Emerging Technology Session
2014
National Alliance of Independent Crop Consultants

PRESENTATIONS
Sheraton New Orleans
New Orleans, Louisiana
Emerging Technology Session
2014
National Alliance of Independent Crop Consultants

Microbial Natural Products, Inc.

Sheraton New Orleans
New Orleans, Louisiana
Soil Health - The Key to Increasing Yields While Reducing Costs

Abstract

We have all read or heard about the positive effects of probiotics on human health. Researchers have found direct relationships between the type of microbes found in human digestive systems and obesity, Crohn's disease, depression etc. Plants have a stomach - it's the Soil. Plants, trees and turf do not have mechanical digestive systems with an acidic environment to break down their food and are therefore even more dependent on microbes to meet their nutritional demands. Common treatment programs for crops focus mainly on nutrients, water, weeds and disease control. These programs don't address the living or organic part of the soil. In fact many of these common practices (fungicides for example) are detrimental to the living component of the soil. This presentation includes examples of university studies and field results show the benefits of integrating biologicals into a grower's program include:

1. Higher Yields
2. Reduced fertilizer usage
3. Reduced chemical usage
4. Reduced irrigation usage
5. Shorter growing seasons
Product Background

The Quantum Growth Series are highly active microbial consortiums of naturally occurring microorganisms consisting of:

1. Photosynthetic, Vegetative, Spore-forming microorganisms, high quality organic peat humus extract, supporting growth factors, humin, folic, fulvic, humic acids and others.

2. Various blends and ratios as required to repair and support soil web functions to addressing soil and plant health.
The Consortium

- Bacillus amyloliquefaciens
- Bacillus subtilis
- Bacillus licheniformis
- Bacillus megaterium
- Bacillus circulans
- Bacillus pumilus
- Microbacterium sp.
- Rhodopseudomonas palustris
- Pseudomonas sp.

- Pseudomonas stutzeri
- Pseudomonas citronellois
- Brevibacillus sp.
- Micrococcus sp.
- Rhodococcus erythropolis
- Rhodospirillum rubrum
- Nitrobacter winogradsky
- Clostridium nitrophenolicum
- Family Actinomycetes
Bacterial Photosynthesis

Photosynthetic bacteria can harvest any radiant energy.

Bacterial Photosynthesis

\[ 2H_2 + CO_2 \xrightarrow{\text{Light}} (CH_2O) + H_2O \]

\[ 2H_2S + CO_2 \xrightarrow{\text{Light}} (CH_2O) + 2S + H_2O \]

- Bacteria also conduct photosynthesis to produce sugars.
- When we think of light, we think of just visible light. The term light means any radiant energy. Bacteria utilize the entire radiant energy spectrum, including light that is not visible to the human eye – i.e. radio waves, microwaves, etc...
- Photosynthetic bacteria contain carotenoids and several types of bacteriochlorophyll that can capture this energy.
Blueberry Production

Tests Results on the Use of Quantum Growth Products on 1 year Old Austin Rabbit Eye Blueberry Plants.

Plants on left - Growers Best Practice
Plants on right - Growers Best Practice plus Quantum Growth

Application Rates:
1st. 2% solution of 1% Quantum Light & 1% Quantum VSC
2nd. 5 days later a weekly 1% solution of Quantum Light + Quantum VSC

Note: 1% solution of 14-7-14 liquid time release fertilizer added to each application

Grower's comment: "Your Quantum Growth products worked equally well with all our varieties. "
2012 Green Pepper Study by Rutgers University  
October 24, 2012

SOIL ALLIANCE™ | Applied Field Research 2012

Quantum Growth

RUTGERS  
New Jersey Agricultural  
Experiment Station

CONFIDENTIAL

Crop ROI Calculation Tool

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Kilogram</th>
<th>Cartons</th>
<th>Dollars</th>
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<tbody>
<tr>
<td>Control Yield per Acre</td>
<td>6,349</td>
<td>500</td>
<td>$5,015</td>
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<tr>
<td>Test Yield per Acre</td>
<td>7,844</td>
<td>618</td>
<td>$6,196</td>
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<tr>
<td>Pounds per Unit</td>
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<tr>
<td>Average Price per Unit</td>
<td>0.79</td>
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<tr>
<td>Microbial Product</td>
<td>Quantum</td>
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<tr>
<td>Application Rate (Gallons per Acre)</td>
<td>1.00</td>
<td></td>
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<tr>
<td>Standard Fertilizer Expense per Acre</td>
<td>235.00</td>
<td></td>
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</tr>
<tr>
<td>Percent Reduction in Fertilization Program</td>
<td>23%</td>
<td></td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Results</th>
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<tbody>
<tr>
<td>Yield Increase per Acre in Kilograms</td>
<td>1,405.00</td>
<td></td>
<td></td>
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<tr>
<td>Percent Yield Increase per Acre</td>
<td>23.55%</td>
<td></td>
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<tr>
<td>Yield Revenue Increase per Acre</td>
<td>$2,180.99</td>
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<td></td>
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<tr>
<td>Microbial Expense per Acre</td>
<td>$40.00</td>
<td></td>
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<tr>
<td>Fertilization Savings per Acre</td>
<td>($54.05)</td>
<td></td>
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<tr>
<td>Net Change in Fertilization Expense per Acre</td>
<td>($14.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Gain/ (Loss) per Acre</td>
<td>$1,345.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROI Multiplier for Microbial Expense</td>
<td>29.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Explanations
Cartons contain 1 1/9 Bushels, weighing 35 pounds.
Price of $10.03 per carton is the average price for all sizes of green peppers in the month of October 2012 at the Philadelphia shipping terminal.
Percent Yield Increase per Acre 23.55%
ROI Multiplier for Microbial Expense 29.88

