

2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

PRESENTATIONS

**Hyatt Regency at the Arch
St. Louis, Missouri**

2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

Spensa Technologies

**Hyatt Regency at the Arch
St. Louis, Missouri**

Protecting Non-GMO Crops with Revolutionary Insect Traps

Abstract

Stephen Roswarski, Spensa Technologies

Purdue Research Park: 1281 Win Hentschel Blvd, West Lafayette, IN, 47906

EMERGING Technology

Consumer demand for non-GMO crops only continues to increase. In light of these demands, along with the recent reports that GMO traits have not been effective for some insect pests, new technologies are being introduced to the market to help prevent pest problems. One such emerging technology is the Z-Trap Network, which helps to identify, monitor, and treat pest problems while also enabling near real-time pest management capabilities for non-GMO crops. In this presentation, Johnny Park will explore how growers and retailers alike can implement solutions like the Z-Trap Network to manage insect pests more effectively and proactively.

Spensa Technologies

**Hyatt Regency at the Arch
St. Louis, Missouri**



SPENSA

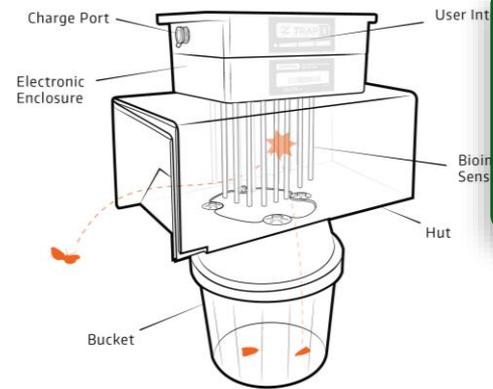
Protecting Non-GMO Crops with
Revolutionary Insect Traps



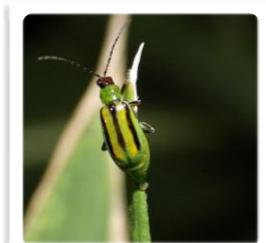
STEPHEN ROSWARSKI
AREA SALES DIRECTOR

ZTRAP 1

- 🦋 Increasing pest resistance to GMO traits
- 🦋 Demand for Non-GMO
- 🦋 Importance of in-season management



NON
GMO





- 🦋 Collect structured and quantitative pest data
- 🦋 Send high impact visual reports all within an easy-to-use mobile interface

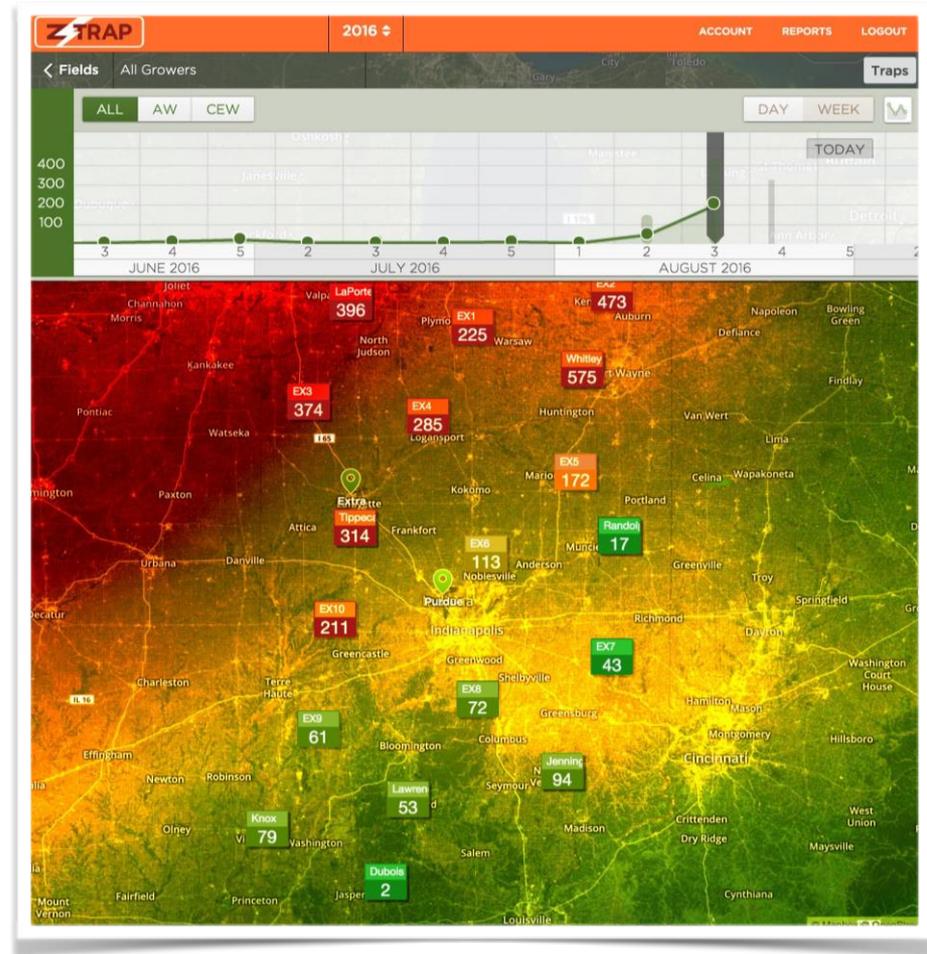




INSECT NETWORK

🦋 Major row crop pests are migratory

🦋 Z-Trap Network will be able to monitor and forecast pest migrations



SPENSA

Booth 306



2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

Dow AgroSciences

**Hyatt Regency at the Arch
St. Louis, Missouri**

Resicore[®] Herbicide with trusted residual activity deep into the growing season

Abstract

**Bobby Haygood, Dow AgroSciences, Indianapolis, IN
EVOLVING Technology**

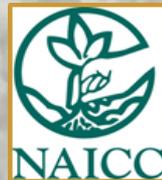
Resicore[®] Herbicide is a new corn herbicide concept that uniquely formulates three proven active ingredients never seen before in a single offering. This exclusive formulation contains three separate modes of action and does not include atrazine or glyphosate. Resicore herbicide is expected to provide control of a broad spectrum of grass and broadleaf weeds, including many herbicide-resistant weeds. Resicore herbicide is intended to exceed industry standards with residual activity for weed control deep into the growing season.

[®]TMTrademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow.

Resicore is not registered for sale or use in all states. Contact your state pesticide regulatory agency to determine if a product is registered for sale or use in your state. Always read and follow label directions.

Dow AgroSciences

**Hyatt Regency at the Arch
St. Louis, Missouri**



2017 Emerging and Evolving Technology Session



**National Alliance of
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Excellence Through Stewardship

**Hyatt Regency at the Arch
St. Louis, Missouri**

Excellence Through Stewardship & Improving Your Quality Management Results

Abstract

Eric Van Ausdal

Excellence Through Stewardship 1201 Maryland Ave SW, Washington DC 20009

EVOLVING Technology

Excellence Through Stewardship is a global not-for-profit organization that promotes the universal adoption of best practices for the full lifecycle of agricultural biotechnology products. We assist member organizations in the implementation (or improvement) of stewardship programs and quality management systems and then facilitate independent 3rd-party audits to verify them. The agricultural biotechnology industry's changing nature demands constantly evolving best technology management practices. ETS is at the forefront of that evolution, and through a commitment to continuous improvement, develops new tools and resources to meet the evolving needs of the industry. ETS is an excellent means to demonstrate your organization's commitment to stewardship that the industry demands.

Excellence Through Stewardship

**Hyatt Regency at the Arch
St. Louis, Missouri**



Excellence Through Stewardship (ETS)

The agricultural biotechnology industry is highly committed to the responsible management of its products and continues to invest in stewardship practices and quality management systems. Excellence in stewardship is the key to maintaining the freedom to operate across the value



Excellence Through Stewardship (ETS) is a global industry-coordinated organization that promotes the universal adoption of stewardship programs and quality management systems for the full life cycle of biotechnology-derived plant products.

EXCELLENCE THROUGH
STEWARDSHIP®

Advancing Best Practices in Agricultural Biotechnology



Biotechnology Plant Product Stewardship

Stewardship is a **life cycle approach** to product management. It is the responsible way to manage biotechnology-derived plant products from their **discovery and development to their use**



Support Regulatory Compliance

Maintain Product Integrity

Assist in Preventing Trade Disruptions

Maximize Technology Benefits

Share Best Practices

Promote Stakeholder Engagement

Drive Continuous Improvement



EXCELLENCE THROUGH
STEWARDSHIP®

Advancing Best Practices in Agricultural Biotechnology

Excellence Through Stewardship

At ETS, our members:

1. Commit to **principles and best management practices** for the responsible global management (handling, governance, oversight, etc.) of biotechnology derived plant products
2. Can use **high quality technical resources** to help implement related stewardship and quality management systems (QMS)
3. Undergo a **Global Stewardship Audit Process** involving an independent third-party audits to verify that members have developed and implemented appropriate stewardship

Guidance and Auditable Areas

General Product Stewardship
 Product Launch Stewardship
 Maintaining Plant Product Integrity
 Incident Response Management
 Resistance Management
 Product Discontinuation

Potential Auditable Activities

Headquarters
 Laboratory
 Containment Facility (i.e., greenhouse / growth chambers)
 Plant and Seed Multiplication / Production
 Confined Field Trial
 Commercial Plant and Seed Distribution



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 STEWARDSHIP®

Advancing Best Practices in Agricultural Biotechnology

Membership

Membership is available to organizations engaged in discovering, developing, handling or commercializing biotechnology plant products. Current membership includes more than 40 organizations from around the world from small one location research groups to large multi-nationals to contract researchers working with all sorts of crops. Membership includes access to all our technical resources, internal support and unique networking opportunities. Our generous yearly dues structure reflects our knowledge of the different sizes and abilities of our members.

