

# THE MIDWEST

# BIO-TECH NEWS

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**September, 2007**

## **SECOND LARGEST US CORN CROP PLANTED**

In the June crop acreage report, USDA estimated that the current US corn crop planted for all uses will cover just under 93 million acres, which is up 19% from 2006 and is second only to the 95.5 million acre crop planted in 1944. The March corn planting intentions estimate for 2007 was 90.5 million acres, and the corn acreage number continued to creep upward as we moved through the spring planting season.

USDA recently issued the August crop production report, and the US planted corn acreage number had not changed. The projected number of acres harvested for grain in the US is 85.4 million acres, which is about 15 million acres more than were harvested for grain in 2006. If US farmers actually roll combines over this much land, the US harvested corn acreage will be the largest amount since 1933.

The projected US corn yield is currently 152.8 BPA, which is up from 149.1 BPA in 2006 and is second only to the yield record set in 2004 (160.4 BPA). Based on these acreage and yield estimates, the projected US corn production for 2007 is 13.05 billion bushels, which is up 24% from last year. Of course, everyone will be watching for these estimates to change as we move into harvest, especially given the hot and dry weather that we experienced across the entire Midwest throughout August.

Planted acreage of all types of wheat also increased by 6% from last year to 60.5 million acres. Roughly three-quarters of the wheat acres are planted to winter wheat,

and most of the remaining acres are planted to spring wheat. Overall, winter wheat acreage has been increasing while spring wheat plantings have declined. The durum wheat acreage is relatively small at just over 2 million acres, but the planted acreage grew by 19% from last year.

The August estimate of harvested US acreage of all types of wheat is 52.1 million acres, which is down from the July report. The overall wheat yield is expected to be 40.6 BPA, which is also down slightly from July. When we combine the US harvested wheat acreage and yield estimates, the projected US wheat crop is expected to be about 2.1 billion bushels in 2007.

The planted soybean crop is estimated at 64.1 million acres, which is down 15% from 2006 and is the smallest bean acreage since 1995. Soybean plantings in Illinois and Iowa declined by more than 3 million acres across the two states, and large bean acreage declines also occurred in Indiana, Minnesota, and Nebraska. However, these changes were partly offset by higher bean acreages in Pennsylvania, New York, and the Southeast US. USDA projects the US harvested bean acreage at 63.3 million acres, and the expected yield is 41.5 BPA. Based on the acreage and yield estimates, the US bean crop in 2007 is expected to be about 2.6 billion bushels, which is down 18% from the production record set in 2006.

The planted cotton acreage is set at 11.1 million acres, which is down 28% from 2006 and is the smallest planted cotton acreage since 1989. Harvested cotton acreage is expected to be 10.6 million acres, and US production is projected at 17.3 million bales.

## **CORN RESIDUE: ASSET OR LIABILITY?**

Regardless of what the actual US corn yield number turns out to be, these USDA acreage statistics indicate that there will be lots of acres of corn residue in the US this year. Also, the amount of corn residue generated per acre has increased over time. In past years, fields that produced a 150 BPA corn crop also generated about 5 tons of residue per acre. Now, higher yielding corn hybrids can generate 8-10 tons of residue per acre, especially for Bt corn varieties or continuous corn farming. Consequently, residue is now a hot topic, and we have been hearing more talk among farmers and seeing more articles in the farm papers about ways to manage the large amounts of residue that will cover harvested corn fields this coming fall.

Historically, corn stalks and other crop residue have been treated as a liability in farming. For example, I can recall as a kid that corn stalks were often raked after harvest and burned in the field. Although this practice was fairly effective at removing the residue, it generated excessive air pollution and destroyed about 95% of the nutrients in the corn stalks.

To manage the corn residue in the field, most farmers used moldboard plows and other tillage implements to bury the trash. Of course, this approach was only possible after large tractors that could draw deep plows became available. However, the soil microorganisms that decay plant residue are aerobic (require air) and only work in the top few inches of the soil. So, we found that using plows to bury the residue deep under the soil surface may actually preserve the stalks. For example, we know that wood fence posts only rot near the soil surface, and very little decomposition occurs at six or more inches below ground, even if the post is buried for several years.

Over time, modern farming practices like minimum tillage, strip till, and no-till were developed to cope with the amount of corn residue in typical fields. The residue was left near the soil surface so that it could

decay and provide valuable soil cover to prevent erosion. The decayed residue also returned nutrients to the soil and generated humus to build soil structure. In this way, the residue became an asset (rather than a liability) in modern crop farming.

