

INTERNATIONAL AG LABS A BIOLOGICAL APPROACH TO AGRICULTURE

Newsletter October 2011

International Ag Labs



INSIDE THIS ISSUE

▪ IT PAY\$ TO DECOMPOSE	1
▪ PLOT & YIELD DATA	1
▪ SEED	3
▪ RESIDUE DECOMPOSITION	4
▪ IS YOUR CORN SHRINKING?	5
▪ SYMPTOMS OF GOSS' WILT	5
▪ IAL WAREHOUSE	6
▪ CORN RESIDUE	6
▪ ZHUME	8

YOU KNOW IT'S VALUABLE, NOW YOU CAN FIND OUT EXACTLY HOW VALUABLE IT IS BY SIMPLY INPUTTING A FEW NUMBERS.

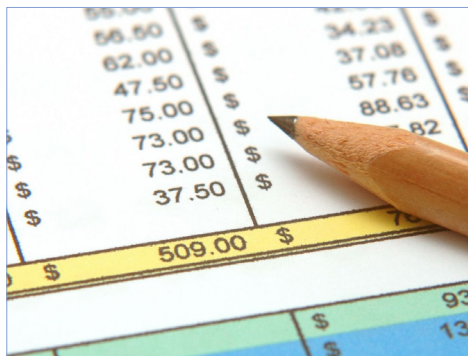
It Pay\$ to Decompose

BY JON C. FRANK

As fertilizer prices rise so does the NPK value of your corn and wheat stover left on the soil. The question is can you get the residue digested in time to help fertilize the next crop?

I believe the answer is Yes—if you help the process along. Since residue digestion is the result of microbial action it only makes sense to apply, feed, and stimulate these vitally important residue digesters. Bacteria breaks down crop residue and converts it to organic matter. Soil organic matter is a holding tank for plant nutrients including carbons, calcium, sulfur, and trace minerals along with NPK. Organic matter is like money in the bank when it comes to soil fertility. This is what residue needs to decompose into before it can be utilized by the next crop.

International Ag Labs has been promoting our fall residue program for 15 years. During this time our message has remained consistent; apply live bacteria specialized in microbial digestion, feed them with sugar and nitrogen, slow release the nitrogen by adding calcium and sulfur, then stimulate the bacteria by applying a catalyzing humate and



liquid B12. That is the essence of a successful residue program.

Making Money with Math

For the typical residue program, the breakeven point is right at 100 bushels per acre. What is interesting is that as yield increases so does your return on investment. Now for the math...

1. First you need to determine tons per acre of residue. With corn, the weight of the kernels (test weight) is equal to the weight of the stover on a dry matter.

Tons of Residue = (Bushels/Acre x Weight of Bushels x % of Dry matter) ÷ 2,000 lbs/ton

Plot and Yield Data

With one of the most perfect harvests almost behind us in southern MN—weather wise—International Ag Labs was anxious and excited to begin analyzing test plot data. IAL had three plots one comparing over a dozen conventional corn varieties as well as a corn and soybean plot each comparing traited varieties to conventional.

Yield results are in and will be released soon along with a financial analysis determining which delivered a better return on investment—traited or conventional. ■

The Fall Residue Program is really just a key to 'unlock' some of the stored up fertility in your residue.

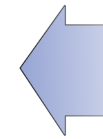


For Example, a corn yield of 180 bushels/acre at 15.5% moisture:

$$\text{Ton of Residue} = (180 \text{ bu/ac} \times 56 \text{ lbs} \times 0.845) \div 2,000 \text{ lbs/ton} = 4.26 \text{ Tons of Residue}$$

2. Next, you need to know the NPK value of one ton of corn residue. According to research by Iowa State University, the lbs/ton for NPK is 20, 7, and 33 respectively. Multiply these numbers by the total tonnage (4.26) and you get:

Nutrient	lbs/ton
N	85
P ₂ O ₅	30
K ₂ O	141



The lbs of NPK tied up in your residue that need to be unlocked

3. Then the cost of NPK per lb should be determined. In this example, prices are based off of local co-op prices. Calculating the cost/lb of actual NPK is a 2 step formula. Let's take N for example:

A. $2,000 \text{ lbs/ton} \times \% \text{ N} = \text{lbs of actual N}$

Ex: $2,000 \text{ lbs/ton} \times 0.46 = 920 \text{ lbs of actual n}$

	Analysis	\$/ton	\$/lb of actual
Urea	46-0-0	\$650	\$0.71
Map	11-52-0	\$740	\$0.71
Potash	0-0-60	\$650	\$0.54

B. $\text{Cost/ton} \div \text{lbs of actual N/ton} = \text{Cost/lb of actual N}$

Ex: $\$650 \div 920 \text{ lbs of actual N} = \0.71

This same formula applies to phosphate and potash values of Map and Potash.