Designed to Accommodate any Size, Scope or Type
of Operation



EXCELLENCE THROUGH
STEWARDSHIP®

Advancing Best Practices in Agricultural Biotechnology

Excellence Through Stewardship (ETS)

Stop by our booth to learn more!

ExcellenceThroughStewardship.org



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STEWARDSHIP®

Advancing Best Practices in Agricultural Biotechnology

2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

Charah Agricultural Products

**Hyatt Regency at the Arch
St. Louis, Missouri**

SUL4R-PLUS® granular calcium sulfate engineered to improve crop yield

Abstract

Daron Bell

Charah Agricultural Products, 12601 Plantside Drive, Louisville, KY 40299

EMERGING Technology

SUL4R-PLUS® fertilizer is a granular calcium sulfate engineered to improve crop yield. While synthetic gypsum previously has been used in agriculture, Charah Agricultural Products has a patent-pending process to create granules making sulfur application easier and meeting the farming industry's increasing demand for sulfur. Unlike any other sulfur fertilizer available, SUL4R-PLUS's granular form makes sulfur and calcium application efficient and immediately available to the plants, enhances soil quality, boosts yield, and improves the health of crops. It can be applied and blended with other dry inputs, spreads evenly for superior coverage, and contains calcium with boron and zinc options available.

Charah Agricultural Products

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St. Louis, Missouri**



It's all about the PLUS.



SUL4R-PLUS™

**FREE SAMPLE AT
SUL4RPLUS.COM**

SUL4R-PLUS granular calcium sulfate fertilizers provide revolutionary performance and formulation:

- **SUL4R-PLUS®**
 - Ca 21%, S 17%
- **SUL4R-PLUS® ZINC**
 - Zn 3%, Ca 18%. S 16%
- **SUL4R-PLUS® BORON**
 - B 1.5%, Ca 18%, S 15%



SUL4R-PLUS®



SUL4R-PLUS® ZINC



SUL4R-PLUS® BORON



- Patent-pending process creates uniform granules
- Every granule delivers every nutrient so efficient nutrition to the plant
- Consistent shape and density for minimal segregation
- Works with other inputs for easy blending and applications
- Spreads evenly 90 – 120 feet
- 7 to 10 times greater granules per square foot

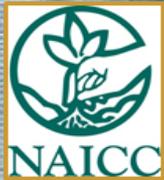


- Highly soluble for immediate impact
- Retains density and shape in heat and humidity
- Dust-free handling
- Phosphorous-free
- Spread pattern tested and endorsed by New Leader
- Leads market in quality and consistency



Visit
SUL4R-PLUS.com
or call
844-822-8385
for more information

2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

EAG Laboratories

**Hyatt Regency at the Arch
St. Louis, Missouri**

Evolving Strategies for Isolating Edible Crop Fractions

Abstract

Del A. Koch, Presenter

EAG Laboratories – Columbia; 7200 E. ABC Lane, Columbia MO 65202

EVOLVING Technology

For magnitude of the residue (MOR) studies performed according to US EPA's crop field trials guidance, there is increasing interest in determining the residues of pesticides in the crop edible portion only (for at least a selected number of samples generated by field trials), which creates special challenges for some raw agricultural commodities. Melon pulp (only) samples, in particular, will be presented as a case study. The factors to be considered when deciding whether to have the melons peeled at the field cooperator site, versus peeling frozen whole melons following receipt at the analytical laboratory, will be considered and discussed.

EAG Laboratories

**Hyatt Regency at the Arch
St. Louis, Missouri**



Evolving Strategies for Isolating Edible Crop Fractions

Del A. Koch, Presenter

EAG Laboratories – Columbia

7200 E. ABC Lane, Columbia MO 65202

NAICC 2017 Annual Meeting

January 17-21, 2017

Hyatt Regency at the Arch
St. Louis, MO

Raw Agricultural Commodity (RAC), as Defined, Does **Not** Always = Portion To Be Analyzed

- FDA's PAM I defines various “whole” RACs (1), citing US EPA regulations that compliance with a pesticide tolerance is based the whole commodity (2), but...
 - Allows for exceptions based upon specific tolerances, giving the example of an organophosphate insecticide on melons specifying “the edible portion with rind removed” (3), even though most other tolerances specify the whole commodity (4).
 - For stone fruits (e.g., peaches, cherries, etc.) and olives, pits are to be removed to produce the RAC.
 - However, citrus fruit and bananas (like melons) are not peeled when generating the RAC.
- Exceptions to the strict RAC definitions are now commonly being employed in order to address risk assessment concerns.

(1) Pesticide Analytical Manual Volume I, Table 102-2, US FDA, 1/94

(2) 40 CFR 180.1 (j)

(3) 40 CFR 180.157

(4) Pesticide Analytical Manual Volume I, Page 102-1, US FDA, 1/94

Additional Considerations Beyond the USA

- JMPR (Joint FAO/WHO Meeting on Pesticide Residues) makes the distinction between data for dietary intake assessment and data for MRL (i.e., tolerance) evaluation, and recommends that bananas (for example) be separated into peel and pulp. OECD 509 calls for separation of citrus, but not bananas.
 - Peel and pulp residue level differences can be significant for foliar-applied products, while systemic uptake into the crop typically results in a more even distribution which may not warrant the extra expense of separate analyses.
 - While analysis of a selected number of separated peel and pulp samples may be used (along with the measured weights of each component) to calculate a distribution factor that can be applied to all study samples, some uncertainties will result (especially if total residue levels are low).
- A further means of generating more realistic residue levels for dietary exposure assessments is to analyze selected samples as “Prepared for Consumption,” which may specify rinsing or washing of the commodity prior to analysis.

Generation of the Portions To Be Analyzed in the Field versus in the Laboratory

- Challenges to laboratory generation (from whole commodity)
 - Some commodities are difficult to handle in the frozen state – melons can be peeled while frozen, but this requires a sharp implement, and some practice.
 - Entire commodity must be shipped (for melons, peeling could be combined with quartering and shipping just $\frac{1}{2}$ of the sample volume otherwise).
 - For stone fruits such as cherries, removal of the pits from the frozen commodity requires



cutting the individual fruits in two and removing the pit manually, while keeping everything on (dry) ice. Pitting may be accomplished much more quickly when the fruits are fresh by utilization of a pit remover.



Generation of the Portions To Be Analyzed in the Field versus in the Laboratory (Cont'd)

- Challenges to generation of analysis portion in the field (from whole commodity)
 - Logistics (such as manpower limitations) may preclude the capability for the samples to be peeled, pitted, etc. in a timely manner.
 - Because the possibility of enhanced enzymatic degradation (of the target analytes) are amplified once the commodity is pitted (or peeled, in the case of melons), immediate transfer to a freezer or placing on dry ice dry after pitting/peeling is another possible logistical constraint.
- Commodities such as almonds which typically require shelling, to be followed by separation into hulls (a livestock feed commodity) and nutmeats are typically handled efficiently in a field setting.
- ***Please stop by the EAG Booth in the Exhibit Hall for further discussions!***



2017 Emerging and Evolving Technology Session



**National Alliance of
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Bayer CropScience

**Hyatt Regency at the Arch
St. Louis, Missouri**

Glytol LibertyLink TwinLink Plus® Cotton – Double Herbicide Tolerance and Triple Insect Protection

Abstract

Walt Mullins

Bayer

EMERGING Technology

Bayer will launch the Glytol LibertyLink TwinLink Plus cotton technology in 2017 in Fibermax and/or Stoneville varieties. This new trait technology stacks glyphosate and Liberty® tolerance with three insect Bt genes for triple insect protection. This trait technology combines the most robust commercial tolerance to both glyphosate and Liberty as well as the highest level of Lepidopteran insect protection (particularly against bollworms and fall armyworms) that is on the market today. With three different sites of action for insect control (Cry1Ab, Cry2Ae and Vip3A Bt genes) working simultaneously, this technology will significantly improve the level, consistency and sustainability of Lepidopteran insect control over the current standards.