However, the concerns recently raised by farmers in private conversations and in the farm press indicate that these methods may not be able to handle the increasing amounts of residue generated in today's corn fields. The key conclusion to be drawn from much of this discussion is that some people are returning to the old view of corn residue as a liability rather than an asset to farming. In some cases, people have proposed old methods like raking or baling to remove the excess corn residue from the field. Given this recent change in attitude among some farmers, a person may wonder if corn residue is really an asset or liability in farming.

## **NEW INFORMATION ON MANAGING CORN RESIDUE**

For several years now, we have strongly believed that it is much more profitable to manage crop residue as a valuable asset rather than a costly liability. If the residue is removed or destroyed, the nutrients and organic materials (humus) are lost to the soil. By building an active decay program, farmers can capture the full economic value of the nutrients while also reducing the potential problems associated with undecayed crop residue in farm fields.

To explain these key points, we have included a special one-page insert with this newsletter. The insert presents some new information about Biocat 1000 and ways to manage the residue decay process, and detailed information is also provided at our website ([www.midwestbioman.com](http://www.midwestbioman.com)).

**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.**

## BENEFITS OF EARLY RESIDUE DECAY

By enhancing the residue decay process, you can avoid several potential problems and help to promote the early growth and development of the next crop. In particular, an active residue decay program helps to:

- Release nutrients for the next crop
- Break down the internal structure of the residue while maintaining surface cover to prevent wind or water erosion
- Manage heavy Bt corn residue
- Enhance warming of the seedbed in strip till and no-till systems
- Reduce implement plugging problems
- Eliminate winter harboring sites for corn borers and other insects
- Reduce chemical carryover
- Prevent volunteer corn
- Break down weed residue and reduce potential weed problems in the future
- Reduce the impact of wheat residue in a soybean double-cropping system

## HOW MUCH NUTRIENT CAN BE RELEASED?

The residue in a typical field contains the following levels of nitrogen (N), phosphorus (P), and potassium (K) in pounds per acre:

Crop	N	P	K
Corn	200	74	290
Soybeans	90	20	50
Oats	25	15	80
Wheat	40	10	70

The actual nutrient content of the residue in a particular field will vary with crop genetics, population density, stalk size, and other factors. For example, the nutrient values for corn are based on average hybrids that produce 10 tons of residue and over 200 BPA. Many farmers now plant higher yielding hybrids that have higher plant populations and heavier stalks (especially Bt corn), and the nutrient content of the residue may be higher. Depending on fertilizer prices and your cropping situation, the nutrients in your residue may be worth at least \$100 per acre.

## REVISED APPLICATION RATES FOR BIOCAT 1000

Chandler Biocat 1000 is a liquid enzyme product that contains micronutrients, amino acids, and proteins designed to stimulate the soil organisms that convert residue to soil nutrients. Biocat 1000 is non-toxic when used as directed. You should apply Biocat 1000 to the residue as soon as possible after harvest. Biocat 1000 may be applied to residue with conventional spraying equipment. Due to the increasing amount of residue in corn fields, we have revised the recommended application rates:

### Corn residue

Up to 150 BPA	10 oz. per acre
150-180 BPA	12 oz. per acre
180-200 BPA	14 oz. per acre
Over 200 BPA	16 oz. per acre

### Soybean and Small Grain Residue

8 to 10 ounces per acre

Many of our users spray Biocat 1000 with Chandler Soil in the same pass. The product may also be applied in a tank mix with other products and is compatible with most commonly used liquid fertilizers and pesticides. For example, many of our users report that adding 2-3 pounds of ammonium sulfate per acre enhances the performance of Biocat 1000. As always, we recommend that you test all new tank mix combinations for compatibility. You should apply Biocat 1000 with enough water (10-20 gallons per acre) to get good coverage of the residue. Biocat 1000 requires some moisture in the residue to work effectively, so it should not be applied under severe drought conditions.

The per-acre cost of Biocat 1000 depends on the application rate. At the full retail price (\$90 per gallon), the per-acre cost is:

8 ounces per acre	--- \$5.63 per acre
10 ounces per acre	--- \$7.03 per acre
12 ounces per acre	--- \$8.44 per acre
14 ounces per acre	--- \$9.84 per acre
16 ounces per acre	--- \$11.26 per acre

The per-acre cost is lower if you buy in larger sizes (2.5 gallon jugs or 30 gallon drums) or during our Fall Discount Program (September 1 to October 31, 2007).

