the newsletter. As we noted in the initial announcement, we will not use your email address to send unsolicited promotional materials, and we will NEVER provide your email address to any third party without your permission.

NEW INFORMATION AT WWW.MIDWESTBIOMAN.COM

We recently posted copies of our new full color product brochures for Chandler Biocat 1000, Foliar, and Soil to our web page. The new brochures include the most up-to-date information about product application rates, per-acre costs, details about the major product benefits, and yield trial results from users in the Midwest and elsewhere. We have also posted a copy of the enclosed product performance sheet ("Benefits of Early Crop Residue Decay") along with other new information about the full line of Chandler Crop Products. Please visit our web page at www.midwestbioman.com to view the most up-to-date information.

IF YOU HAVE AN UPDATED ADDRESS THAT IS DIFFERENT FROM THE ONE ON YOUR ADDRESS LABEL, PLEASE SEND IT TO US OR GIVE US A CALL SO IT CAN BE CHANGED FOR FUTURE NEWSLETTERS.

Midwest Bio Tech, Inc.
Box 156
Erie, IL 61250
(309) 659-7773

Address Service Requested

PRE-SEASON DISCOUNT PRICE PROGRAM

We have enclosed a copy of the full price list and shipping cost schedule under our "Special Pre-Season Discount Program." The regular retail and pre-season discount prices for all Chandler Crop Products are the same as last year. The 12% December discount extends seven days into January 2006, so you can take advantage of the lower prices in the 2005 or 2006 tax year. The regular retail prices for all Chandler Crop Products go back in effect on April 1, 2006. Although UPS recently increased their shipping rates, we have held our shipping charges at the same level for the past year. Also, please note that all orders over \$800 qualify for freight-free shipping, and you can let us know in advance if you want to pick up your order at one of the winter shows to avoid shipping charges.



*Seasons
Greetings*

I also want to take this opportunity to say "thank you" for the privilege to have served you in the past, and I look forward to serving you in the future. I also extend to you my personal "Seasons Greetings" and wish you a "Very Prosperous New Year."

Sincerely,
Jim Miller

Benefits of Early Crop Residue Decay with Chandler Biocat 1000

Product Summary

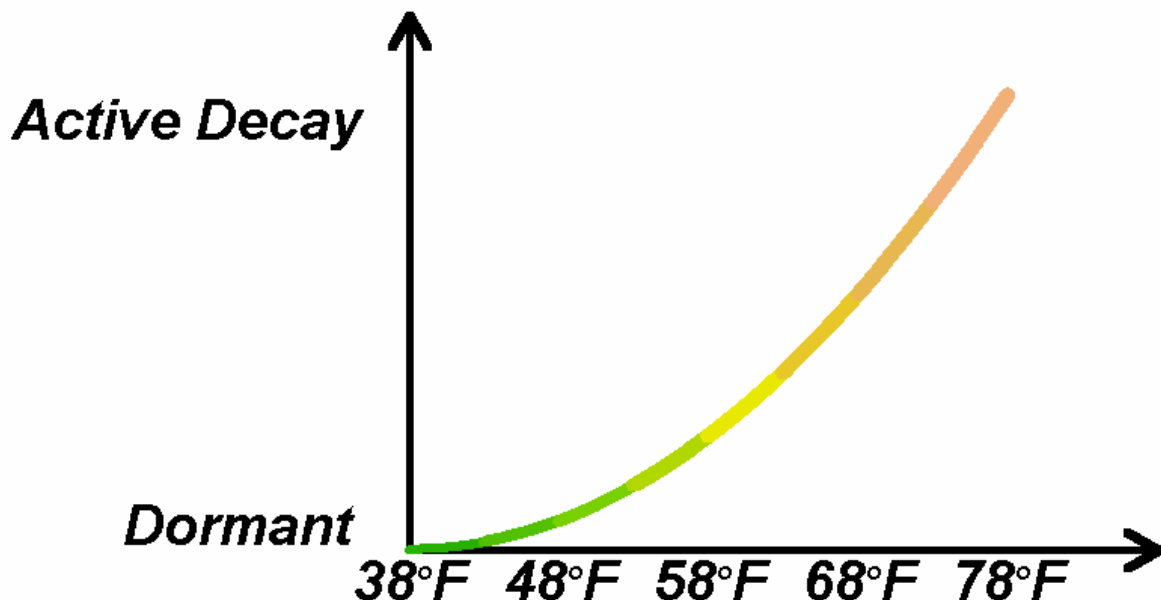
Chandler Biocat 1000 is a liquid enzyme product that accelerates the decomposition of crop residue by stimulating the growth of the naturally occurring organisms that breakdown organic compounds. The product initially works to decay the inside of corn stalks and other plant residue, and the outer shell of the plant residue is left as a soil cover to reduce wind and water erosion. Later, Chandler Biocat 1000 enhances decomposition of the outer shell, and the remaining crop residue is easily handled by planting or tillage equipment.