Bell Pepper Trial--Quantum

Test Yield per Acre  618
Control Yield per Acre  500

Bell Pepper Trial--Quantum

Test Yield per Acre  56,196
Control Yield per Acre  55,015
Emerging Technology Session
2014
National Alliance of Independent Crop Consultants

United Soybean Board
Sheraton New Orleans
New Orleans, Louisiana
Abstract

Five commodity organizations, six major herbicide providers and universities from 15 states have created a new industry-wide partnership to help farmers manage herbicide resistant weeds, and we need the support of independent crop consultants. While there are new and emerging herbicides, the industry wide message is that farmers need to know their weeds, know the best practices for their fields, and understand herbicides. The program encourages farmers to take action against existing weeds and be proactive to keep resistant weeds out of their fields. The session will showcase several new print and digital resources to help farmers manage resistant weeds.

Contact: Eileen Jensen
914 Spruce Street
St. Louis, MO 63102
314-746-1908

United Soybean Board
Sheraton New Orleans
New Orleans, Louisiana
I WILL REDUCE THE WEED SEEDS IN MY SOIL.

I will take action against herbicide resistant weeds.

I will kill my weeds. I will forget their strengths and exploit their weaknesses.

Erasers don't eliminate chance.

I will remove them out and take them down before they get a seed.

Because fewer seeds today means fewer weeds tomorrow.

Now is the time to take action against herbicide resistant weeds. Visit TakeActiononWeeds.com to learn how you can prevent herbicide resistant weeds from spreading.

Take Action

HERBICIDE RESISTANCE MANAGEMENT

I WILL TAKE ACTION AGAINST HERBICIDE RESISTANT WEEDS.

I will know my weeds. When they grow. When they pull. And I will stop them before they get a seed.

I will take action in the field and no one will let me give up. This is the only way to keep weeds.

I will take action with careful herbicide management and use multiple herbicide sites of action because every action counts.

I will take action because it's my bottom line. If not this year or the next. It's about the long term.

I will take action. This time. For all time.

Now is the time to take action against herbicide resistant weeds. Visit TakeActiononWeeds.com to learn how you can prevent herbicide resistant weeds from spreading.

Our Soy Checkoff
Progress Powered by U.S. Farmers
Herbicide Classification Chart

Tops Weeds / Known Resistance Poster

Copies Available
Palmer Amaranth Distribution and Biology

- Native to the southwestern United States, Palmer amaranth (aka Palmer pigweed) has become a devastating weed problem in the South and has recently spread to the upper Midwest.
- Many fields in the eastern Soybean Belt where Palmer amaranth has been found receive an application of manure from dairy cows that were fed cotton byproducts as a feed supplement.
- Palmer amaranth is the most competitive and aggressive pigweed species. Season-long competition by Palmer amaranth at 2.5 plants per foot of row can reduce soybean yields by as much as 79 percent.
- Palmer amaranth emerges later than many summer annual weeds and continues to emerge throughout the growing season. This extended emergence pattern makes it difficult for pre-emergence and non-residual post-emergence herbicides to control late-emerging plants.
- The high relative growth rate of Palmer amaranth makes control with post-emergence herbicides difficult. In late-summer fields, Palmer amaranth has been documented to grow as much as 2.5 inches per day. In Michigan, Palmer amaranth grows 4 inches in less than five days during the post-emergence herbicide applications.
- Prolific seed production has perpetuated the establishment and spread of Palmer amaranth. A single female Palmer amaranth can produce approximately 600,000 seeds per plant.
- Compared with many other summer annual weeds, Palmer amaranth seed remains viable in the soil seedbank after six years. However, the sheer number of seeds produced by one female plant makes the eradication of Palmer amaranth difficult once it is established.

Genetic Diversity and Herbicide Resistance in Palmer Amaranth

- Palmer amaranth is dioecious, meaning its male and female flowers grow on separate plants. This increases the genetic diversity of this species and facilitates the spread of herbicide resistance and other adaptive traits that improve the survival of Palmer amaranth in agronomic systems.
- Since the late 1980s, Palmer amaranth has evolved resistance to five different herbicide sites of action.

Herbicide Resistance in Common Lambsquarters

- Take Action.

Common Lambsquarters Distribution and Biology

- Common lambsquarters is one of the most prevalent weed species found in the crop. Lambsquarters are mainly found in the Central Plains and Midwest regions.
- The common lambsquarters plant is a biennial and produces a seed each year, which can survive in the soil seedbank for up to four years.
- Common lambsquarters can reach a height of 1 meter and grow in a wide range of soil types.
- Common lambsquarters is a weed that requires attention in crop rotations and weed management practices.

