Emerging Technology Session
2013
National Alliance of Independent Crop Consultants

PRESENTATIONS
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
Emerging Technology Session
2013

National Alliance of Independent Crop Consultants

Ag Leader Technology
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
Plot Prescription Module

• Strategically place in-field research plots
• Great Awareness of in-field variances
Plot Prescription Module

- Design plots using advanced plot parameters
- Use buffer tools to show setback distances to neighboring crops and fields
Plot Prescription Module

- Export plot prescriptions to the ALMACO SP 360 display or share/export as shape or KML/KMZ

Please visit our booth and sms.agleader.com for more information
New Soybean Innovations From Bayer CropScience

NAICC Emerging Technologies Session
January 24, 2013

Jim Bloomberg, Bayer CropScience
Collaboration between Bayer and MS Technologies

Event FG72: Herbicide Tolerance to both glyphosate and isoxaflutole

- Anticipated availability for growers in U.S. and Canada for 2015 crop season*
- High-yielding elite germplasm with FG72 has demonstrated performance equal to or better than varieties growers are currently planting.
  - 56 lines have been selected for release in 2015
  - 225 are in advanced testing
    - Maturity range 0 through 4
- MS Tech and Bayer CropScience intend to broadly license FG72 soybeans.

*Pending regulatory approvals
FG72: A New Soybean Event With Glyphosate and HPPDi tolerance.

- Contains HPPD gene (PfW336)
  - confers tolerance to 4-hydroxyphenylpyruvate dioxygenase inhibitors (e.g., isoxaflutole)

- and 2mEPSPS gene
  - confers 5-enolpyruvyl-3-shikimate phosphate synthase inhibitors (e.g. glyphosate)

- FG72 breeding stack with LibertyLink soybean also in development
  - pat gene confers tolerance to glufosinate-ammonium
Introducing Balance bean

- **Balance bean** will be the first HPPDi herbicide available in soybean market. (New mode of action for beans)

  - M$500 of HPPD’s sold in corn market (70% applied PRE)
  - HPPD’s are widely used since they control a broad spectrum of tough broadleaf and grass weeds with **residual** control
  - Controls glyphosate-, ALS-, PPO-, Triazine- **resistant weeds**
  - Balance is like no other HPPD. It works through the roots, shoots and foliage to control broadleaves and grasses
  - Only product on the market that **reactivates** with rain

*Pending regulatory approval*
Introducing Balance bean

- With its great **burndown** Balance Bean works great in either conventional tillage or no till
- Extremely **low volatility**
- Easy **tank clean out** – no need for dedicated tanks or sprayers
- Application **flexibility** (Pre/Post timing)
- Excellent **tank mix partner** for Liberty & glyphosate
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Central States Agronomics, Inc.
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
“Database software developed for the crop consulting industry by practicing crop consultants”

• In use in my own business since 2009

• Since 2011 have sold additional licenses to 17 independent crop consultants in Nebraska
Features

• Intuitive – thinks like a crop consultant thinks
• Easily find and sort field records and observations
• Customizable to meet your needs
• Autofill enhances data entry speed & accuracy
• Summary reports quickly and easily created
• Email reports as pdf files
• Crop History – “Put Power to the Data you Collect”

www.scoutsmart.com  Mark Kottmeyer  (308) 380-3487  mkottmeyer@gmail.com
Permanent Field Data

www.scoutsmart.com
Mark Kottmeyer
(308) 380-3487
mkottmeyer@gmail.com
Annual Field Data

www.scoutsmart.com
Mark Kottmeyer
(308) 380-3487
mkottmeyer@gmail.com
Example Field Report

www.scoutsmart.com
Mark Kottmeyer
(308) 380-3487
mkottmeyer@gmail.com
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Covance Laboratories
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
Analysis of trans-Vitamin K$_1$ in Soybean Grain

NAICC Meeting
Emerging Technology Session
24 January 2013
Jacksonville, FL
Background

- OECD – New requirement for soybean seed
- Guidance does not differentiate between cis-, trans-, or total vitamin K₁
- General focus to move forward with trans-isomer
- Available methodology
Method Summary

• Samples extracted using organic solvents.
• Analyzed by reversed phase HPLC with post column reduction and fluorescence detection.
• A C30 column is used to separate the inactive cis-isomer from the active form.
• Trans-vitamin K$_1$ is quantified against standards of known concentration.
Data