Bayer CropScience

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TwinLink[®]
Plus

Walt Mullins

NAICC Annual Meeting - 2017

**EMERGING and EVOLVING
TECHNOLOGIES III**

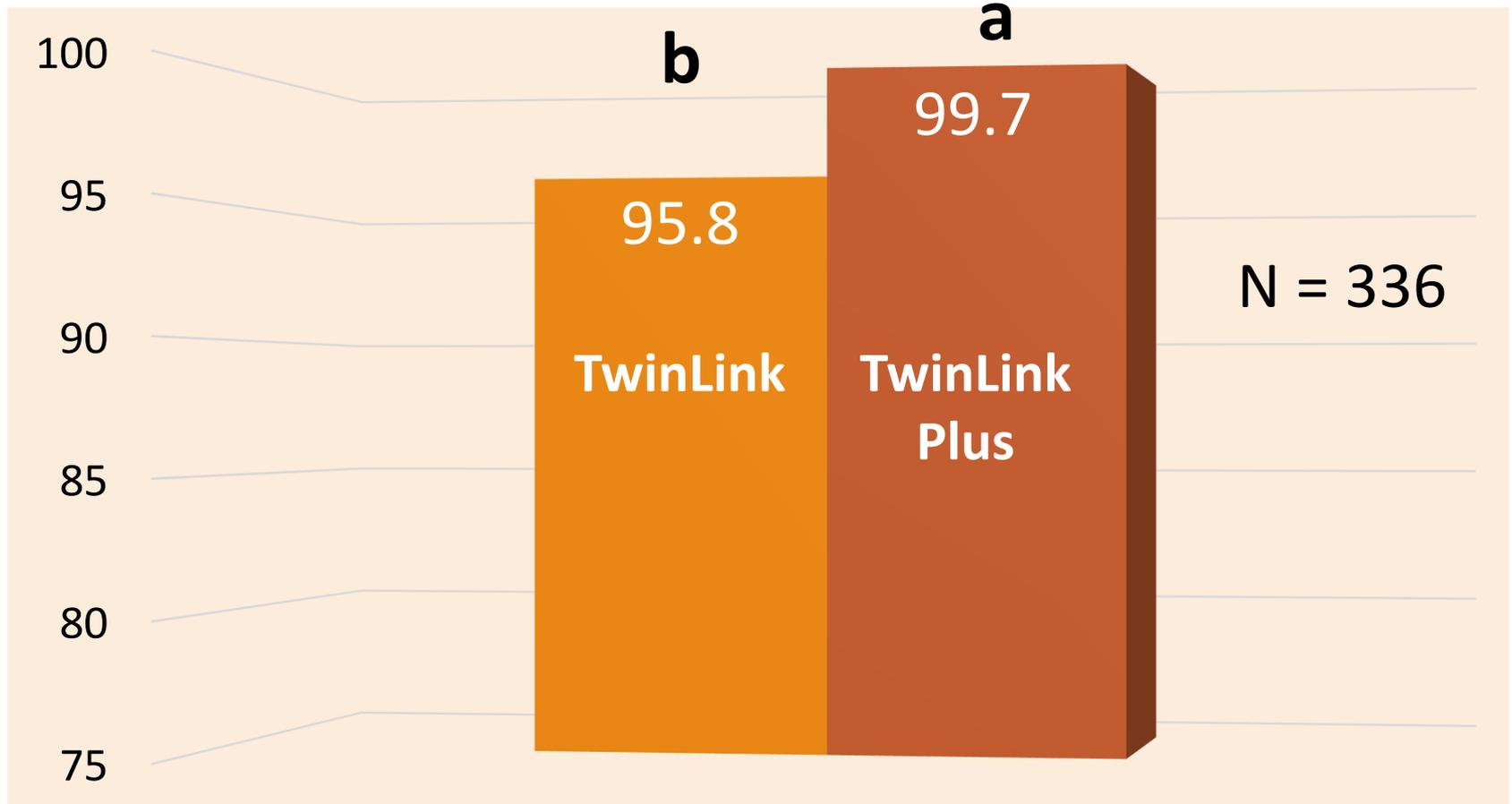


TwinLink[®]
Plus

- TwinLink[®] Plus expresses three Bt genes:
 - Cry1Ab, Cry2Ae, and Vip3a
- Improved protection against bollworm and fall armyworm
- Three modes of action for better IRM
- 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[®]
 - Also provides full tolerance to glyphosate

% Reduction in Damaged Squares and Bolls as compared with non-Bt Cotton

(Dr. Scott Stewart, Univ. of Tennessee, 2015)



■ 2-Gene ■ 3 Gene



GlyToI[®]

LIBERTY
LINK[®] 

TwinLink[®]
Plus

- Improved bollworm control
- Excellent fall armyworm control
- Improved consistency of worm control
- Three Bt genes for better IRM
- Best Liberty[®] tolerance on the market
- Available in both Stoneville[®] and Fibermax[®] varieties

2017 Emerging and Evolving Technology Session



**National Alliance of
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Farm Dog Technologies

**Hyatt Regency at the Arch
St. Louis, Missouri**

Creating the system of record for pest and disease management

Abstract

Liron Brish

Farm Dog Technologies, Arnon 6/9, Tel Aviv, Israel 63455

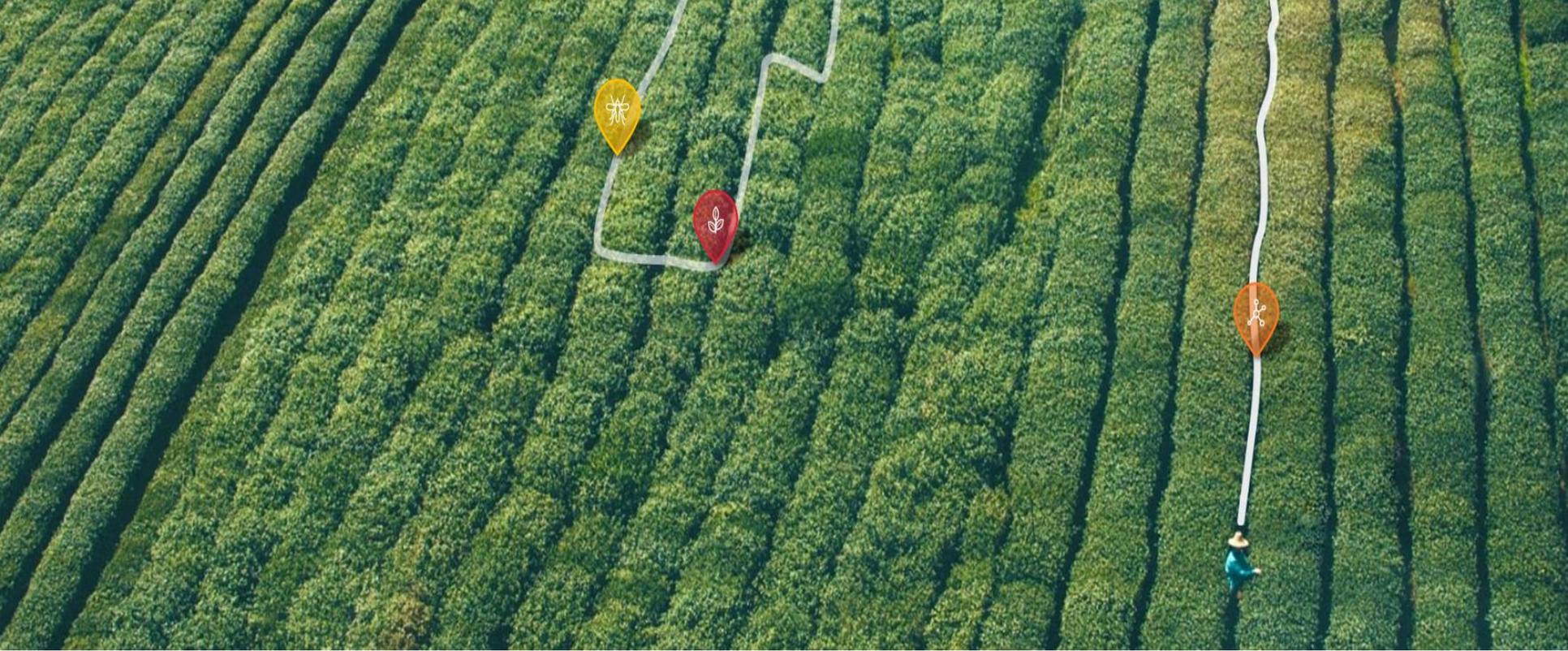
EMERGING Technology

With almost \$60 billion spent on pesticides yet continued 20% to 40% crop loss due to pest and disease, our methods of managing these threats is failing. The lack of a standardized and comprehensive system of record of findings and treatments impedes any substantial improvements. Farm Dog is the first such system of record which improves grower-agronomist communication and provides field-specific and regional-level data analysis. Full offline functionality and hand-in-hand development with leading scouts has resulted in an easy-to-use tool currently utilized on 100,000+ acres and \$150 million worth of crops protected.

Farm Dog Technologies

**Hyatt Regency at the Arch
St. Louis, Missouri**





FARM DOG

Precision agriculture for pest and disease
management



NAICC

**BOOTH
606**

January 19, 2017

www.farmdog.ag

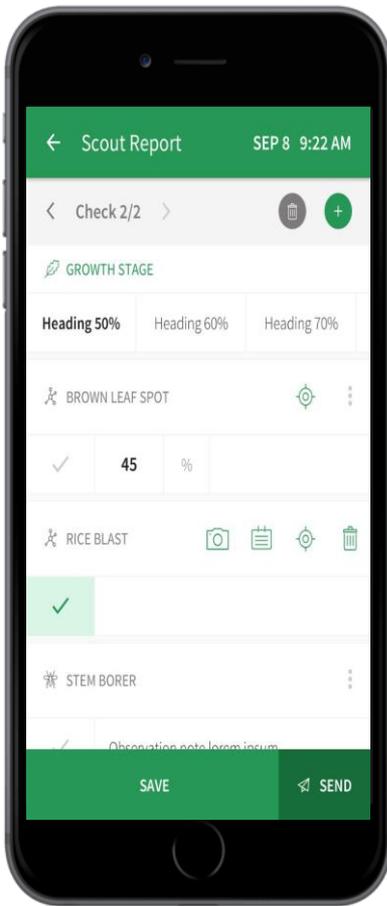
What can you do with Farm Dog?