Common Lambsquarters Management in Soybeans

- Common lambsquarters can be controlled with pre-emergence herbicides such as pendimethalin or atrazine in the fall or winter, before planting.
- In-season herbicides such as sulfonylurea (SUI) or pyridate-based herbicides can be used to control common lambsquarters when it is emerging.
- Use of herbicides with multiple modes of action increases the chances of controlling common lambsquarters.

Our Soy Checkoff Progress Powered by U.S. Farmers
Winfield Solutions, LLC. introduces MasterLock®, the newest member of the InterLock® family.

Abstract

MasterLock® gets more spray farther down into the canopy where it stays put for superior performance. Masterlock® is a premixture of InterLock® and DropTight™ technologies. It maximizes deposition, canopy penetration and minimizes drift. MasterLock® maximizes the performance of insecticides, fungicides and herbicides when ground or aerial applied. It is convenient, easy to mix, low use rate, it maintains the spray pattern and can be used with all spray tips. Suggested rates are 4 fl oz/a by air and 6.4 fl oz by ground.

Winfield Solutions, LLC.

Sheraton New Orleans
New Orleans, Louisiana
MasterLock® - Newest member of InterLock® family

- Gets more spray into the canopy and stays put for superior performance
  - InterLock® + DropTight™ Technologies
  - Maximize coverage where pests live
  - Maximizes fungicide and insecticide performance
  - Excellent aerial application characteristics
  - Low rate
  - Does not contribute to arrested ear
MasterLock® puts more spray on target deep in the canopy

Without MasterLock®
- Top: 60% Coverage
- 5 foot: 7% Coverage
- 1 foot: 1% Coverage

MasterLock®
- Top: 38% Coverage
- 5 foot: 22% Coverage
- 1 foot: 15% Coverage

20" rows; tasseled corn; 20 GPA; flat fan 8003; south wind 4-8 mph; water sensitive paper
Superior coverage yields superior control

Without MasterLock®

MasterLock® with InterLock® Technology
**MasterLock® increases control**

**Effect of treatment on # of Cercospora infected leaves in soybeans**

<table>
<thead>
<tr>
<th></th>
<th>Day of Application</th>
<th>7 Days After Application</th>
<th>14 Days After Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated Check</td>
<td>8.5</td>
<td>12.25</td>
<td>22.75</td>
</tr>
<tr>
<td>Priaxor® (4 oz.)</td>
<td>8.5</td>
<td>5.5</td>
<td>3.25</td>
</tr>
<tr>
<td>Priaxor® (4 oz.) + MasterLock® (6.4 oz.)</td>
<td>8.75</td>
<td>2.5</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Conducted by Ronnie Phillips (Phillips Ag Consultant/Research); Robertson Co., TX; Date_ (6/30/12) @ 8:30 am

Spray Volume (15 gpa); nozzle_ Flat Fan 11015; (25 psi)
Temperature (77 °F); Humidity (92 %); Wind (calm); Cloud (0 %)

© 2012 Winfield Solutions, LLC
MasterLock® use information

- **Rates**
  - Optimum performance at 6.4 fl. oz./A by ground
  - Optimum performance at 1% v/v by air
    - Not less than 4 oz./A by air

- **Mixing**
  - Add last to the tank
  - Do not premix with other undiluted products

- **Packaging**
  - 2x2.5 gallon jugs
  - 275 gallon mini-bulk
Emerging Technology Session
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XSInc.
Sheraton New Orleans
New Orleans, Louisiana
XSInc – Cracking the Code on Yield Monitor Data
By Becky Horn, Director of Marketing, XSInc

Abstract

Practically everybody’s got yield monitor data. They can’t help it. The newer harvesters have the monitors built right in. But what’s everybody doing with that data? New Sustaining Member XSInc, headquartered in North Carolina’s Research Triangle Park, is answering that question. Big data is their specialty. Since 1998 they’ve been serving the ag industry by collecting, cleaning, integrating, analyzing, and creating informative reports and maps from all kinds of ag data. They’re the guys that make sense of it all.

Growers want to know that a new seed, chemical, or technique truly works better on their fields. The challenge with on-farm trials is that there is natural variability in every field. The advanced statistical analysis required to account for this variability has been previously confined to academic settings. The newest offering from XSInc, AgVeritas™, is yield analysis software that brings this advanced analysis to your fingertips by revealing in-field variability and its impact on yield along with other measurable factors, like nutrient levels and soil types. This helps consultants determine which management practices will perform best in their growers’ fields, and give them the most return for their product investment. For more information on XSInc, please contact Becky Horn, Director of Marketing, bhorn@xsinc.com, 919-379-3539, www.xsinc.com

XSInc.

Sheraton New Orleans
New Orleans, Louisiana
AgVeritas™

Know the Truth.

Presented by:

XSIInc™

Bill Barton, Principal
bbarton@xsinc.com
Yield maps are interesting but…

What does this yield map tell me?

Did that fertilizer really work or did something else affect my yield in that area?

That side of the field always yields better. Why?

Is the investment really worth it?
This is not a yield map

- Unexplained areas of high or low yielding areas AFTER accounting for all known data
- Examples: deer damage, equipment malfunction, former turkey farm, etc.
Any number of variables...