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

Address Service Requested

## **USE DRY SEED TREAT FOR WINTER WHEAT**

Our users who harvested their wheat during the past few months are smiling due to the high yields and strong prices they encountered this year. We also expect that they will continue to see high wheat prices for the coming year due to more weather concerns, declines in foreign production, and high prices for soybeans and other competing crops. If you plan to sow wheat, rye, or other cereal grains this fall, you should apply Chandler Dry Seed Treat to help the seedlings emerge faster and to protect against winter kill. For about \$2 to \$3 per acre (depending on your seeding rate), Dry Seed Treat can also help to increase the number of stools or tillers per crown, cut back on planting or seeding rates, reduce lodging, and generate yield increases of 5 to 7.5 bushels per acre in wheat and other small grains.

## **FALL DISCOUNT PROGRAM BEGINS SOON**

Our Fall Discount Program for most of the Chandler Crop Products starts September 1 and runs through the end of October, 2007. The full discount and retail price list is enclosed with the newsletter. Please note that the discounts are higher during the initial weeks of the program and decline during the later weeks. The regular retail prices for all products are back in effect after October 31, 2007. You must pay for the product within the stated discount period to qualify for that discount, and you can take delivery of the product when you place the order or request that we store it for later delivery. If your total order is \$800 or more, we ship the product freight-free. Otherwise, our standard UPS freight rates apply --- \$8 for each gallon jug, \$9 for each 15 pound Dry Seed bucket, and \$10 for each 2.5 gallon jug.

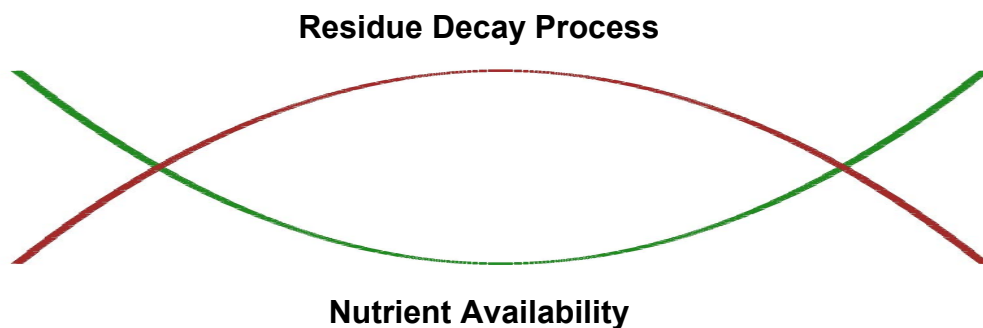
# Managing Continuous Corn Residue with Chandler Biocat 1000

## Corn Residue: Asset or Liability?

In recent years, farmers have had to deal with increasing amounts of corn residue, especially if they are using Bt corn hybrids with heavy stalks or if they have shifted to more continuous corn acres. Although we know that corn residue may be an asset in farming because it is an important source of humus and nutrients for the soil, we also know that excessive amounts of corn residue can tie up nutrients for the next crop. As well, large amounts of undecayed residue can hamper tillage and planting operations, reduce warming and drainage of the seedbed, contribute to chemical carryover problems, and harbor soil insects and disease. The purpose of this paper is to show how farmers can successfully manage the residue decay process when they are working with continuous corn, Bt corn hybrids, or other high residue situations.

## Why Does Undecayed Residue Tie Up Nutrients?

Carbon in the corn residue is the key reason for this asset versus liability question. The soil microorganisms that break down the residue convert about one-third of the carbon to humus that helps to build up the soil organic matter and structure, and the rest of the carbon is released as carbon dioxide. However, these microorganisms use the nitrogen and other soil nutrients as a food source while they convert the carbon, so these nutrients are tied up and unavailable to the plants during the decay process. After the decay process ends, the nitrogen used by the microorganisms becomes available to the next crop. As shown in the figure below, the availability of all soil nutrients (green line) decreases as the residue decay process (brown line) 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. Thus, the residue decay process should be started and ended as soon after harvest as possible in order to reduce nutrient tie-up and make more soil nutrients available for production of the next crop.