- Accuracy (50, 100, 150%): 90.4% to 106%
- Precision: RSD 3.5% at 0.437 mcg/g
- Intermediate Precision: RSD 3.8, 1.8, 3.3%
- LOQ: 0.08 mcg/g (1 gram sample)
- Range: 0.008 – 0.2 mcg/mL
- Linearity: $r = 0.99997$
- Specificity
References


• USP-NF30, Oil- and Water-Soluble Vitamins with Minerals Tablets, Method 1, Page 1567

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Email: Brian.Potts@Covance.com

Acknowledgements:  
Chris Zais  
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Jeff Loos  
Ashley Hoff  
David Levin
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Dow AgroSciences

Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
Transform™ WG Insecticide Product Overview

Bobby Haygood

2013 NAICC – Jacksonville, FL

Transform is not yet registered with the U.S. EPA. Federal registration is pending. This slide is intended to provide technical information only and is not an offer for sale of product. Transform is a trademark of Dow AgroSciences LLC.
Sulfoxaflor Technical Overview

- Discovered by DAS scientists, proprietary DAS chemistry
- First insecticidal molecule from the new sulfoximine class of insecticides
- Sulfoxaflor is the active ingredient
- Designed to control many sap-feeding insects including aphids and plant bugs
- To be registered for use on cotton, soybean, cereal crops, canola, potato and other major crop groups

Sulfoxaflor Mode of Action

- The active ingredient sulfoxaflor exhibits complex and unique interactions with the insect nicotinic acetylcholine receptors (nAChR) that are distinct from those observed with neonicotinoids.

- In January 2012, DAS received notice from the Insecticide Resistance Action Committee (IRAC) that sulfoxaflor was designated as the sole member of a new subgroup, 4C (insect nicotinic acetylcholine receptor [nAChR] agonists).
Sulfoxaflor Attributes

- Excellent systemic and translaminar activity, providing control of hidden pests in the plant canopy and on the undersides of leaves
- Effective at low use rates starting at 0.75 oz/acre on cotton and soybeans
- Effective against insect pest populations resistant to other insecticides
- Fast acting, with extended residual control
- Valuable rotational partner with other chemistries
- Excellent fit in IPM programs because it has minimal impact on beneficial insects and predatory mites
- Degrades into environmentally benign byproducts without causing contamination

Sulfoxaflor is not yet registered with the U.S. EPA. Federal registration is pending. This slide is intended to provide technical information only and is not an offer for sale of product. Transform is a trademark of Dow AgroSciences LLC.
Transform™ WG Insecticide for U.S. Cotton and Soybeans

• Anticipate these use rates (per application) for key pests on cotton:
  – Aphids on cotton and soybeans: 0.75 to 1 oz product/A
  – Plant bugs on cotton: 1.5 to 2.75 oz product/A
    ▪ Effective rate on cotton is 1.5 oz
    ▪ Flexibility to use higher rates
  – Stink bugs (suppression) on cotton and soybeans:
    2.0 to 2.75 oz product/A

• Anticipate registration decision for U.S. cotton in 2013
Summary—Transform™ WG Insecticide
U.S. Cotton, Soybeans and other Crops

- Dow AgroSciences’ Transform WG will fit into US IPM programs
  - A new molecule from a novel chemical class with a unique mode of action
  - Effective against insect pest populations resistant to other insecticides
  - Controls a broad spectrum
    of sap-feeding insect pests,
    including plant bugs and aphids
  - Minimal impact on beneficial insects
  - Does not flare mites
  - Valuable rotation partner with other chemistries

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Dow AgroSciences
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
The Enlist™ Weed Control System for Corn

NAICC 2013 – Jacksonville, FL

*†Colex-D, Enlist, Enlist E3, Enlist Duo, the Dow Diamond and SureStart are trademarks of The Dow Chemical Company (“Dow”) or an affiliated company of Dow. Enlist E3 soybeans are being jointly developed by Dow AgroSciences and MS Technologies. SmartStax® is a multi-event technology developed by Dow AgroSciences and Monsanto. Roundup Ready, Roundup Ready 2 Yield and SmartStax are registered trademarks of Monsanto Technology LLC. Always follow grain marketing and IRM requirements and pesticide label directions. Components of the Enlist Weed Control System have not yet received regulatory approvals; approvals are pending. The information presented here is not an offer for sale. Enlist Duo herbicide is not yet registered for sale or use as a component of the Enlist Weed Control System. SureStart is not registered for use or sale in all states. Contact your state pesticide regulatory agency to determine if a product is registered for sale or use in your state. B.t. products may not yet be registered in all states. Check with your seed representative for the registration status in your state. Always read and follow label directions. ©2012 Dow AgroSciences LLC

**Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
Enlist™ Weed Control System

Technical Attributes:

• 2,4-D tolerance\textsuperscript{1,2}
  – Removes planting intervals in burndown applications
  – Widens/enables post emergence application window

• Upon regulatory approvals, expected to be partnered with glyphosate-tolerant trait technologies
  – In corn, will be stacked with SmartStax\textsuperscript{®2}
  – In soybeans, Dow AgroSciences plans to offer two options: Enlist soybeans + Roundup Ready 2 Yield\textsuperscript{®}; and Enlist E3\textsuperscript{™} soybeans
  – In cotton, will be stacked with 3\textsuperscript{rd} generation Bt and Roundup Ready Flex

• Additional herbicide tolerances\textsuperscript{1,2,3}
  – Glufosinate tolerance: soybeans/cotton
  – Fop tolerance: corn

\*4.7 pts./A and N-Pak AMS at 2.5% v/v
Anticipated Use Pattern in Corn

- Plant Enlist™ crop
- Soil-applied residual herbicide
- Enlist Duo™ herbicide

up to V8 stage or 30 inches
Enlist™ Duo featuring Colex-D™ Technology

- Herbicide product for use in Enlist crops
- Proprietary blend of glyphosate and new 2,4-D choline
- Will offer multiple modes of action
- Colex-D Technology will offer desirable performance characteristics

Components of the Enlist Weed Control System have not yet received regulatory approvals; approvals are pending. Enlist Duo is not yet registered for sale or use as a component of the Enlist Weed Control System.
Introducing Enlist Ahead

• First-of-its-kind management resource

• Designed for the grower and applicator

• Benefits-based resource

• Helps growers succeed while promoting responsible use of the Enlist system

• Will offer technology advancements, education and training, and management recommendations
"DuPont™ Cyazypyr™, Verimark™, Exirel™ and Benevia™ are not registered for sale or use in the United States. No offer for sale, sale or use of these products are permitted prior to the issuance of the required EPA and state registrations. “
Pending approval by US EPA, DuPont anticipates major market launches in 2013 for fruit, vegetable and other specialty crops

**DuPont™ Verimark™ insect control**—a soil applied formulation for vegetables and citrus nursery stock

**DuPont™ Exirel™ insect control**—a foliar applied formulation for vegetables; and tree fruits and nuts

**DuPont™ Benevia™ insect control**—a foliar applied formulation for cotton; oilseeds; tuberous, corm and bulb vegetables
Cross Spectrum Control with Cyazypyr™

Controls damaging sucking and chewing pests in 2013 target crops of Citrus, Apples, Cherries, Leafy and Fruiting Veg, Brassica, Cucurbits, and Potato.
**New technology** that optimizes the potential to produce high-quality, high-yielding crops

**Highly potent** to targeted pests yet has an **excellent environmental** profile

You can add this technology to your program for **maximum flexibility** in managing the crops
Prevathon® Reliable, consistent control

Prevathon®

- Soybeans *(anticipated registration Q4 2012)*
- Cotton
- Corn *(Field, Seed and Pop)*
- Sugarcane
- Sunflower *(anticipated registration Q4 2012)*
- Range and Pasture

- Longest residual from foliar application on the worm complex (up to 21 days)
- No Signal Word
- 4 HR REI
- Minimum PPE
- Safe to beneficial insects when applied in accordance with the label
- Single active to be brought in at rate and timing of choosing
- Better yields

See product label for crop/pest combinations controlled or suppressed
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EPL Bio Analytical Services
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
EPL Bio Analytical Services

Excellence, Passion and Leadership in Agriculture

Presented by:
Rex Dyer, Ph.D., Team Lead
Molecular Biology Lab
rdyer@eplbas.com
Company

- Established in 1987 – 25 Year Focus on Agricultural Science
- Consistent Growth of Business, Technology & Scientific Expertise

Team

- Average Employee: 14 Years of Analytical Lab Experience
- Active Internal / External Technical Training Programs
- Cross-Functional & Focused on Safety
- QC/QA Teams
- Lab Services
Divisions of Analytical Service
Molecular Lab
Future EPL Service Offerings