Model’s Explanatory Power: 53%

- Importance relative to other variables in the analysis
  - Soil Types
  - Spatial Effects
  - PH 1/1/2012
  - OM 1/1/2012
  - Zinc 1/1/2012
  - Harvest 9/18/2012
  - Planting 04/24/2012
  - Seeding Rate 04/24/2012

- Very little or no explanatory power
  - PHOSPHORUS 1/1/2012
  - POTASSIUM 1/1/2012
In future years with conditions and management practices similar to this year, the map shows areas where it is most likely to be profitable to make this investment.

- Not likely to recover your investment
  Estimated less than 2.50 bu/ac increase

- Recover the cost only
  Estimated 2.50 - 3.75 bu/ac increase

- 50-100% return
  Estimated 3.75 - 5.00 bu/ac increase

- 100-200% return
  Estimated 5.00 - 7.50 bu/ac increase

- More than 200% return
  Estimated over 7.50 bu/ac increase

- Low confidence

- Not enough information
Emerging Technology Session
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National Alliance of Independent Crop Consultants

Pioneer
Sheraton New Orleans
New Orleans, Louisiana
Abstract

Growers across the country have planted more Pioneer® brand soybeans on their acres than any other brand for over 20 years running. There are a lot of reasons that go into becoming the number one planted brand. It starts by having consistent, top quality varieties supported by a dedicated, knowledgeable sales force.

Welcome to the next generation: T Series soybeans from DuPont Pioneer, packed with the next generation of yield performance as well as agronomic and defensive traits that are tailored to grower’s fields. It’s the total package growers are looking for to make the most from every acre.

Pioneer

Sheraton New Orleans
New Orleans, Louisiana
Pioneer® Brand T Series Soybeans

January 2014
“T Series” Soybean Introduction in 2014

**T Series**
It’s the next level of performance beyond just the product.

**Technology**
The flexibility to deliver higher yields through an expanded suite of elite genetics, traits and technologies

**Tested**
Global resources delivering results through local research, product testing and agronomy expertise

**Trusted**
Sales Professionals working with growers to develop acre-by-acre solutions
To add pre-formatted bullets please use the Increase/Decrease Indent buttons found in the Top-PowerPoint menu.
Expanded Soybean Seed Options

- **Products, Traits, Technologies**: expanding range of seed products, traits & technologies offered to growers.
- **Flexibility**: flexibility to create stacked trait combinations of genetics & traits from DuPont Pioneer & other companies to deliver products to help growers elevate their yields.

- 80 Pioneer® brand T Series products in the current North America portfolio.
- T Series include products with:
  - Herbicide Tolerance Traits
    - Roundup Ready®
    - Genuity® Roundup Ready 2 Yield®
    - Liberty Link®
    - DuPont™ STS® herbicide tolerance
  - Pioneer® brand Plenish® high oleic trait.
  - Key traits like SCN and Phytophthora resistance

Liberty® and LibertyLink® are trademarks of Bayer. DuPont™ and STS® are trademarks or registered trademarks of DuPont or its affiliates.

Genuity® is a registered trademark used under license from Monsanto Company. Roundup Ready 2 Yield® is a registered trademark of Monsanto Technology LLC used under license. The DuPont Oval Logo is a registered trademark of DuPont. PIONEER® brand products are provided subject to the terms and conditions of purchase which are part of the labeling and purchase documents.
Project Trends (NE, KS, western MO)

- 308 entries captured data
- Most common row spacing was 30”
- Average Seeding Rate was 175,000
- Average Planting Date was May 16th
  - Earliest = April 28th; Latest = June 16th
- Average yield: 76.5 bu/ac
  - Highest = 99.6 bu/ac
- 95% used Pioneer Proprietary Seed Treatment (PPST)
- Tillage
  - No-till: 49.2% of entries and a 73.2 bu/A avg.
  - Ridge-till: 24% of entries and a 81.9 bu/A avg.
  - Conventional: 13% of entries and a 76.9 bu/A avg.
  - Minimum-till: 7.4% of entries and a 77.25 bu/A avg.
  - Strip-till: 6% of entries and a 81.7 bu/A avg.
Emerging Technology Session
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Ag Leader
Sheraton New Orleans
New Orleans, Louisiana
Abstract

As information becomes more critical to decision-making and profitability, AgFiniti®, Ag Leader's NEW cloud-based platform, becomes the hub of your operation. Data from the field becomes information that can be accessed instantly from anywhere. Guidance lines, prescriptions, as-applied maps and other data files can be sent and received wirelessly. Files can be accessed from any device’s web browser or by using your SMS Software, and shared with trusted advisors such as crop consultants or farm managers. Field activities can be managed and monitored from your home office. Field displays accessed remotely. Connect your technology. Your partners. Your operation. Your way.