- Easily document scout data and observations from any phone or tablet, off-line and on-line
- Communicate your findings in real-time with your growers, scout teams, and all other stakeholders
- Manage and track your workforce and time spent in the field
- Analyze your findings



**BOOTH
606**





Scout Report

Scouted by: Mattison
Supervisor: Will

GLADES crop care inc.

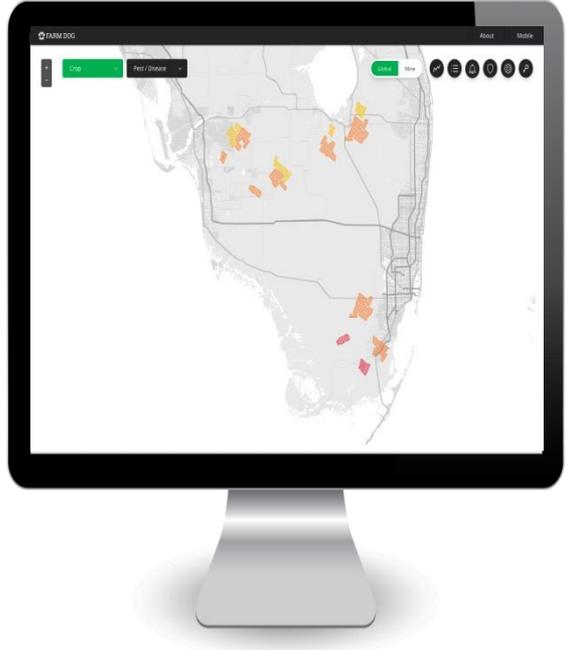
Glades Corp Care, Inc.
949 Turner Quay, Jupiter, Florida 33458
p. 561/746-3740 f. 561/746-3775
www.gladescropcare.com

FARM SCGC (Main Farm, Gilmore Hillsboro) **WEDNESDAY, AUG 25, 2016**

SUMMARY
Lygus in fields is above threshold. I'd recommend spraying tarzan12 first thing tomorrow morning. Also I'm concerned about low water levels.

Field	38-CD-285 (E) REX	38-CD-285 (E) REX	38-CD-285 (E) REX	38-CD-285 (E) REX	38-CD-285 (E) REX
Stage	Hard dough to mature	Hard dough to mature	Hard dough to mature	80% heading	100% heading
Diseases					
Brown Leaf Spot	0-1 on 2-3 panicles	0-1 on 2 panicles	0-1 on 1-2 panicles	0-1	On flag 1 leaf
Rice Blast	✓	✓	✓	✓	✓
Sheath Blight	✓	✓	✓	✓	✓
Insects					
Rice Stinkbugs Avg#/10 Sweeps	0.6	✓	1.3	1	10+(N) 5(S)
Stem Borer	✓	✓	✓	✓	✓
Rice Water Weevil	LOW Feeding Damage	LOW Feeding Damage	✓	LOW Feeding Damage	✓
Grasshoppers	LOW	LOW	✓	LOW	✓
Worms %Type/Stage	✓	✓	✓	✓	✓
Physical					
Water Levels	0"	✓	✓	✓	✓
Nutritional	✓	✓	✓	✓	✓
Notes					
Taggart at Hillsboro is <10% heading					
(1) Observation note					
(2) 3-5"					

Powered by FARM DOG page 1/1



JOHN DEERE



BOOTH 606



Workforce management

Control who
sees what fields

Manage
observations
lists and data in
real-time

GPS and time
tracking
customization



**BOOTH
606**



Analysis – treatment efficacy

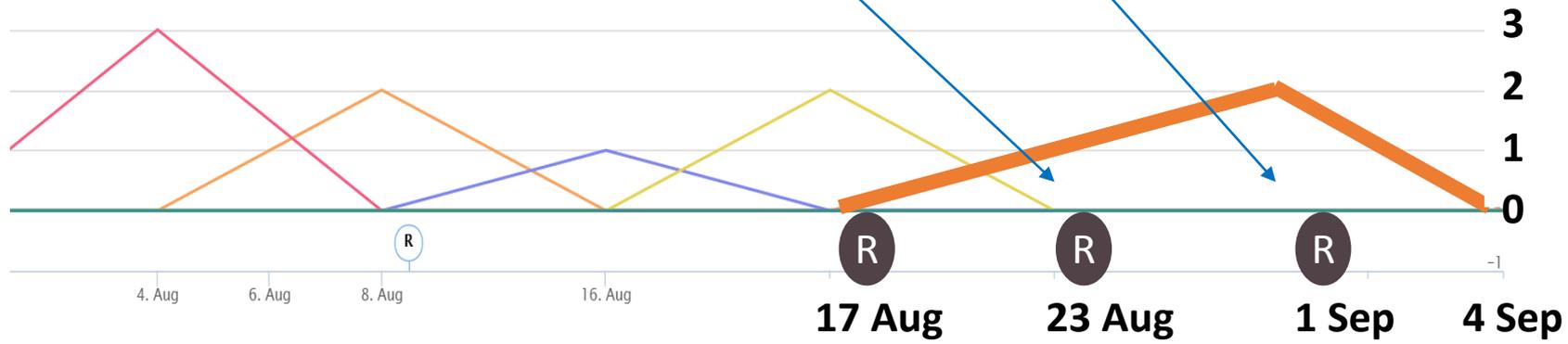
TK 147

Zoom 1m 3m 6m YTD 1y All

Lannate 100 /
Telstar 100 **FAIL**

Dorsan 150 /
Titan 100
SUCCESS

From Aug 2, 2016 To Sep 5, 2016



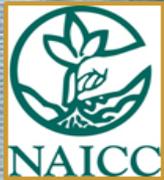
Recommendations Aphid Whitefly - Adult Pink bollworm - Eggs Pink bollworm - Hatch Mealybug Spiny boll worm - Eggs Spiny boll worm - Hatch



**BOOTH
606**



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Winfield United

**Hyatt Regency at the Arch
St. Louis, Missouri**

StrikeLock®: A novel HSOC adjuvant with drift and deposition properties

Abstract

Jo Gillilan, Ph.D.

Winfield United, Shoreview, MN

EMERGING Technology

StrikeLock® is a novel MSO-HSOC adjuvant that optimizes performance of hydrophobic herbicides with the additional benefit of drift control and droplet deposition. MSO-HSOC adjuvants are classified as containing 25-50% w/w surfactant with a minimum of 50% w/w oil. MSO-HSOC's have shown excellent compatibility with glyphosate while providing equivalent performance to other oils. US field trials supported that StrikeLock® had equal or better efficacy to other MSO-HSOC products, while maintaining glyphosate compatibility. Drift performance testing revealed a decrease in fine droplet production comparable to other commercial drift reduction agents. StrikeLock® will be available in the marketplace in 2017.

Winfield United

Hyatt Regency at the Arch
St. Louis, Missouri



**WINFIELD®
UNITED**

Booth 511



StrikeLock™

DEPOSITION AID, CANOPY PENETRANT, DRIFT CONTROL AGENT
AND HIGH SURFACTANT OIL CONCENTRATE

Introduction of StrikeLock™ : A Novel Adjuvant System

NAICC 2017 Evolving and Emerging Technologies
St. Louis, MO
Jan 19, 2017

Jo A. Gillilan*,
Ryan J. Edwards,
Greg K. Dahl
Eric P. Spandl,
Joe V. Gednalske,
Raymond L. Pigati,
David A. Van Dam

StrikeLock™

- Newest member of the InterLock® family of adjuvants
- MSO based HSOC with added drift/deposition aid and performance increasing surfactant
- Specifically designed for use with oil loving herbicides or herbicides that are more efficacious when an MSO is added
- Optimizes deposition and limits drift- more droplets land on the target
- Use Rate: 0.5% v/v or 6.4-8 fl oz/A



Sharpen 2 fl oz (21 DAT)



Sharpen 2 fl oz + StrikeLock 12 fl oz (21 DAT)