How to Apply Chandler Biocat 1000

The recommended application rate is 8-16 ounces per acre with enough water to provide good coverage of the residue (20 gallons per acre for most spray equipment). Biocat 1000 is compatible with Chandler Soil as well as most pesticides and liquid fertilizers in a tank mix. Chandler Biocat 1000 is also **non-toxic** and does not require special equipment or handling.

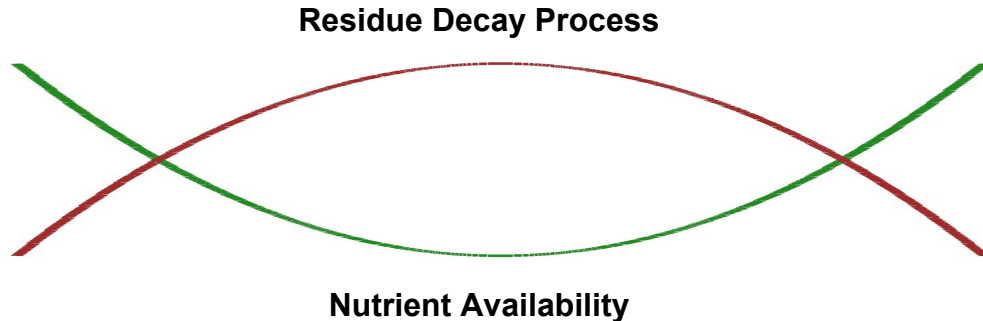
When to Apply Chandler Biocat 1000 to Crop Residue

You should apply Biocat 1000 as soon after harvest as possible in order to start the decay process early. Although the residue decay process is not killed by freezing temperatures and will continue after the weather warms in the spring, the figure below shows that most of the bacteria that decay crop residue go dormant at temperatures below 38 degrees Fahrenheit. Also, the figure shows that the amount of biological activity doubles for every 10 degree increase above 38 degrees. So, you can generate the maximum benefit from the residue decay process by applying Chandler Biocat 1000 while the weather is still warm.



Residue Decay Process and Crop Nutrient Availability

During the residue decay process, soil bacteria and other decay organisms actually tie up soil-based plant nutrients as well as applied nutrients such as fertilizer and manure. As shown in the figure below, the availability of all soil nutrients decreases as the residue decay process begins. Crop nutrient availability is lowest at the peak of the decay process, and then soil nutrient availability increases as the residue decay process concludes. Chandler Biocat 1000 should be applied as soon after harvest as possible in order to complete the decay process early, reduce nutrient tie-up, and make more soil nutrients available for production of the next crop.



What is the Nutrient Content of Crop Residue?

The typical acre of post-harvest crop residue contains the following nutrient levels:

	Tons	N	P2O5	Potash
Corn residue	5	100	37	145
Soybean residue	2	90	20	50
Oat straw and stubble	2	25	15	80
Wheat straw and stubble	2	40	10	70

The stated nutrient content of corn residue is based on a yield of 150 bushels per acre. Today, most corn hybrids can generate much higher yields and up to 8-10 tons of residue per acre, and the actual nutrient content in the residue may be 80-100% higher than the values stated above.