4. Next, the value per pound is multiplied by the total pounds contained in the plant residue.

85 lbs N x \$0.71 = \$60.18
30 lbs P ₂ O ₅ x \$0.71 = \$21.21
141 lbs K ₂ O x \$0.54 = \$76.13
Total Value: \$157.52

On one acre which raised 180 bushels/acre, there is \$157.52 worth of NPK locked in the residue!

Lock and Key

The fall residue program is really just a key to 'unlock' some of the stored up fertility in your residue. Our best guess is that 50% of residue can be digested and used to grow the next crop if the residue program is applied in the fall with the right combination of ingredients. Below are the basic components that IAL feels must be supplied.

Basic Components	\$/acre
10 gal 28% or 32%	\$19.21
3 gal Thiosul	\$7.51
2 qt Live bacteria (as found in Z-Hume)	\$7.50
5 lbs Soluble carbohydrates to feed biology (Dextrose)	\$2.25
5 – 10 gal Water	
Application	\$8.00
Total:	\$44.47

If you would like to play around with this concept by inputting your own field, fertilizer prices, and custom digester formula go to our web-site:

www.aglabs.com/residue

It is my suggestion that the total gallons of liquid nitrogen from 28/32%, thiosul, and liquid calcium nitrate be at least 10 gallons. If less than this is applied, you may not have applied enough to do the job.

By dividing the total dollar value of the residue by 2 we arrive at 50% of nutrients that can be potentially 'unlocked' by following this residue program. While there is no guarantee of performance, field results suggest this is a realistic expectation. $\$157.52 \div 2 = \78.76

Value of Nutrients Ready for Next Crop

This value is compared to the total cost of the residue program to project the return on investment (ROI).

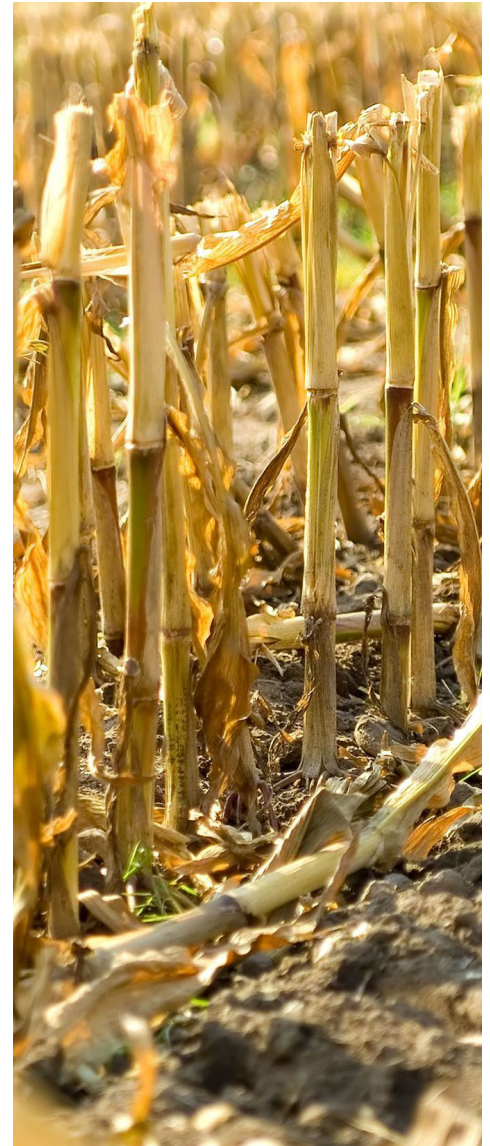
$$\text{Projected \% ROI} = \frac{\text{Projected Value of Unlocked Nutrients} - \text{Total Cost of Residue Program}}{\text{Total Cost of Residue Program}}$$

$$\text{Ex: } \frac{\$78.76 - \$44.47}{\$44.47} = 77\% \text{ ROI}$$

Benefits of Fall Residue Management

A major benefit of thorough residue decomposition is increased disease protection from vectors that find safe harbor in plant residue (such as disease causing fungal and bacterial spores). Another problem with undigested residue is that it sucks up a lot of N during the next growing season and may even serve as a yield drag. In fact, research at the University of Minnesota suggests undigested residue can account for a 27 bu/acre decline in production. Page 6 contains the full article that appeared in Corn and Soybean Digest. With fertilizer prices higher than a kite it makes more sense to me that corn residue is digested and nutrients unlocked rather than removed.