Ag Leader

Sheraton New Orleans
New Orleans, Louisiana
AgFiniti
Ag Leader’s Cloud-based Platform

NAICC Emerging Technology Session
New Orleans, LA
Luke James
Hardware Components

“mobile hotspot”

Tractor Cab

Ag Leader Integra®/Versa display

Ag Leader USB WiFi Adapter

Cell Tower
**File Sharing**

### My Files

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<thead>
<tr>
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<th>Date</th>
<th>Size</th>
<th>Actions</th>
<th>Shared with</th>
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<tr>
<td>ExampleFile1.agdata</td>
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<td>5 MB</td>
<td>Fewer Details</td>
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<td>ExampleFile2.agdata</td>
<td>4/8/2013 5:04 PM</td>
<td>5 MB</td>
<td>More Details</td>
<td>Tom Jones</td>
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<td>ExampleFile3.agdata</td>
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<td>5 MB</td>
<td>More Details</td>
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<tr>
<td>ExampleFile4.agdata</td>
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<td>5 MB</td>
<td>More Details</td>
<td></td>
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<tr>
<td>ExampleFile5.agdata</td>
<td>4/8/2013 5:02 PM</td>
<td>5 MB</td>
<td>More Details</td>
<td>Multiple</td>
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Files 1 – 5 of 30 [view more...](#)

### Shared Files

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<th>Size</th>
<th>Actions</th>
<th>Shared with</th>
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<tbody>
<tr>
<td>4/7/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than a week</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**500MB total data used of 2GB data limit**
Remote Support

Remote Support

View Display

Ag Leader Integra (201122144)  Nickname: Lukes tractor  Firmware: 5.2.9

Devices  Quality -

Cancel Connection

Nudge: 30.0 in
Total: 0.0 in
Pass: 1 R

Pass: 1 R

1.31 ac

5.0 mph

Reset
A → B

Manual Connect
Online Soil Sample Submission with FSA Maps and Field Borders

Abstract
AGVISE Laboratories has developed an Online Sample Submission program which eliminates the paper work and mistakes associated with providing required information for testing soil samples. Having the sample information submitted online also allows the FSA map, with the field border, to be linked to the sample report. Having the FSA map and field border on the soil sample report builds grower confidence in the services he is receiving. Online sample submission will allow future links of soil test data with crop consultants and other customers wanting access to their data.

If you have any questions on this emerging technologies topic, please call John Lee at 701-587-6010

AGVISE
Sheraton New Orleans
New Orleans, Louisiana
Online Soil Sample Submission
Eliminates time consuming, error riddled, hand written paper work
Grower and Field information are selected from the database.

Submit Grid/Zone Sample

Submitter Information
- Account #: LE0002
- Name: JOHN LEE
- Address: 698 EVERGREEN DR.
- City: GRAND FORKS
- State: North Dakota
- Zip: 58201

Grower Information
- Grower: John Grower
- Name: John Grower
- Address: 1234 Big Crops Avenue
- City: Green city
- State: North Dakota
- Zip: 58201
- Account #: 
- Sampler: 

Field Information
- Field: Grant Field
- Field ID: Grant Field
- Field Name: down by the river
- County: Grand Forks
- Range: 150N 53W
- Township: Pleasant view
- Section: 33
- Quarter: NW
- Total Acres: 147.0
information on previous crop, 3 crop choices, yield goals and sample depth are automatically filled in from database.
Soil Sample Order Form (with FSA Map and field border)

Submitter Information
Name: JOHN LEE
Address: 698 EVERGREEN DR.
City: GRAND FORKS
State: ND
Zip: 58201
Account Number: LE0002
Submitted: 12/20/2013 8:32:36 AM

Grower Information
Name: John Grower
Address: 1234
Big Crops Avenue
City: Green city
State: ND
Zip: 58201
Account Number: LE0002
Sampler:
Sample Date:

Field Information
Field ID: Grant Field
Field Name: down by the river
County: Grand Forks
Range: 150N 53W
Township: Pleasant view
Section: 33
Quarter: NW
Total Acres: 147.0
Year Sampled:

Crop Information

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>Manure Applied</th>
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</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>No</td>
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<table>
<thead>
<tr>
<th>Crop Selection</th>
<th>Yield Goal</th>
<th>P &amp; K Application</th>
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</thead>
<tbody>
<tr>
<td>1st Corn-Grain</td>
<td>160</td>
<td>Broadcast</td>
</tr>
<tr>
<td>2nd Corn-Grain</td>
<td>180</td>
<td>Broadcast</td>
</tr>
<tr>
<td>3rd Corn-Grain</td>
<td>200</td>
<td>Broadcast</td>
</tr>
</tbody>
</table>

Bar-coded Reference number
Stickers printed for placing
On each soil sample bag
Soil Test Results Posted to Web site (with FSA Map)

Online Submission of sample information (no paper or mistakes)
Bar-coded Reference number Stickers on sample bags for tracking from field through lab testing
FSA Map for sampler to use in field
FSA Map (with field border) on soil report creates professional report for Farmer

Almost 1 million samples submitted online in last 2 years!
Rodney M. Bennett, VP-Operations
JRF America

Abstract

With the expanded emphasis on metabolite identification and additional review of existing active ingredients (a.i.’s), a new and more extensive evaluation of both parent and metabolite identification and pathway elucidation is being sought by global regulatory authorities. Some of the new challenges and some added techniques will be discussed in a concise outline. For NAICC members, the metabolism and environmental fate studies typically have been on the fringe of studies they perform. These new challenges will present new opportunities for field researchers in the future.