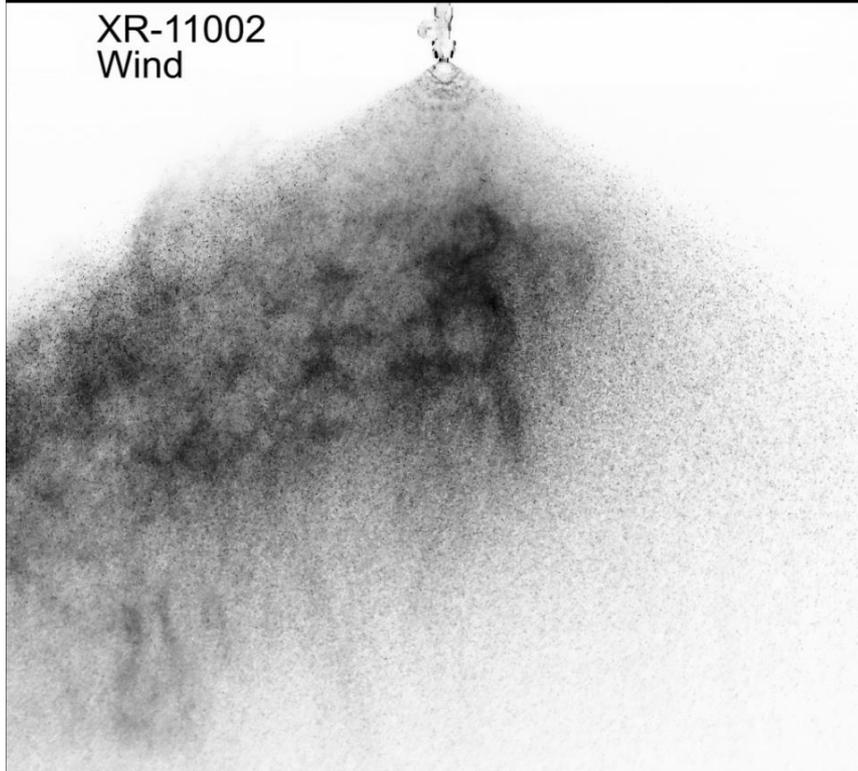
StrikeLock™

By WINFIELD

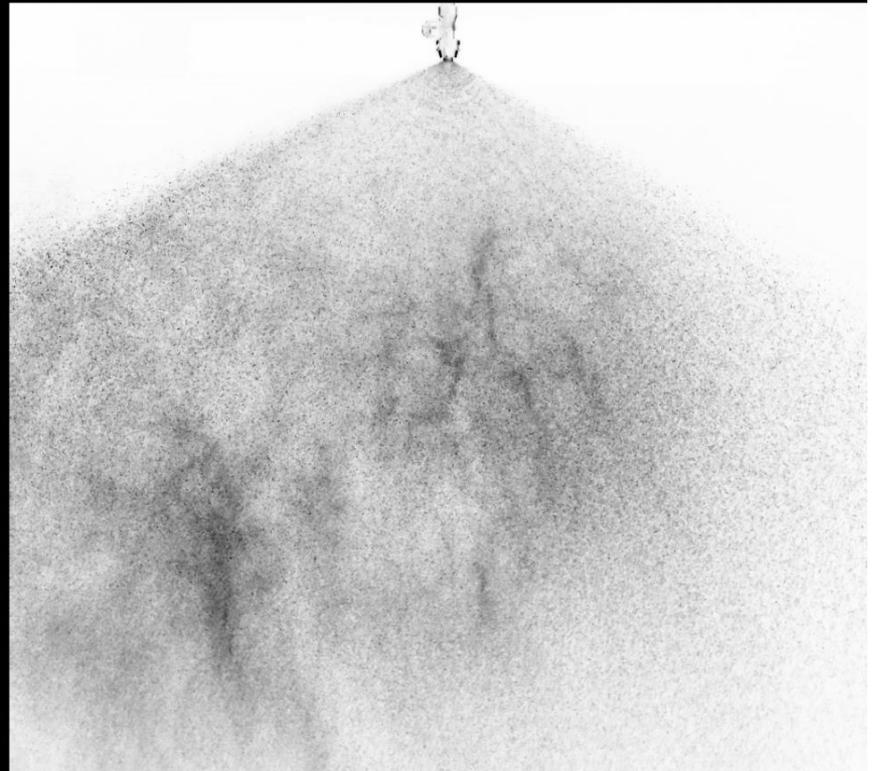
Adjuvant

HSOC-MSO
Drift/ Deposition

XR-11002
Wind



Water

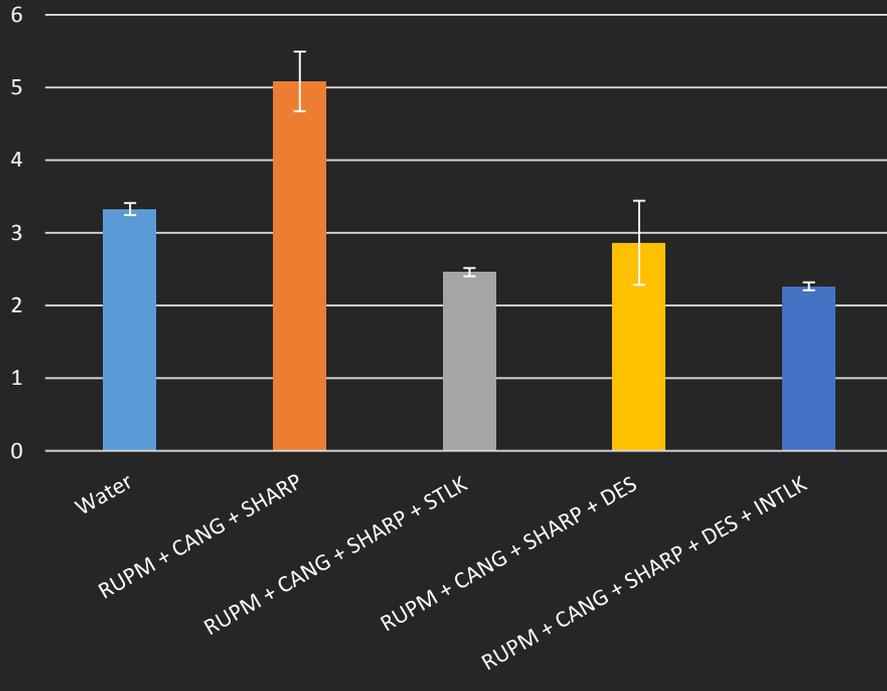


StrikeLock™

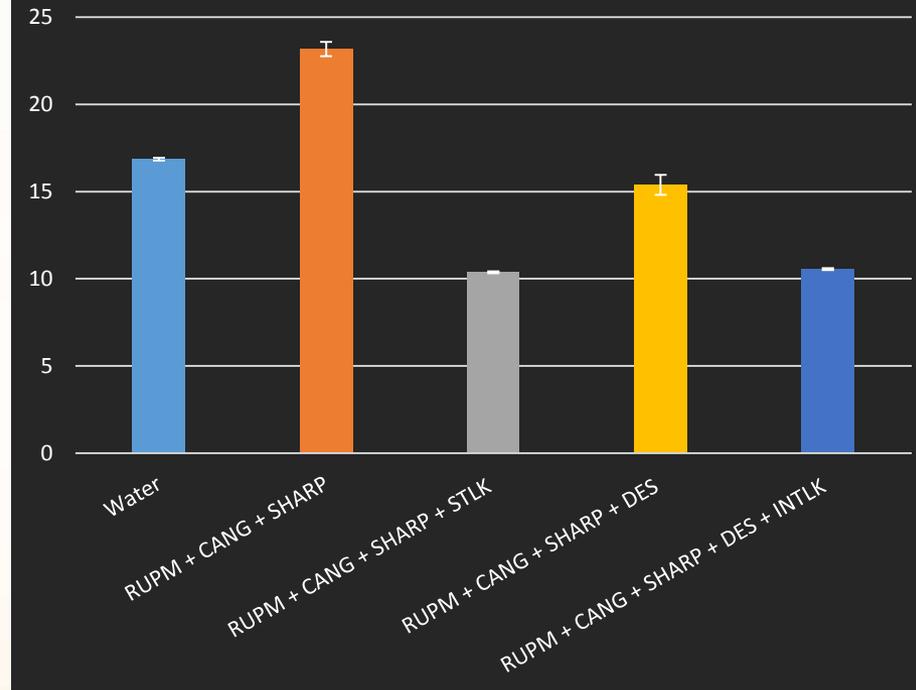
©2016 Winfield Solutions, LLC

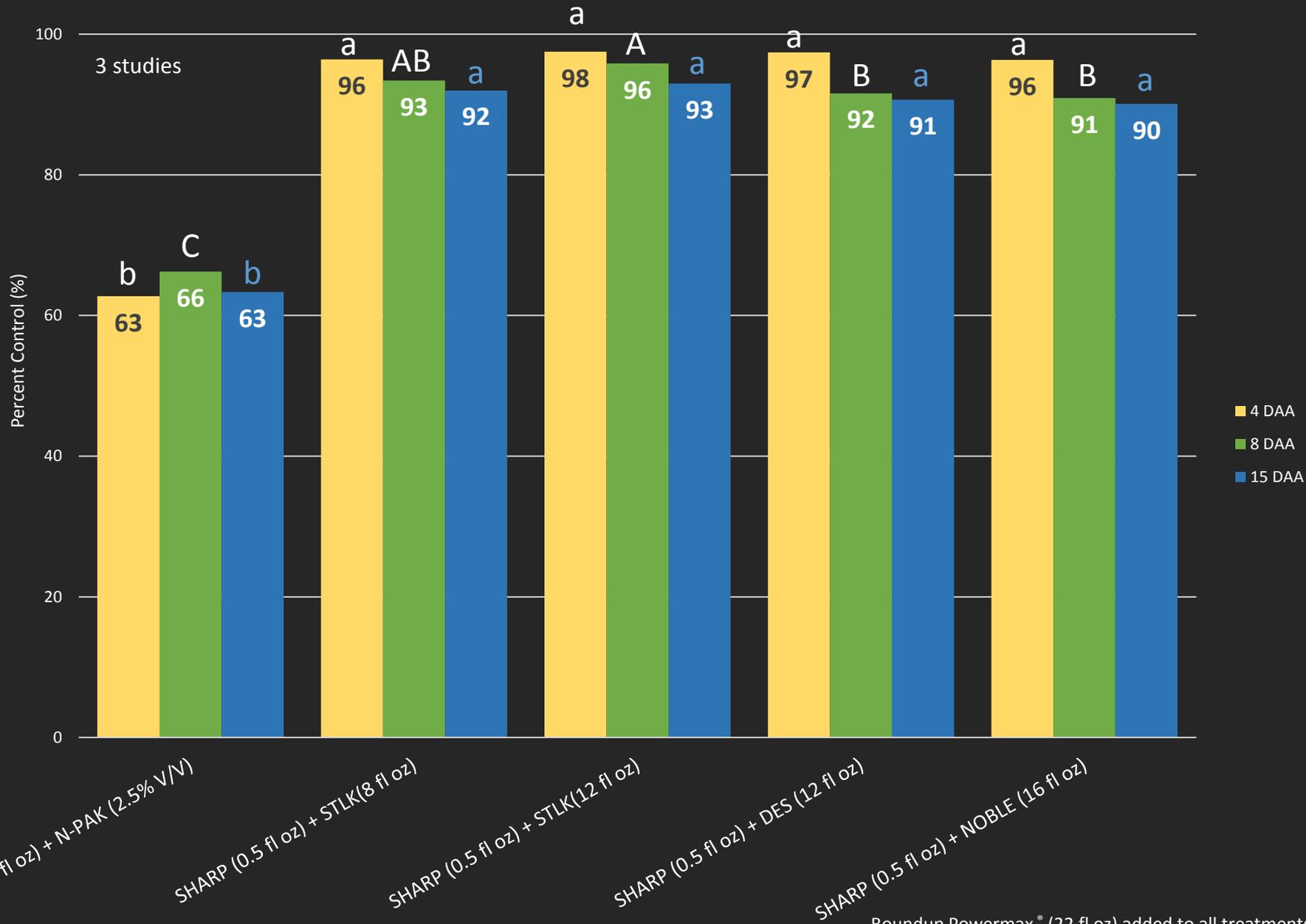
DRIFT MITIGATION SHARPEN®

Average % Fines <150µm: AIXR11006



Average % Fines < 150µm: XR11006





2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

FieldX Inc.
Hyatt Regency at the Arch
St. Louis, Missouri

FieldX Web-App

Abstract

Tim Welle

FieldX Inc., PO Box 91176, Raleigh, NC 27675

EVOLVING Technology

FieldX Inc. is launching a web-app as part of the FieldX suite of software. This web-app complements the FieldX apps currently available on the iPad, iPhone, and PC. It provides the ability for consultants to view and manage their data from any internet connected device.

The initial release will include the following set of features:

- **Manage picklists, including chemicals, varieties, weeds, insects, and diseases.**
- **Create and update templates for journal entries.**
- **Add new growers, farms, and fields.**
- **Create and edit field borders by tracing over online maps.**

This initial release will be available in January 2017.

FieldX Inc.
Hyatt Regency at the Arch
St. Louis, Missouri



FieldX[®] Software Platform

NAICC Emerging Technology Session
January 19, 2017

Tim Welle
Director of Business Development
FieldX Inc.



FieldX Overview

- Cloud based software platform
- Includes native apps for iPad, iPhone, and Windows
- Provides consultants and their growers the ability to collect, manage, and share field data.



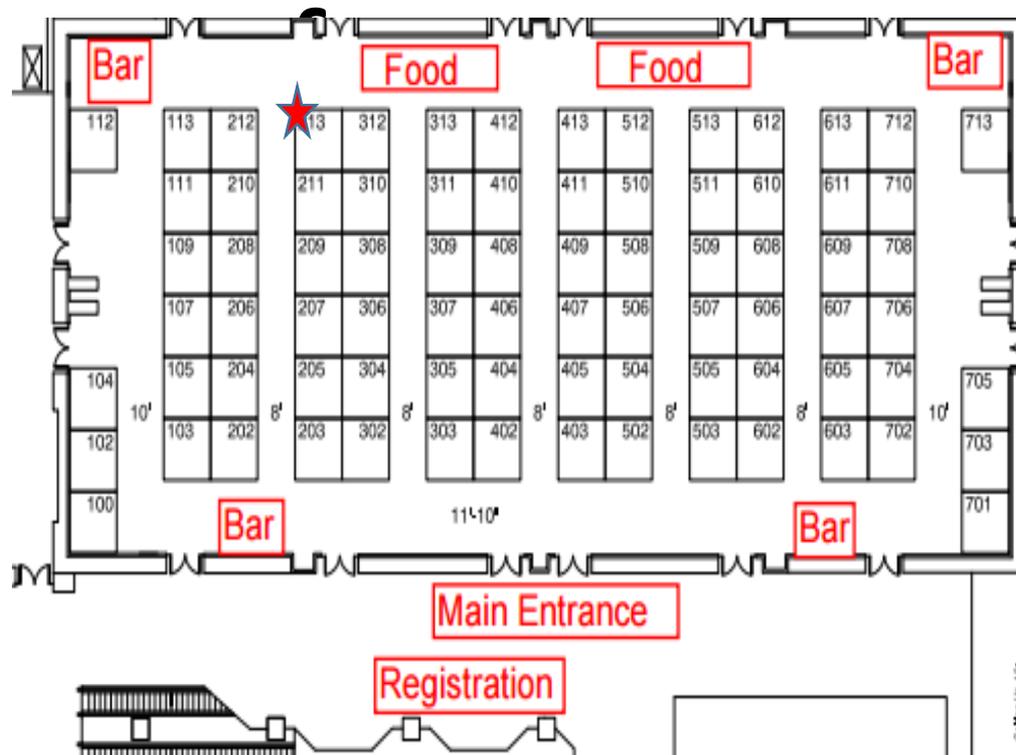
New for 2017- FieldX Dashboard

- A web-app that is part of the FieldX Platform
- Complements the current native FieldX apps
- Provides the ability to manage data from any internet-connected device, including smartphones and tablets
- Available in the first quarter of 2017



More Information

Stop by booth #213 for a demo



2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

Helena Chemical Company