What are you thoughts and experiences with residue? Let me know at www.facebook.com/aglabs or email me at jon.frank@aglabs.com ■



Seed

International Ag Labs is proud to carry Dairyland, Renk, and Prairie Hybrids seeds. All three companies offer top of the line products with their own unique qualities.

PRAIRIE HYBRIDS

'The Non-GMO specialists' carry a range of top quality corn seed with a hybrid suitable for any soil type. This is a family owned and operated company based out of Deer Grove, IL—quality and yield are their top priority.



DAIRYLAND

Dairyland excels in many areas—high yielding conventional and traited corn,



silage corn, and alfalfa. This West Bend, WI based company has many varieties of corn with excellent disease tolerance and hard to beat with yields. They are also one of the few companies that offer quality conventional soybean seed.

RENK

Another family owned company out of Sun Prairie, WI which offers a versatile line up of hybrids across a vast range of maturities. With heavy hitters in yield in both conventional and traited corn, Renk also gains bragging rights with their silage corn and alfalfa seed.



For more information regarding seed, contact Jamie Jones at 507.235.6909.

Why is N so Important to Residue Decomposition?

BY JAMIE JONES

You've probably discovered that the two mainstays of International Ag Labs' fall residue management include some source of nitrogen (N) and Z-Hume. Z-Hume is important in that it contains a wide variety of microbes helping to increase the population of decomposing 'workers'. That makes sense, but why N?

A recent Farm Journal article 'Fields That Never Catch Up' written by Darrell Smith who interviewed Ken Ferrie, exposes the interaction between soil microbes, N, and potential yield reduction. Ken Ferrie, Farm Journal Field Agronomist, explains that soil microbes are necessary in the breakdown of carbon in crop residue. Most importantly, these microbes need a comfortable living condition and ample food supply in the form of N.

Where does the N come from? That's right, the soil. Where does the soil get it from? Crop residue and fall applications of N. Let's take fall applied anhydrous for example. When a grower works the ground and then applies anhydrous an abundant food source is created for soil microbes whose populations then explode. In order to feed this population, a large amount of N is immobilized as a food source. In other words, the soil microbes take up a large amount of the N from the anhydrous and immobilize it; therefore, it's no longer available to the plant. As spring rolls around and young corn plants begin to grow and N deficiencies appear. Ferrie says "you will never get ahead of demands using only a fall ammonia application and no surface application if there is a great deal of residue incorporated."

What exactly are soil microbes? The group of soil microorganisms responsible for carbon digestion include actinomycetes, fungi, and bacteria. Here is a breakdown of each group:

Actinomycetes—a unicellular organism that is somewhat of a mixture of both bacteria and fungi. The aroma of freshly tilled soil can be attributed to the by-product of actinomycetes. This microorganism is sensitive to pH but handle high temps and lack of moisture better than fungi and bacteria.

Fungi—if you've ever picked up a handful of soil and seen what looks like long white threads running through decaying plant tissue then you've seen soil fungi. Fungi are more tolerant of acidic soils than bacteria and actinomycetes but they do not tolerate high heat and drought conditions very well.

Bacteria—as a single-cell organism, bacteria tend to be moisture and pH sensitive. Ferrie states there are more than 20,000 species of bacteria in just a tablespoon of soil.

How can I Maximize Residue Decomposition? Keeping the microbes comfortable is key—minimize compaction, address pH issues, and fall broadcast N specifically for microbial use. Below is International Ag Labs' guideline to improving microbial activity and minimizing residue.