JRF America

Sheraton New Orleans
New Orleans, Louisiana
New Metabolism and Environmental Fate Challenges

National Alliance of Independence Crop Consultants (NAICCC) Meeting 2014
Rodney M. Bennett, JRF America
Guidelines

• USEPA OCSSPP Guideline 860.1300 Nature of the Residue – Plants, Livestock [August 1996]

• Aerobic and Anaerobic Soil and Sediment Metabolism Studies

[USEPA/OECD Guidelines Include: Soil Metabolism (OECD 307); Sediment Metabolism (OECD 308)]
Challenges

• New questions for metabolite identification
  - Older studies did not identify sufficiently
  - Misidentification [adducts, conjugates, etc.]
  - Interest in <5% and <1%

• Simultaneous HPLC/UV/MS-MS evaluations

• Field cooperators with Radiation Licenses and Capabilities [Associated Costs Including Disposal]
Opportunities

• Increased Demand
• Support From Sponsors and Contract Labs
• Equipment - Liquid Scintillation Counter for Field Groups
• Expansion into New [or Forgotten] Areas
• Food For Thought – THANK YOU!
Emerging Technology Session
2014
National Alliance of Independent Crop Consultants

EPL Bio Analytical Services
Sheraton New Orleans
New Orleans, Louisiana
Ultra Sensitive Rapid Detection of Aminopyralid in Compost Using LC-MS/MS

EPL Bio Analytical, by Sara Bendler

Abstract

A selective method has been validated for the identification and quantitation of aminopyralid in compost. Aminopyralid is a selective auxinic herbicide used for broadleaf weed control in grasslands and pasture areas that has been shown to persist in horse manure and manure containing compost. Traditional bioassays used to evaluate compost can take several weeks and are not quantitative or selective for aminopyralid. This liquid chromatography tandem mass spectrometry (LC MS/MS) methodology uses an AB SCIEX 6500 mass spectrometer and offers increased selectivity, a lower detection limit of 1.0 ppb and reduced turn-around time when compared with traditional bioassays.

EPL Bio Analytical Services

Sheraton New Orleans
New Orleans, Louisiana
EPL Bio Analytical Services

Excellence, Passion and Leadership in Agriculture
Aminopyralid in Compost

An investigation of clopyralid and aminopyralid in commercial composting systems

A review of existing research on the occurrence, fate and management of residual risks from the herbicides clopyralid and aminopyralid during IAG 100 green waste composting processes and subsequent application of composts to susceptible agricultural crops.
Determination of Aminopyralid, Clopyralid and Picloram in Compost and Related Matrices by LC-MS/MS

**Extraction Summary**

- Extraction with 0.1 N NaOH
- Acidification and heat used to hydrolyze acid labile conjugates
- SPE Clean-Up
  - Phenomenex Strata-X (60 mg/3 mL)
  - Waters Oasis MAX (30 mg/3 mL)
- Internal Standard Additions and Derivatization
- Reconstitution in 50:50 DI Water: ACN with 0.1% Formic Acid

Method developed by Dow AgroSciences, LLC
Aminopyralid by LC-MS/MS (ESI⁺)

**Agilent 1290 LC AB SCIEX 6500 MS**

Kinetex XB-C18 Analytical Column (2.1 x 100 mm, 2.6 µm)

Mobile Phase A: Deionized Water with 0.1% Formic Acid

Mobile Phase B: ACN with 0.1% Formic Acid

20 µL injection volume

[Graph showing chromatogram with peaks labeled as Control Soil Sample and 10x LOQ Fortification (10 ng/g).]
Contact EPL!

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DuPont
Sheraton New Orleans
New Orleans, Louisiana
Prevathon®: 2013 Field Research Observations and Update

Abstract

In 2013, DuPont™ Prevathon® insect control was broadly evaluated on several crops and key pests, along with its fit in IPM programs. Sunflower head moth larvae control timings were evaluated in sunflower field trials from south Texas to the northern plains. Properly timed applications of Prevathon® improved sunflower seed set and kernel weight, and reduced the incidence of Rhizopus head rot. Based on field observations, Prevathon® did not cause spider mites or aphid population increases in these trials. In commercial food corn applications, a Prevathon® two treatment earworm program consistently held chips and cracked kernels under dockage guidelines. Prevathon® provided consistent residual control of alfalfa foliar feeding by Beet armyworm and alfalfa looper. The Prevathon® label will continue to be revised and updated as new information is documented.

DuPont

Sheraton New Orleans
New Orleans, Louisiana
DuPont™ Prevathon® insect control
2013 Experiences and Findings

Tom Koranek, Area Sales Manager

January 30, 2014
Sunflower Moth Larvae Counts

McCook, TX
Prolonged Blooming Period (~40 Days)

Application Dates:
April 19, 2013 & May 10, 2013
Key Learnings – Sunflower Trial

- Triumph Seed Production Fields (Lubbock, TX)
  - In 2012, seed set was less than 70% when four applications of synthetic pyrethroids were used.
  - Seed set in past years ranged from 75 to 80%.
  - In 2013, excellent sunflower head larvae control from Prevathon® applications made 4 days before and up to 2 days after 1% bloom of female plants.
  - In 2013, under similar moth and egg pressure, seed set averaged over 90% with Prevathon®, an increase of 10% to 15% seed set.
Additional Benefits

• Delivers long-lasting residual control of key worm pests of Canola, protecting Canola yield and improving quality.

• Improved application flexibility

• Excellent crop protection – starts working right away by stopping insect feeding and keeps working for 14 to 21 days* minimizing and reducing the number of potential treatments.

• Provides a very short reentry interval (4 hour REI), an excellent worker protection standard profile and minimal PPE requirement

• The mode of action of Prevathon® helps break the insect resistance cycles that result from repeated use of current products.