**Hyatt Regency at the Arch
St. Louis, Missouri**

Three Improved Herbicide Formulations from Helena Chemical Company

Abstract

Michael C. Cox, Ph.D.

Helena Products Group, Helena Chemical Company, Memphis, TN 38120

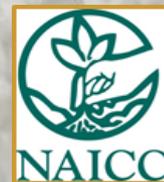
EVOLVING Technology

Herbicide resistance and off-target movement warrant the use of multiple tank-mix partners and improved product formulations. Helena Chemical Company recently launched three proprietary herbicides co-formulated with adjuvant systems that improve field and tank-mixing performance. Sinister is the free acid form of fomesafen used for pre- and postemergence weed control in soybeans, and contains an adjuvant package that enhances glyphosate performance as a tank-mixing partner. Antares is an enhanced liquid formulation of sulfentrazone used for preemergence weed control in soybean, sunflower, and other crops. Opti-DGA is an improved formulation of the diglycolamine salt of dicamba, labeled for spring preplant, summer fallow, and fall postharvest burndown of nuisance weeds commonly found to be resistant to glyphosate and PPO herbicides. All three herbicides have shown superior efficacy and compatibility with other herbicides and fertilizers in field and lab experiments.

Helena Chemical Company

Hyatt Regency at the Arch

St. Louis, Missouri





- 2.87 lb fomesafen acid; PPO Inhibitor; PRE & POST herbicide
- Similar chemistry –
 - ✓ Flexstar (Na salt fomesafen)
 - ✓ Reflex (Na salt fomesafen)
- Contains “in-can” adjuvant system, protected by HCC patent
- Enhanced leaf surface coverage, reduced evaporation
- Formulation designed to enhance glyphosate performance
- Improved tank-mixing compatibility with glyphosate and paraquat

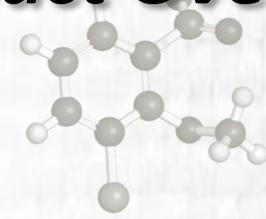
GROUP 14 HERBICIDE



- 4 lb DGA dicamba salt (CLARITY) based system; auxin mimic, POST herbicide
- Contains “in-can” adjuvant (OPTIMA), protected by HCC patent
- Contains a foam control system; low odor
- Preplant burndown & post-harvest weed control; **not for in-crop use**
- Similar chemistry –
 - ✓ Clarity (DGA salt dicamba)
 - ✓ Banvel (DMA salt dicamba)