Recent Reports from Chandler Biocat 1000 Users:

- On May 10, 2005, a user in northwest Illinois applied 12 ounces of Biocat 1000 plus two pounds of ammonium sulfate and Roundup (for burn-down) per acre to his corn stalks. When he harvested the soybean crop on October 1, he found that the corn residue was fully decayed and he had no trouble with corn stalks fouling the bean head. The soybean crop yielded 55-60 BPA across the entire field.
- Several new customers started using Biocat 1000 after experiencing problems with corn residue that affected their following soybean crop. This seems to be especially common if the previous crop was Bt corn because the heavy residue can tie up soil nutrients, clog soybean planting and harvesting equipment, and reduce soybean yields by up to 5 BPA.
- Users experience fewer problems with corn stalks and other crop residue hampering other types of tillage or planting equipment. One user in Iowa reports that he knows where he applied the product because he can hear a difference in the crunch of the stalks as he runs his no-till planter through corn residue.
- Chandler Biocat 1000 also helps to reduce other problems associated with undecayed crop residue, including chemical carryover, insect infestations, and volunteer corn.

**2005-2006
SPECIAL PRE-SEASON DISCOUNT PROGRAM
for
CHANDLER CROP PRODUCTS**

**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 _____ - _____

<u>Chandler Products</u>	Retail	Mar.	Feb.	Jan.	Dec.
15# Bkt Dry Seed Treat	120.00	115.00	112.00	108.00	106.00
2 to 5 Bkts - Per Bkt	115.00	110.00	107.00	104.00	101.00
6 or more Bkts - Per Bkt	110.00	106.00	102.00	99.00	97.00
(Each Bkt will treat about 60 Bu. or units of seed)					
Gal Liquid Seed Treat	125.00	120.00	116.00	113.00	110.00
2½ Gal Liquid Seed Treat - Per Gal	120.00	116.00	112.00	108.00	106.00
- Per 2½ Gal	300.00	290.00	280.00	270.00	265.00
30 Gal Liquid Seed Treat	110.00	106.00	102.00	99.00	97.00
(Each gallon will treat about 64 Bu. or units of seed)					
Gal Soil	92.00	88.00	86.00	83.00	81.00
2½ Gal Soil - Per Gal	90.00	86.00	84.00	80.00	78.00
- Per 2½ Gal	225.00	215.00	210.00	200.00	195.00
30 Gal Soil	82.00	79.00	76.00	74.00	72.00
Gal Biocat 1000	90.00	86.00	84.00	80.00	78.00
2½ Gal Biocat 1000 - Per Gal	88.00	84.00	82.00	78.00	76.00
- Per 2½ Gal	220.00	210.00	205.00	195.00	190.00
30 Gal Biocat 1000	80.00	77.00	74.00	72.00	70.00
Note - Biocat 1000 is a cellulose digester					
Gal Foliar	112.00	108.00	104.00	101.00	98.00
2½ Gal Foliar - Per Gal	109.00	105.00	101.00	98.00	95.00
- Per 2½ Gal	272.00	262.00	252.00	245.00	237.00
30 Gal Foliar	100.00	96.00	93.00	90.00	88.00
<u>Chandler Organic</u>					
Gal Organic	105.00	101.00	98.00	95.00	92.00
2½ Gal Organic - Per Gal	100.00	96.00	93.00	90.00	88.00
- Per 2½ Gal	250.00	240.00	233.00	225.00	220.00
30 Gal Organic	90.00	86.00	84.00	80.00	78.00

Chandler Organic can be sprayed on the soil or as a foliar on plants

Dry Seed is priced per bucket, **the rest of the products are priced per gallon.**

A - The 12% December discount will terminate at midnight on January 7, 2006

B - The other three months discounts will terminate the last calendar day of the month at midnight

C - Customer must pay for product within the specified month to get that month's discount

D - You may take delivery of the product at time of payment or we can store it for you until spring

E - Prices are subject to change

F - All prices are F.O.B. Erie, IL

PRICES SUBJECT TO CHANGE WITHOUT NOTICE **Product Total** _____
UPS Shipping _____

TOTAL AMOUNT ENCLOSED _____
 WHEN YOU WOULD LIKE DELIVERY OF THIS PRODUCT _____

All orders over \$800.00 will be shipped Freight Free
 All orders under \$800.00 add the following UPS fee

Each 15# Dry Seed - \$9.00

Each Gal of Product - \$8.00

Each 2½ Gal of Product - \$10.00

Enclose Check or Money Order

Payable to Midwest Bio-Tech, Inc.

THANK YOU FOR THIS BUSINESS!