- 5-10 gal/acre 28% or 32%
- 3-5 gal/acre Thiosul
- 2 qt/acre Z-Hume
- 3 lbs/acre Dextrose (sugar)
- 10 gal/acre Water

If your operation includes no-till or minimum tillage, breaking down residue can be a daunting task but applying Z-Hume may accelerate this process. IAL recommends the fall broadcast below with thorough coverage in no-till/minimum tillage situations. It's also important to keep microbial populations up in the soil in order to break down root masses underground.

Another reason to include Z-Hume in fall residue management, as Ferrie points out, is that northern states have a much shorter decomposition period compared to the south. When

Z-HUME is loaded with soil bacteria aimed at improving populations necessary to breakdown residue and enhancing overall soil quality. Applied for residue management or tank mixed with starter at planting, Z-Hume is a simple and easy resource.

Looking for an Organic Option? STIMULATE is the organic certified version of Z-Hume proving the same quality results.

temperatures begin to dip down and soil goes into dormancy so does microbial activity. With such a small window to break down vast amounts of residue, Z-Hume can help get the job done quickly.

For further information on incorporating a fall residue management plan on your farm, call International Ag Labs at 507.235.6909.

Note: 28% and 32% are volatile products—what happens if it's not incorporated? Dextrose contains carbon and Thiosul contains sulfur. Together they help stabilize N minimizing volatility.

To read the full article 'Fields that Never Catch Up' featured in Farm Journal magazine go to www.agweb.com ■



Lesions on Husk



Salting Out

Symptoms of Goss' Wilt

- BROWN OR TAN LESIONS ON THE LEAVES
- BROWN OR TAN LESIONS ON THE HUSKS
- BLACK OR BROWN 'FRECKLING' WITHIN THE LESIONS
- 'THUMB PRINT' LESIONS ON THE STALK
- PURPLING OF STALK AND/OR HUSKS
- SALTING OUT
- MINIMIZED STALK INTEGRITY
- LOWERED TEST WEIGHT. ■

BY JAMIE JONES

Is Your Corn Shrinking?

Late July 2011 not only marked the beginning of a severe drought throughout the Midwest, but the beginning of the most intensive Goss' Wilt outbreak in history. This bacterial infection caused by *Clavibacter michiganense* subspecies *nebraskensis* has been confirmed in corn fields throughout Illinois, Iowa, Minnesota, and Nebraska.

Symptoms of Goss' Wilt may be misdiagnosed as drought stress because of the browning of the leaves. Typically some of the first signs of this bacterial infection are brown or tan lesions on the leaves and/or husks with black or brown 'freckling' within the lesion. It's important to note that Goss' Wilt infestations vary in symptoms and degrees of severity. Stalks will also show lesions which look like an inked 'thumb

print' and resemble hail damage.

As the disease progresses, the plant begins to salt out due to enzyme processes shutting down along with purpling of the stalk and husk caused by a hold up of potassium. Since the bacteria consumes the plant from the outside in, one of the last symptoms to appear is discoloration of pith. This is

.....

Did You Know?

Green Foxtail and Shattercane serve as a host to Goss' Bacterial Wilt.

caused by Manganese oxidizing out of the pith which results in the dark spotting of the vascular tissue (pith). An interesting point to note is that this symptom is not showing up

in all fields which may be due to lower Manganese levels in plants and soils.

Approaching Harvest

In some areas, such as southern Iowa, agronomist advised growers with severe infection to harvest once corn reached 30% moisture and dry it down to 13% moisture. The Goss' Wilt

bacteria will cross over the black layer and continue to reduce the sugars in the kernel—ultimately reducing test weight. This bacteria will continue to work in the bin if corn is not dried to 13%. Another reason for early harvest is to minimize stalk snapping since stalk integrity is reduced should there be any high winds.

Now What?

Once Goss' Wilt appears in a field it will be ever present but will express itself only when the conditions are right. Planting more tolerant varieties is one way to combat future infestations, but tillage practices and breaking down residue are probably the two most important components. Utilizing a combination of Z-Hume, 32% or 28%, and Thiosul will greatly assist in the breakdown of organic matter. By breaking down residue not only are nutrients released for future crops, but habitats for bacteria as well as many other fungal diseases are reduced. ■

Important: IAL Warehouse

Due to a warehouse fire that occurred Friday, October 14, 2011, International Ag Labs' production line will be down until further notice. At this time we are transitioning the warehouse to a different location. We sincerely apologize for any inconveniences caused but are working quickly to get back up and running.