GROUP 4 HERBICIDE

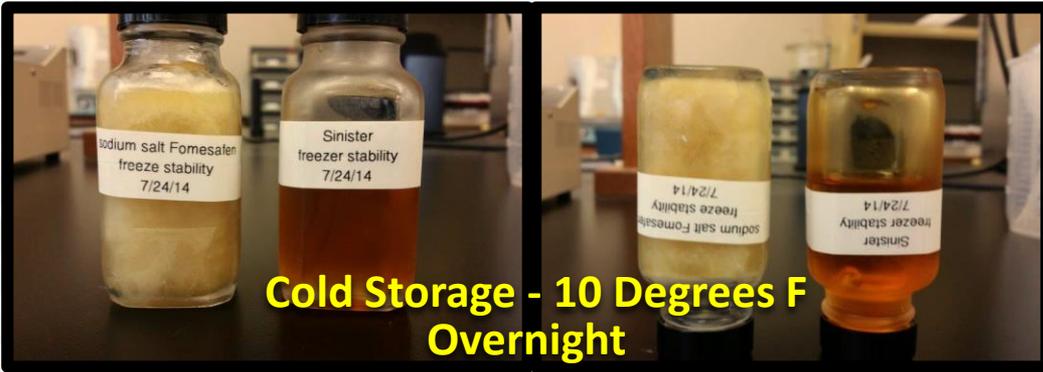
Product Overview



- 4 lb sulfentrazone; PPO Inhibitor; PRE & early POST herbicide
- Similar chemistry –
 - ✓ Aim (carfentrazone)
 - ✓ Sharpen (saflufenacil)
 - ✓ Valor (flumioxazin)
- Group 14 herbicides inhibit an enzyme involved in the synthesis of a precursor of chlorophyll (PROTOX inhibitor)
- Plant death results from destruction of cell membranes due to the formation of free radicals
- Improved soil wetting and percolation
- Enhanced glyphosate compatibility

GROUP 14 HERBICIDE





Cold Storage - 10 Degrees F Overnight

Storage Stability
Penetration/Absorption



Compatibility w/ K salt Glyphosate



Na salt Fomesafen Sinister
1 hr



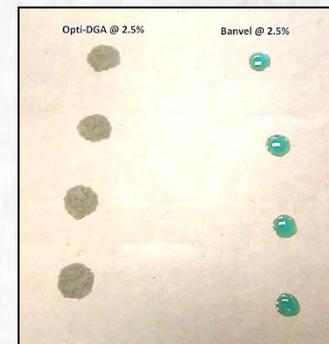
Na salt Fomesafen Sinister
Overnight



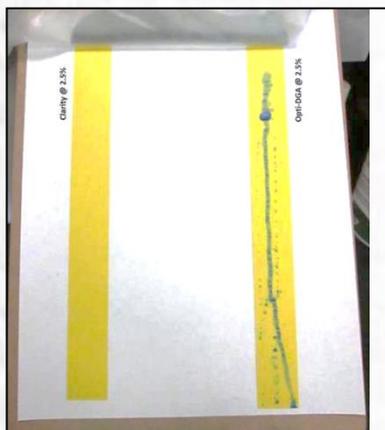
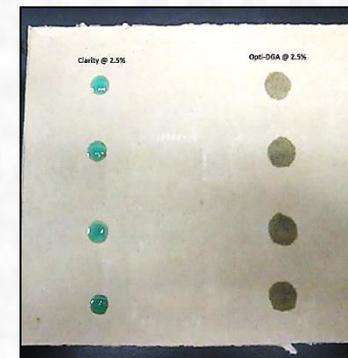
Product Features and Advantage Comparisons

Product	Active Ingredient Source	"Co-formulated" Adjuvant System	Rain Fastness Potential	Spreading And Wetting Performance	Glyphosate Absorption Agent	Water Hardness Compatibility
	pH Optimized Diglycolamine salts	Yes Co-formulated with wetting, spreading, and compatibility agents US Patent Protected	Two - Four Hours	Excellent Performance	Yes	Good Contains Compatibility Agents that prevent problems due to formation of insoluble salts
Dicamba - DGA	Diglycolamine Salts	No adjuvant capabilities	Four Hours Minimum	Poor No co-formulated adjuvant	No	Potential compatibility problems in hard water due to amine salts
Dicamba - DMA	Dimethylamine Salts	No adjuvant capabilities	Four Hours Minimum	Poor No co-formulated adjuvant	No	Potential compatibility problems in hard water due to amine salts

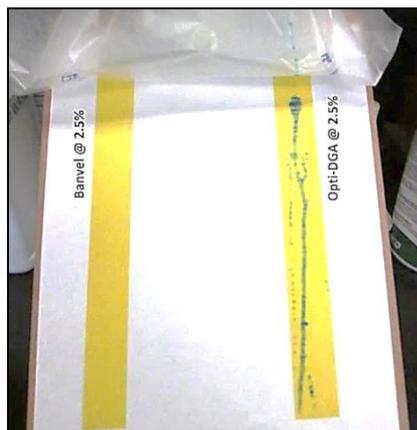
OPTI-DGA BANVEL



CLARITY OPTI-DGA



CLARITY OPTI-DGA

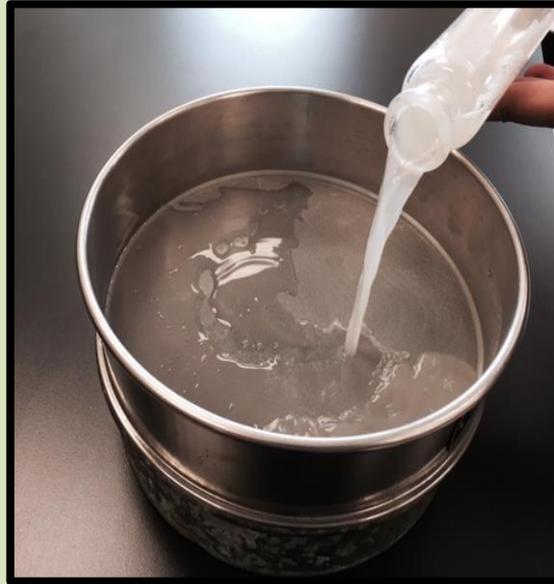


BANVEL OPTI-DGA

Tank-mixing Compatibility and Performance



**BLANKET + 4 other products
In 10 GPA tank-mix**



+ 4 other products in 10 GPA tank-mix



**Spray mix Infiltration through hydrophobic sand
Overnight**



Postemergent Activity – 24 HAT

24 hours



GENERIC 4 LB SULFENTRAZONE



Surface tension and contact angle for ANTARES and generic sulfentrazone are essentially identical. ANTARES, however, shows superior penetration through wax paper.



2017 Emerging and Evolving Technology Session



**National Alliance of
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Sentera

**Hyatt Regency at the Arch
St. Louis, Missouri**

Live NDVI Data in the Field

Abstract

Greg Emerick

Sentera, 6636 Cedar Ave South, Minneapolis, MN 55423

EMERGING Technology

Sentera's new LiveNDVI™ technology is not only an industry first, but the only solution available that allows users to live-stream UAV-captured TrueNDVI™ (normalized difference vegetation index) imagery while standing at the field edge, without an internet connection.

There is no faster way for consultants and growers to make informed decisions than to leverage live-streamed NDVI data. LiveNDVI technology translates near-infrared (NIR) data into understandable TrueNDVI imagery, on the sensor, while the UAV is in-flight.

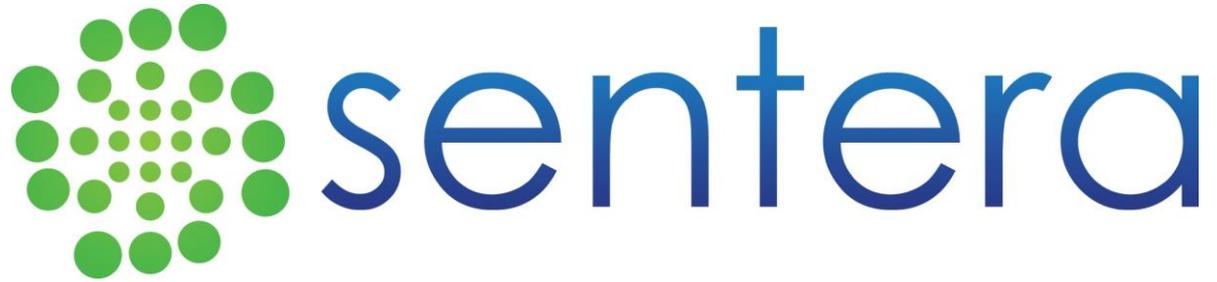
Sentera's LiveNDVI is the only solution, in the world, that offers real-time NDVI streaming.

LiveNDVI revolutionizes how decisions are made, recommendations are formulated, and relationships are developed.