- **Services**
  - GM Crop Characterization
    - Transgene Copy Number
    - Transgene Insertion Site
    - Transgene Expression
  - R&D Support
    - Vector Construction
    - GM Candidate Plant Screening

- **Methods**
  - Southern Blotting
  - PCR
  - ELISA
Molecular Lab
Future Service Offerings

- Quantitative PCR or Real-Time PCR
  - Advantages Over Other Methods
    - Faster turnaround time & less labor relative to culture methods
    - Higher specificity & sensitivity as compared to immunological methods
  - Applications
    - Plant Pathogen Identification

- Next Generation Sequencing (NGS)
  - Advantages Over Other Methods
    - Simplicity & Consistency over Southern Blot Analysis
    - Cost effective - $6/Mbp vs $500/Mbp for automated Sanger Sequencing
  - Applications
    - Localization of transgene insertion site(s) and copy number
    - Flanking sequence analysis
    - Transcriptional analysis – important with New Plant Breeding Technologies
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FMC Corporation
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
FMC Corporation
Craig Heim, Ph.D.
Technical Sales Manager - NC, SC, GA, & FL
### 2013 EPA Registrations

#### DISEASES

<table>
<thead>
<tr>
<th>Disease</th>
<th>RATES</th>
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<tr>
<td>Anthracnose</td>
<td>20.5 to 45.7 fl oz/A (0.34 - 0.75 lbs ai/A)</td>
</tr>
<tr>
<td>Botrytis</td>
<td></td>
</tr>
<tr>
<td>Powdery Mildew</td>
<td></td>
</tr>
<tr>
<td>Brown Rot, Blossom Blight</td>
<td>20.5 to 45.7 fl oz/A (0.34 - 0.75 lbs ai/A)</td>
</tr>
</tbody>
</table>
- New mode-of-action fungicide - stops chitin production and destroys elements of fungal cell walls
- Contact, preventative action
- 0 day PHI, 4 hour REI
- 2.1 SE formulation
- Federal registration expected 1Q 2013
Problad Plus™ Fungicide

Controls Wide Spectrum of Diseases
- Powdery mildew
- Botrytis
- Anthracnose
- Monilinia

Unique Mode of Action
- Reduces resistance potential
- New disease fighting tool

Expected Short PHI and REI*
- Grower flexibility
- Worker safety

Compatible Formulation
- Adjuvant compatible
- Tank mix compatible

* Federal registration expected early 2013
A New Tree, Fruit, and Vegetable Fungicide from FMC

For more information visit the FMC booth in the exhibit hall or go online at fmccrop.com
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Helena Chemical Company
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
N-FIXX AS A NITROGEN FERTILIZER ADDITIVE

Abstract

Ammonia volatilization studies were conducted by Mississippi State University and University of Arkansas to determine the effectiveness of a new nitrogen fertilizer additive introduced as N-FIXX by Helena Chemical Company. The compound NBPT [N-(n-butyl) thiophosphoric triamide], a urease inhibitor, has been studied for many years as a source for preventing or reducing volatilization losses of ammonia to the air over a given period of time. N-FIXX is a product growers can use to help mitigate volatilization and protect yield potential when applying Urea and nitrogen fertilizers that contain Urea.
N-FIXX vs AGROTAINT ULTRA
LABORATORY VOLATILIZATION STUDY

Location: U of AR
Researcher: Dr. Trent Roberts
Trial type: Laboratory Chambers

% N Loss

Untreated Check had largest increase of Nitrogen loss statistically versus all other treatments

Day 1
Day 4
Day 7
Day 11
Day 14
Day 18

Urea (check)  Agrotain Ultra  Agrotain Ultra  N-Fixx  N-Fixx
3 qt/ton  4 qt/ton  (3 qt/ton)  (4 qt/ton)
N-FIXX vs AGROTAINE ULTRA
LABORATORY VOLATILIZATION STUDY

No Statistical Difference Between Treatments

Location: U of AR
Researcher: Dr. Trent Roberts
Trial type: Laboratory Chambers
N-FIXX vs AGROTAINE ULTRA
LABORATORY VOLATILIZATION STUDY

% Loss – NH3 based on applied

% N Loss

- UREA UTC
- Agrotain Ultra - 3 qt
- N-FIXX - 3 qt

3 DAT 7 DAT 10 DAT 14 DAT 18 DAT 22 DAT

Mississippi State University
Researcher: Dr. Tim Walker
Study type: Laboratory Chambers
Summary