## Understanding the Carbon-Nitrogen Ratio

The time required to complete the residue decay process depends on the carbon-nitrogen ratio, which measures the amount of carbon present in the residue relative to the amount of nitrogen. The microorganisms driving the decay process work best if the carbon-nitrogen ratio of the residue is less than 30. As the ratio increases (more carbon relative to nitrogen), the decay process lasts longer and the nitrogen and other soil nutrients are tied up for a longer period of time. The carbon-nitrogen ratios for some common types of crop residue and yard waste are:

<b>Type of residue</b>	<b>C-N Ratio</b>	<b>Type of residue</b>	<b>C-N Ratio</b>
Grass clippings	10-25:1	Corn stalks	60-70:1
Red clover	20-30:1	Corn cobs	60-125:1
Tree leaves	40-80:1	Oat straw	50-100:1
Timothy hay	55-60:1	Wheat straw	100-150:1

Corn stalks and grain straw have high carbon-nitrogen ratios and require a longer time to decay. If the decay process is not completed before the next crop is planted, the undecayed residue may tie up valuable soil nutrients and hamper early growth of the next crop.

### **Can't We Simply Apply More Nitrogen to Solve the Problem?**

Fertilizer companies typically recommend heavy fall nitrogen applications to help decay residue by balancing the carbon-nitrogen ratio, and this has been a common practice in continuous corn farming for several years. However, agronomy studies recently conducted at the University of Wisconsin at Madison found that fall nitrogen applications did not significantly affect corn residue decay. Further, agronomists tell us that heavy nitrogen applications can reduce potassium uptake into the plant. Potassium is required for the stalks and other critical plant structures, and a potassium deficiency can lead to poor stalk quality and lodging. Finally, we all know that excessive nitrogen applications can leach into the ground water or surface water (rivers and streams) and contribute to long-term environmental problems.

### **What if the Crop Residue is Removed from the Field?**

Some farmers bale corn stalks or use other practices that remove the corn residue from the field, and there is evidence to show that this approach may help the next crop. For example, the old rule-of-thumb is that beans planted after corn silage may yield 5-10 bushels per acre more than beans planted after regular corn. The silage cutting operation removes the residue from the field, and the next bean crop can achieve higher yields because the soil nutrients are not tied up by undecayed residue. However, an acre of harvested corn may contain 8-10 tons of residue with up to 200 units of nitrogen, 74 units of phosphate, and 290 units of potash. Based on current fertilizer prices, these nutrients may be worth \$100 or more per acre. If the residue is removed from the field, these nutrients and the organic material (humus) are lost to the soil.

### **Use Chandler Biocat 1000 to Manage the Decay Process**

In conclusion, farmers must deal with more heavy corn residue than ever before, and the increasing amount of carbon per acre in this residue can tie up soil nutrients and cause other problems. Although some short-term relief to the excess residue problem may be achieved by applying more nitrogen to balance the carbon-nitrogen ratio or by simply hauling away the residue, these methods are both expensive and wasteful. The key way to generate as much economic value from this residue while avoiding the liabilities is to stimulate the soil microorganisms and accelerate the decay process. Chandler Biocat 1000 is a liquid enzyme product that contains micronutrients and other compounds specifically designed to accomplish this task. Biocat 1000 should be applied to the residue as soon after harvest as possible in order to complete the decay process before the next crop is planted. The product may be applied with conventional spray equipment, and it is compatible for tank mix combinations with most commonly used liquid fertilizer and pesticides. Please refer to the Biocat 1000 product brochure and other information posted at our website ([www.midwestbioman.com](http://www.midwestbioman.com)) for more details.

**2007**  
**SPECIAL FALL APPLICATION PROGRAM**  
**for CHANDLER CROP PRODUCTS**

**ORDER FORM**  
**MIDWEST BIO-TECH, INC.**

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

<b>Chandler Products</b>	<b>Retail</b>	<b>Oct. 16-31</b>	<b>Oct. 1-15</b>	<b>Sept. 16-30</b>	<b>Sept. 1-15</b>
15# Bkt Dry Seed Treat	150.00	144.00	140.00	135.00	132.00
2 to 5 Bkts - Per Bkt	145.00	139.00	135.00	131.00	128.00
6 or more Bkts - Per Bkt	140.00	134.00	130.00	126.00	123.00
(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
<b>Chandler Organic</b>					
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 Treat is priced per bucket --- **the rest of the products are priced per gallon**

- A – The early September and October discount periods end at midnight on September 15 and October 15, 2007
- 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 you
- 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

Name \_\_\_\_\_  
 (please print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_ - \_\_\_\_\_

<b>Qty.</b>	<b>Products</b>	<b>Unit</b>	<b>Price</b>
	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 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!**