*Untreated plant material may not be fully protected as a result of plant growth. During the period of head expansion, sequential applications may be necessary.
New and Additional Registrations

- Cereals – November 2013
- Sorghum – November 2013
- Range and Pasture – grasshopper*, armyworm
- Seed Corn – lepidopteran pests
- Corn (White/Starch/Field) – lepidopteran pests
- Cotton (GMO & Conventional)
- Soybeans - lepidopteran pests

Thank You for Your Attention

Questions?

*This Prevathon® recommendation is permitted under FIFRA section 2(ee) for control of grasshopper nymphs and suppression of grasshopper adults in grass forage fodder and hay (rangeland & pasture grass) in in that states of Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, Oklahoma, Texas, Utah and Wyoming. The 2(ee) expiration date is 12/31/2013.
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Spectrum Technologies, Inc.

Sheraton New Orleans
New Orleans, Louisiana
Abstract

Spectrum Technologies’ WaterScout® SMEC 300 soil moisture sensor measures volumetric water content, soil electrical conductivity, and soil temperature, all via the same sensor, offering a cost-efficient solution compared to individual sensors. By monitoring the condition of the water between the soil particles across these three facets, the SMEC 300 sensor can be used as a proxy for nutrients in soil solutions to help make decisions regarding fertilization and irrigation. The sensor can also serve to warn growers of dangerous situations where soil salinity is an issue or where moisture and temperature conditions are conducive to the propagation of soil-borne diseases.

Spectrum Technologies, Inc.
Sheraton New Orleans
New Orleans, Louisiana
Emerging Sensor Technology for Soil Moisture, Temperature, and EC

Speaker: Mike Thurow,
Spectrum Technologies, Inc.
The Importance of Water

• Plant tissue is ~80% water
  – Too much
    • No oxygen in soil
    • Soils susceptible to compaction
    • Reduced microbial activity
    • Movement of nutrients out of root zone
    • Disease susceptibility increases
  – Too little
    • Less transpiration
    • Reduced photosynthesis
    • Reduced nutrient uptake
The Dangers of Soil Salinity

- Arid regions have the highest risk of salt build-up in the root zone due to:
  - Irrigation with low-quality saline water
  - Insufficient leaching through rainfall
- Soil salinity indicators:
  - White crust/crystals on dry soil surface
  - Patches of reduced growth or yield in areas
  - Tip burning of leaves, followed by yellowing and bronzing
  - Friable or “puffy” soil structure in low-lying areas when dry
  - Appearance of stunted plants
    - Reduced growth rate
    - Shortened leaves
Spectrum’s SMEC 300 sensor collects data on 3 different measurement inputs:

- Volumetric Water Content (VMC) %
  - Two electrodes function as a capacitor
  - Response signal is proportional to dielectric permittivity which is function of VWC
  - Sensitive to moisture within 3 mm field of influence
- Temperature
- Electrical Conductivity (EC)
  - Carbon Ink Electrodes are spaced with maximum surface area between for greater reliability
  - Conductivity increases with higher concentration of salts

Cost efficient compared to purchasing multiple sensors

Can be used with WatchDog dataloggers or Mini/Weather Station for analysis over time
Installation and Applications

• Easy installation
  – Surface installation
  – Deep installation with PVC pipe
  – One to four sensors should be installed to “bracket” the root zone
  – Good soil to sensor contact is crucial

• Applications
  – Can serve to warn growers of dangerous situations where soil salinity is an issue for more informed irrigation decisions
  – Can be used as a proxy for nutrients in hydroponics situations and greenhouse soil solutions
  – Can provide relative measurements of total nutrients in mineral soils for better row crop and vegetable crop fertilization timing
  – Can identify where moisture and temperature conditions are conducive to the propagation of soil-borne diseases
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Bayer CropScience
Sheraton New Orleans
New Orleans, Louisiana
DiFlexx: A New Broadleaf Herbicide from Bayer CropScience.

Jim Bloomberg, David Lamore and Jeff Springsteen, Bayer CropScience, RTP, NC.

Abstract

DiFlexx Herbicide is a new premixture of dicamba plus cyprosulfamide under developed by Bayer Cropscience for utility in the corn and fallow markets. Cyprosulfamide is a proprietary safener from Bayer which provides both foliar and soil safening properties. DiFlexx will offer both pre-emergence and post-emergence broadleaf weed control (including glyphosate-resistant broadleaf weeds) along with improved crop safety as compared with other dicamba formulations. DiFlexx can be tankmixed with additional herbicides to provide broad spectrum weed control. DiFlexx will be available for market introduction in 2015.