• Urease inhibitors like N-FIXX help protect against N loss caused by volatilization and protect the growers fertilizer investment.
• Across all observation dates at both universities, untreated Urea lost an average of 29.4% N to volatilization at 18 Days.
• Treatments of Urea treated with N-FIXX lost less than 2% N to volatilization.
• Labels are available on Agrian.com and CDMS.com
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IRAC-US
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
Insecticide Mixtures and Insecticide Resistance Management (IRM)

Visit us at Booth # 121
www.irac-online.org

NAICC Annual Meeting, Jacksonville, FL
January 24, 2013
Insecticide Mixture

- Two or more insecticidal active ingredients applied in a single application
- Tank mixed or a pre-formulated mixture
- ‘Pest management’ not ‘Resistance management’ is the primary consideration for use of mixtures
Value of Mixtures

- Increasing the level of target pest control
- Broaden the spectrum of pest species controlled
- Most mixtures are NOT primarily used for IRM

> The value of mixtures is typically NOT IRM
Strategies for Insecticide Resistance Management (IRM)

- Rotation of insecticide modes of action is considered a highly effective IRM approach
- Mode of Action classifications now appear on most insecticide labels
- Mixtures may offer IRM benefits when properly incorporated into rotation strategies

Visit us at Booth # 121

www.irac-online.org
IRM Considerations when using mixtures

- Mixture products should be highly effective and applied at full labeled rates
- Avoid mixture with components having same IRAC Mode of Action
- Consider any known resistance or cross-resistance between components and target pests
  > Resistance to one or both components reduces control and increases resistance development.
- IRM benefits of mixtures are greatest if components have similar periods of residual activity

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www.irac-online.org

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January 24, 2013
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iPiPE
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida
iPiPE

An Information Technology Solution for Pest Monitoring and Modeling

Julie Golod, Scott Isard  
Pennsylvania State Univ.  
University Park, PA

Roger Magarey  
North Carolina State Univ.  
Raleigh, NC

Joe Russo  
ZedX, Inc.  
Bellefonte, PA

National Alliance of Independent Crop Consultants  
NAICC Annual Meeting  
Jacksonville, Florida  
January 24, 2013
iPiPE: Progress thru Sharing
An Evolutionary Step for Industry

iPiPE evolved from NAPPFAST and ipmPIPE IT platforms.

iPiPE was expanded to include crop consultants, company reps, and others.
• Pest Data Submission
  - Regulated, quarantine (e.g. late wilt of corn)
  - Regulated, non-quarantine (e.g. Goss’s wilt)
  - Non-regulated, supervised (e.g. soybean rust)
  - Non-regulated, non-supervised (e.g. corn rootworm)

• Pest Data Viewing
  - Display individual’s observations as points
  - Shared data displayed as county centroids
  - Observations overlaid on model output
  - Observations tracked through time

• Pest Data Sharing
  - Able to share data with other participants
  - Contribute to regional picture of pest activity
  - Data sharing rules protect individual privacy
  - Data sharing rules respect pest regulatory status
iPiPE: Progress thru Sharing
Observations as Model Input

Types of models
- HYSPLIT trajectory
- Aerobiological
- Epidemiological
- Local physiological

Pest candidates for models
- Soybean
  - Asian soybean rust
  - Frogeye leaf spot
- Corn
  - Southern corn rust
  - Goss’s wilt
- Cereal
  - Leaf rust
  - Stem rust
  - Stripe rust

Example of HYSPLIT hourly spore trajectories
Types of field observations confirmed by:
- USDA-APHIS PPQ certified lab
- Non-federal certified lab
- Extension specialist
- Diagnostic in-field test
- Without confirmation

Types of map products
- Weather variables
- Crop distribution
- Pest distribution
- Pest predicted spread
- Pest local development

Example of 2011 predicted spread of Goss’s wilt
Pioneer Seed Treatment Strategy - Soybeans

Provide the best combination of insecticide, fungicide, and other seed treatment amendments that complement Pioneer’s unique proprietary genetics and traits.
Exclusive Fungicide – Evergol®

- 3 Modes of action that include; Penflufen, Prothiconazol and Metalaxyl
- Improved control of Rhizoctonia and Fusarium over Trilex
- First registered next generation fungicide
- Easily adopted downstream – replaces Trilex 2000®