Z-Hume and RL-37 are available. Please call to check for other product availability. Again, we apologize for any inconvenience and thank you in advance for your understanding.

Please note: This in no way affected the soil testing lab. Please continue to submit your soil, water, feed, tissue, compost, fertilizer, and manure for testing as normal. This also does not affect Fertilizer Brokerage. ■



Retain Corn Residue or Remove It? One Answer Does Not Fit All Conditions

Tue, 2011-02-15 11:14

By Edith Munro

Scientists and growers have amassed plenty of evidence on the benefits of retaining corn residue, but recent re-



search at the University of Minnesota (UMN) suggests there are circumstances where residue removal delivers agronomic benefits.

"The data we see indicate that residue removal may serve a viable agronomic advantage to the plant," says Aaron Sindelar, UMN research fellow, of his work on corn's response to residue removal and nitrogen (N) fertilization.

Sindelar's research looks at crop performance on heavy-textured, poorly drained southern Minnesota soils. By each measure – leaf height at the eight-leaf collar stage, grain yield, biomass yield and grain N content – his test fields performed better when residue was removed.

That generally held true regardless of the amount of N applied.

Sindelar and his university co-researchers, agronomists Jeff Coulter, John Lamb and Jeff Vetsch, also determined that residue removal produced better plant emergence

regardless of tillage method.

Retaining residues on the field can help preserve moisture and improve yields in where soil moisture can be a major limiting factor, he explains.

"For our (Minnesota) producers, soil temperature is often an issue under continuous corn due to the high amount of residue remaining in the field. When residue is removed, it allows the soil to warm faster, which stimulates emergence and early season growth," Sindelar says.

However, the research only looks at short-term consequences of reducing crop residues. "We're concerned that the long-term removal could reduce soil carbon levels and lead to a soil productivity decrease," he says.

If you harvest residue, consider applying manure in order to offset the carbon you remove through the residue, and consider reducing or eliminating tillage in order to reduce further carbon loss, he advises.

Sindelar plans one more year of field trials to produce three years of final data from two locations. His findings to date show:

- Leaf length at the eight-leaf collar stage (about four to six weeks into the growing season) was about 8 in. greater in plots where residue was removed.
- Corn yields were improved in the no-residue plots by about 27 bu./acre at all six levels of N fertilization.
- Biomass yields were higher in fields without residue, although the increase was not as great when more N was applied.
- Nitrogen levels were higher in grain harvested in the plots where residue was removed. Nitrogen levels in the grain indicate the overall quality of the grain.

Source URL: <http://cornandsoybeandigest.com/corn/retain-corn-residue-or-remove-it-one-answer-does-not-fit-all-conditions>

FERTILIZER BROKERAGE FOR ORGANIC & BIOLOGICAL FARMERS

WE OFFER THE BEST PRICES AVAILABLE TODAY

Call now for a delivered price
507-236-1954

FERTILIZERBROKERAGE.COM | AGLABS.COM

We Quote Delivered Prices

Fertilizer Brokerage is a service of International Ag Labs. If you're a crop producer trying to maximize your use of organic or commercial fertilizer, it's well worth your time to contact Fertilizer Brokerage. We have an extensive network of contacts and suppliers and a history of knowledge and expertise in the field of agriculture. That's why we look out for you and what's best for your operation by offering the best prices available in today's volatile markets.

We only recommend the best products on the market to meet your needs at the lowest prices. The nutrients and soil amendments we offer will meet the nutrient needs of the crop to be grown, while at the same time maximizing yields.

You can call to request quotes on different products. We quote delivered prices. If you don't see what you're looking for on our website, give us a call and we'll try to find it for you at the best price possible. ■

Prepare for success

Submit your soil samples to International Ag Labs this fall for testing and fertilizer recommendations. Create the foundation for a 2012 bin buster crop!

Catalog/Labels Update

We are in the process of updating our product catalog and labels. This will be made available to our customers in the near future.