Bayer CropScience

Sheraton New Orleans
New Orleans, Louisiana
DiFlexx: A New Broadleaf Herbicide from Bayer CropScience

2014 NAICC Annual Meeting
Emerging Technologies Session
New Orleans, LA
What is DiFlexx?

A premix combination of dicamba + cyprosulfamide (safener) which provides both pre-emergence and post-emergence broadleaf weed control in corn and fallow

DiFlexx will provide growers with:

- A highly effective safened formulation of dicamba
  - Improved corn safety
  - Use of higher rates and more aggressive adjuvant systems for improved weed control
  - A wide application window- Preplant to V9 application timing

- Tank mix partner for BCS and competitive herbicides
- Excellent resistance management tool
Diflexx vs. Clarity Performance in Field Corn: 2013

- **Diflexx+MSO 16 oz/a**
  - % Crop Injury: 4.1
  - % Dicot Control: 97

- **Clarity+NIS 16 oz/a**
  - % Crop Injury: 11.4
  - % Dicot Control: 97
Clarity 16 oz/a, V4-V5 Application

Onion leafing injury symptoms

DiFlexx 16 oz/a, V4-V5 Application

Excellent crop safety

Pictures: Charlie Hicks, Colorado, 2013
Summary

- Part of an integrated weed management program
- Burndown, preemergence, postemergence and post directed applications
- Tank mix with glyphosate, Liberty, Laudis, Capreno, and other PRE and POST corn products
- Flexible adjuvant options
- Field corn, field corn grown for silage, white corn, seed corn popcorn and fallow.
- Product Launch: Full sales 2015
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National Alliance of Independent Crop Consultants

Bayer CropScience

Sheraton New Orleans
New Orleans, Louisiana
Bayer CropScience has developed a proprietary stacked Bt product TwinLink™, expressing both cry1 and cry2 genes, conferring protection from damage of a wide range of Lepidopteran pests, as well as tolerance to glufosinate ammonium (Liberty®) herbicide. TwinLink will be commercialized in the US and Brazil pending beginning in the 2014. Commercialization in other countries around the globe will follow pending local approvals.

Since 2006, extensive field testing of TwinLink™ and GlyTol® x TwinLink™ (GLT) cotton has been performed internally and with third parties in the US, Brazil, Argentina, Spain, India, and Australia. Trials with TwinLink cotton have recorded high levels of efficacy against a number of key lepidopteran cotton pests, including H. zea, H. virescens, H. armigera, H. gelotopoeon, Alabama argillacea, Psuedoplusia includes, Spodoptera spp. (frugiperda, exigua, littura, cosmioides, and eridania) and P. gossypiella.

GLT cotton provides a broad spectrum of insect protection and tolerance to both glyphosate and glufosinate ammonium herbicides, providing global cotton producers with greater choices and flexibility for weed and insect management.

Forward-Looking Statements
These statements may contain forward-looking statements based on current assumptions and forecasts made by Bayer Group or subgroup management. Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at www.bayer.com. The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.
• TwinLink™ contains two proprietary Bt genes from Bayer – Cry1Ab and Cry2Ae

• Both Cry genes contain the “BAR” gene marker which gives TwinLink full commercial tolerance to Liberty® herbicide equal to the current LL trait in GlyTol ® /LibertyLink ®

• This double Bt gene construct gives TwinLink the full Lepidopteran spectrum of insect control equal to Bollgard ® II

• In non-pink bollworm areas the “Natural Refuge” option (no cotton refuge required) is allowed for TwinLink
Spectrum of Activity

**Good Control**
- Cotton Leafworm *Alabama argillacea*
- Cabbage Looper *Trichoplusia ni*
- Soybean Looper *Pseudoplusia includens*
- Tobacco Budworm *Heliotes virescens*
- Pink Bollworm *Pectinophora gossypiella*
- Cotton Bollworm *Helicoverpa zea*
- American Bollworm *Helicoverpa armigera*
- Yellowstriped Armyworm *Spodoptera ornithogalli*
- Tropical Armyworm *Spodoptera litura*
- Fall Armyworm *Spodoptera frugiperda*
- Southern Armyworm *Spodoptera eridania*
- Beet Armyworm *Spodoptera exigua*
- Saltmarsh Caterpillar *Estigmene acrea*
- Cotton Leaf Perforator *Bucculatrix thurberiella*

**Suppression**

**0% Control**
- Beneficial insects
- Non target pests
- Cutworms *Agrotis spp.*

Bayer CropScience
TwinLink activity on bollworm is superior to Widestrike ® and similar to Bollgard II

TwinLink fall armyworm activity appears at least equal to Bollgard II based on lab/cage studies

TwinLink should be highly efficacious on all leaf-feeding Lepidopteran species (loopers, beet armyworms, saltmarsh caterpillars) in non-weedy fields
Once commercialized, (GLT) will offer the highest level of protection of any trait technology package on the market.

- **Bayer GLT**
- **Monsanto B2RF**
- **Dow WRF**

- **Glyphosate Tolerance**
  - Bayer GLT: High-Level Protection**
  - Monsanto B2RF: High-Level Protection
  - Dow WRF: High-Level Protection

- **Liberty Herbicide Tolerance**
  - Bayer GLT: Moderate Protection†
  - Monsanto B2RF: No Protection
  - Dow WRF: Not Recommended for Use††

- **Lepidopteran Pests**
  - Bayer GLT: High-Level Protection**
  - Monsanto B2RF: High-Level Protection
  - Dow WRF: Moderate Protection

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**= High-Level Protection**
†= Moderate Protection
= No Protection
††= Not Recommended for Use

*Expected commercial launch in 2014
**Confers a high level of protection from bollworms and a high level of glufosinate tolerance
†Confers only a moderate level of bollworm protection and moderate glufosinate tolerance
††The use of Liberty herbicide on WideStrike cotton is not labeled
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2014

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Thank You! The End!

Sheraton New Orleans
New Orleans, Louisiana