*Petri Dish Inoculated with Rhizobia Spores

<table>
<thead>
<tr>
<th>Crop</th>
<th>Disease</th>
<th>Evergol® Energy</th>
<th>Trilex® + Allegiance®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td><em>Rhizoctonia</em></td>
<td>+++</td>
<td>+++</td>
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<tr>
<td></td>
<td><em>Seedling Rot</em></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><em>Fusarium</em></td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td><em>Seedling Blight</em></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><em>Pythium</em></td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td><em>Damping off</em></td>
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</tr>
<tr>
<td></td>
<td><em>Seedborne Fungi</em></td>
<td>+++</td>
<td>++</td>
</tr>
</tbody>
</table>

+++ Excellent Activity   +++ Good Activity
++ Fair Activity        ++ Little Activity
+ No Activity

Poncho®, Votivo®, Gaucho®, Allegiance®, Evergol® Energy®, Trilex 2000® and Bayer® are registered trademarks of Bayer.

The DuPont Oval Logo is a registered trademark of DuPont.
© 2012 PHII .
**EverGol™ Energy** *Yield (Bu/A) Advantage vs. Untreated*

30 replicated research locations, 2010 & 2011

- Positive soybean yield advantage at 27 of 30 research locations
- Average of 1.4 bu/a yield advantage across all locations
- LSD (0.05) = 0.6 bu/acre

*EverGol™ Energy + Allegiance + Gaucho + PPST 2030*
• Positive soybean yield advantage at 19 of 30 research locations
• Average of 0.27 bu/a yield advantage across all locations
• Average of 0.78 bu/a yield advantage across positive yield advantage locations

* EverGol™ Energy + Allegiance + Gaucho + PPST 2030
** Current Standard = Trilex 2000 + Allegiance + Gaucho + PPST 2030

* EverGol Energy is a registered trademark of Bayer.
Soybean Seed Treatment Amendment Testing

Yield Advantage: FST + IST + PPST 2030 vs non-treated check

- Ave. yield advantage of FST/IST + PPST 2030 vs. non-treated was 1.1 bu/acre across all locations in 2011.

- A positive yield advantage associated with FST/IST + PPST 2030 in 73 of 112 (65%) locations with a 2.3 bu/acre advantage.
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Smithers Viscient
Hyatt Regency Jacksonville Riverfront
Jacksonville, Florida

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Accurate Mass Spectrometry for Agricultural Chemicals Research

What is the molecular formula?
Does Mass $219.96 = \text{C}_8\text{H}_6\text{Cl}_2\text{O}_3$ 

<table>
<thead>
<tr>
<th>Choice #</th>
<th>MF</th>
<th>Monoisotopic mass</th>
<th>PPM</th>
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<td>$\text{C}_8\text{H}_5\text{Cl}_3\text{N}$</td>
<td>219.9487573</td>
<td>51.115</td>
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<tr>
<td>10</td>
<td>$\text{C}_{14}\text{HClO}$</td>
<td>219.9715924</td>
<td>52.699</td>
<td>11.592</td>
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</table>

No

No

No

No

Choice # | MF          | Monoisotopic mass | PPM   | mDa    |
<table>
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<td>1</td>
<td>$\text{C}_8\text{H}_6\text{Cl}_2\text{O}_3$</td>
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<td>2</td>
<td>$\text{C}_6\text{H}_3\text{Cl}_3\text{NO}_2$</td>
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<td>219.9806329</td>
<td>51.058</td>
<td>11.232</td>
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Yes
Current Applications

- High resolution accurate mass (HRAM) / accurate mass instrumentation for metabolite identification
- High resolution accurate mass (HRAM) / accurate mass instrumentation for quantitative residue analyses
- LC and GC coupled accurate mass instrumentation
- Use of accurate mass instrumentation multi-residue analyses
- Mass spectrometry for confirmation of the identity of residues
- Analytical issues associated with accurate mass instrumentation
- New and novel approaches in accurate mass (e.g. data interpretation / handling, ionization source technology, ion mobility)
- Food and feed screening analyses
- Environmental monitoring studies
- Targeted and non-targeted pesticide analyses
- Use of accurate mass instrumentation for pesticide discovery
Current Hot Topics

• New and novel approaches in accurate mass (e.g. data interpretation / handling, ionization source technology, ion mobility)
• Food and feed screening analyses
• Environmental monitoring studies
• Targeted and non-targeted pesticide analyses
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2013

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