Soil Testing
Making a better soil

INTERNATIONAL AG LABS
A BIOLOGICAL APPROACH TO AGRICULTURE

SOIL ANALYSIS REPORT

UNIT	DESIRED RATIO	DESIRED LEVEL
		30-40
HUMUS	%	40
NITRATES	lb./Acres	174
AMMONIA	lb./Acres	247
PHOSPHORUS	lb./Acres	3000
POTASSIUM	lb./Acres	629
CALCIUM	lb./Acres	<35
MAGNESIUM	ppm	200
SODIUM	ppm	25
ORGANIC MATTER	%	6-8
FORMAZAN	ppm	10-25
PH	ppm	0.8-2.5
COPPER	ppm	1-6
IRON	ppm	8-30
ZINC	ppm	0.1-1.2
MANGANESE	ppm	40
BORON	ppm	60
SULFUR	ppm	40
ORGANIC MATTER	%	6-8
FORMAZAN	ppm	10-25

Call now for free information on soil testing!
507-235-6909
Fax 507-235-9155 | www.aglabs.com | info@aglabs.com
800 W. Lake Ave. | P.O. Box 788 | Fairmont, MN 56031

INTERNATIONAL AG LABS
A BIOLOGICAL APPROACH TO AGRICULTURE

Bloomit®
2-18-0

Guaranteed Analysis

Total Nitrogen (N)	2%
2% Ammoniacal Nitrogen	
Available Phosphate (P ₂ O ₅)	18%
Manganese Nitrate	0.1%

Nutrients Derived From: Phosphoric Acid, Ammonium Hydroxide and Manganese Nitrate

Directions for Use:
Apply 2 quarts per acre with enough water to ensure complete coverage of foliage. A minimum of 20 gallons per acre is suggested. Bloomit shows plant response by increasing the amount of blossoms, consequently Bloomit should not be applied when desiring vegetative growth.

USE WITH CARE
KEEP OUT OF REACH OF CHILDREN
KEEP LID TIGHTLY CLOSED

Net Weight of 2.5 gal; 24.2 lbs

DISCLAIMER: There are no warranties of performance, expressed or implied. IAL has no control over the user's storage, handling or product application conditions. IAL shall not be liable for damages of any kind from the presence or use of this product.

800 W. Lake Ave.
P.O. Box 788
Fairmont MN 56031
507-235-6909
www.aglabs.com
www.ialagprays.com

INTERNATIONAL AG LABS
A BIOLOGICAL APPROACH TO AGRICULTURE

Advanced thinking in a changing

507-235-6909
507-235-9155
info@aglabs.com
www.aglabs.com

This newsletter is published by:

International Ag Labs
800 W. Lake Ave.
PO Box 788
Fairmont MN 56031

Phone: 507-235-6909
www.aglabs.com

©2011 – All rights reserved



Product Spotlight: Z-Hume

This liquid bacteria packed product is the perfect way to improve soil productivity. Z-Hume is most recognized for its residue decomposing abilities. By increasing the rate at which organic matter is broken down will allow crops to more quickly take advantage of the nutrients contained in the organic matter. Increasing the soils microbial population will continue to benefit the soil and the crop all season long by releasing plant available nutrients.

Z-Hume may be applied on cornstalks to minimize residue and improve decomposition (see Jon Franks article "It Pay\$ to Decompose"). This product has also shown benefit when applied in conjunction with starter fertilizers. Z-Hume may also be added to hog manure pits to potentially reduce crusting and improve microbial activity.

Z-HUME

SPRAY ADJUVANT

Guaranteed Analysis:
Fractured Natural Polyhydroxy Acids.....3%

Directions For Use:
Mix 1 to 2 quarts of Z-Hume in 20 to 50 gallons of water or fertilizer solution.

USE WITH CAUTION
KEEP OUT OF REACH OF CHILDREN
KEEP LID TIGHTLY CLOSED

Net Weight per Gallon; 8.7 lbs.

DISCLAIMER: There are no warranties of performance, expressed, or implied. IAL has no control over the user's storage, handling, or product application conditions. IAL shall not be liable for damages of any kind from the presence or use of this product.

800 W. Lake Ave.
P.O. Box 788
Fairmont MN 56031
507-235-6909
www.aglabs.com

INTERNATIONAL AG LABS
A BIOLOGICAL APPROACH TO AGRICULTURE

Residue Decomposition

5-10 gal 32% or 28%
2-4 gal Thiosul
2 qts Z-Hume
2 lbs Dextrose
10 gal water

Example Starter

5-10 gal 6-24-6
2 qts Z-Hume
1 pt RL-37
2 lbs Dextrose

Hog Pit

10 gal Z-Hume per 100,000 gal manure ■



STIMULATE is the OMRI certified version of Z-Hume providing the same quality results.