Sentera

**Hyatt Regency at the Arch
St. Louis, Missouri**

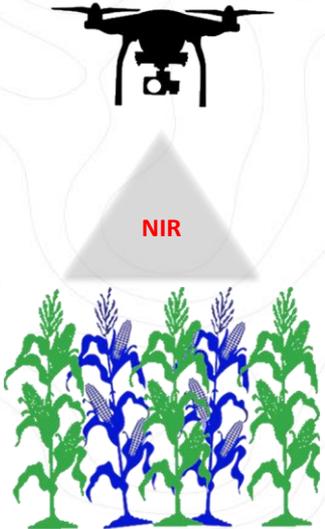




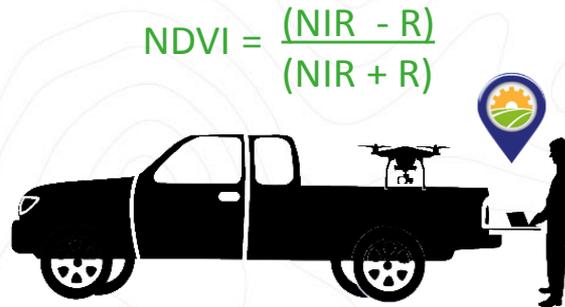
January 19, 2017

TRUE NDVI TODAY

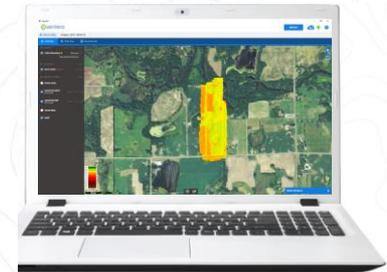
- 1 NIR Data captured in flight



- 2 NDVI calculated on the ground after landing UAV



- 3 View static NDVI maps & data



2017 IS A GAME CHANGING YEAR

1

- NIR Data captured in flight
- NDVI data calculated ON Double 4K sensor

2

- Process NDVI Data ON Sensor
In Real Time!
- 30 frames per second





2017 Emerging and Evolving Technology Session



**National Alliance of
Independent Crop Consultants**

ICL Specialty Fertilizers

**Hyatt Regency at the Arch
St. Louis, Missouri**

ICL Specialty Fertilizers – bringing innovative solutions to farmers

Abstract

Olena Castello, Ph.D.

ICLSF North America, 6581 South County Rd 250E, Greencastle, IN

ICL Specialty Fertilizers offers a range of specialty products that includes innovative technologies such as controlled release fertilizers and a leading range of solubles for the specialty agricultural market. ICL Specialty Fertilizers develops state-of-the-art specialty products. Our focus on innovation has driven us to develop the world's leading Controlled Release and Water Soluble Fertilizers use in Agriculture, Horticulture and Turf markets. The first market includes all growers of nursery stock and perennials in open fields and in pots and containers. The second encompasses all forms of specialty agriculture ranging from fruit to vegetables and arable crops. The third comprises all facilities that use turf, ranging from golf courses and sports fields to sod production and municipal landscaping.

ICL Specialty Fertilizers

Hyatt Regency at the Arch

St. Louis, Missouri

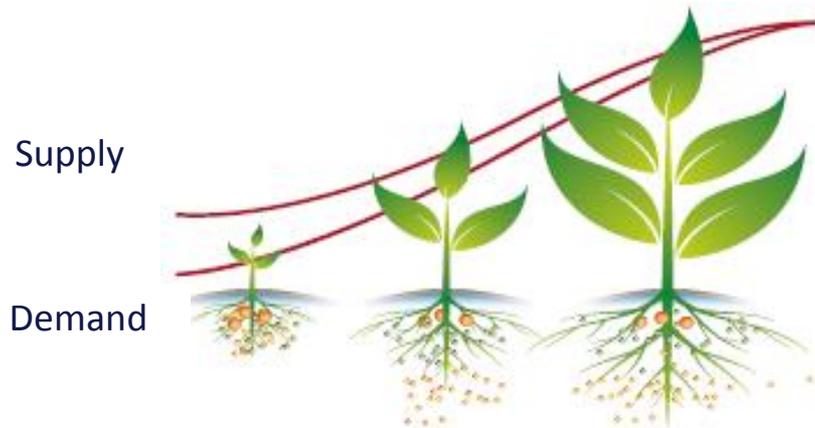


ICL Specialty Fertilizers develops state-of-the-art specialty products. Our focus on innovation has driven us to develop the world's leading **Controlled Release** and **Water Soluble Fertilizers** use in **Agriculture, Horticulture and Turf!**

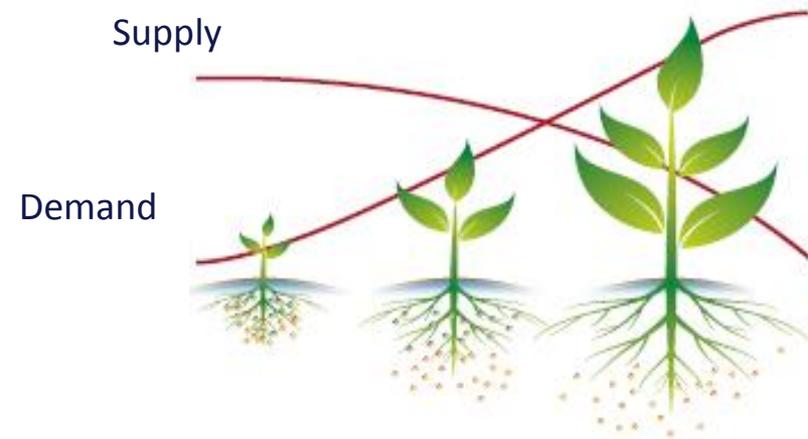


Olena Castello, Ph.D.
 Market Development & Technical Service Lead, U.S.

CRF Application



Soluble Fertilizer Application



Benefits of including CRF in crop nutrition programs

1. Increases nutrient use efficiency (N,P, K...+ micros)
2. Reduction of Nutrient losses to the environment
3. Prevention of nutrient fixation in the soil
4. Maintaining or increasing crop yield at reduced nutrient application rates
5. Eliminating multiple fertilizer applications
6. Environmentally friendly

Foliar Feed



Agroleaf[®]

Drip Feed



Agrolution[®]

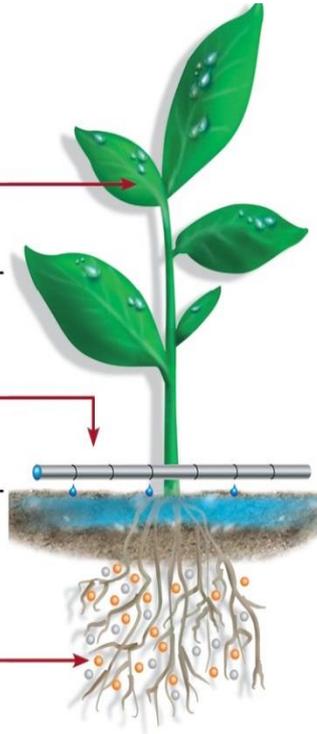
**Agrolution[®]
pHLow**

Controlled Release



**Agroblen[®]
Total**

Agrocote[®]



CONTROLLED RELEASE FERTILIZERS

Agroblen Total | **Agrocote** (E-MAX, Poly-S, Resin)

GRANULAR FERTILIZERS

Polysulphate (OMRI certified)

FOLIAR FEED

Agroleaf Booster | **Agroleaf Starter**

SPECIALTIES

H2Flo

DRIP FEED

Agrolution | **Agrolution pH Low**

PeKacid | **NovaMAP** | **Peak**

Short crop cycles (10-12 wks):

- Onion / Celery / Vegetables

Middle long crop cycles (13-17 wks):

- Strawberries
- Cotton / Tobacco
- Potato / Tomato
- Maize – Sweet & Pop Corn

Long crop cycles (18+wks)

- Raspberries / Blueberries
- Cranberries
- Sugar Cane
- Citrus
- Tree Nuts –Almonds / Pecans
- Fruit tree



1. Efficiency

- ✓ Improve nutrition delivery and efficiency

2. Economy

- ✓ Reduce fertilizer, labor and resource costs
- ✓ Generate more return on investment per season

3. Ecology

- ✓ Minimize nutrient loss due to leaching, volatilization and runoff

ICL SF APPROACH TO SUSTAINABILITY

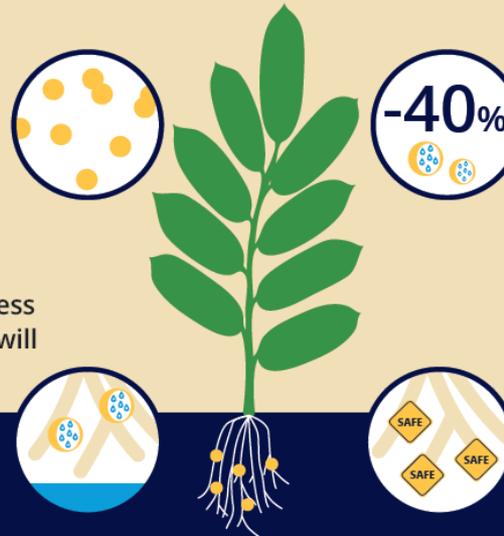


EFFICIENCY • ECONOMY • ECOLOGY

BENEFITS

Due to continuous nutrient release, stress periods of nutrient deficiencies are avoided

Due to the controlled release of nutrients, less leaching of nutrients will take place



Reductions of 40% of nutrients can be reached vs applications with conventional fertilizers

Due to the gradual release of nutrients, the EC of the soil solution is not affected

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IRAC

**Hyatt Regency at the Arch
St. Louis, Missouri**

Update on Bt Resistance in Corn Rootworm and Final EPA Stewardship Measures

Abstract

Sean Whipple, ISK Biosciences Corporation, representing IRAC-USA

The 2009 discovery of corn rootworm (CRW) resistance in Bt corn prompted EPA to initiate an assessment of this problem resulting in the 2014 release of a Draft Stewardship Framework to enhance current CRW resistance management and preserve Bt CRW technology. After considering comments from CRW experts, growers and agricultural groups, EPA released a refined CRW Resistance Management Framework for Bt corn in April 2016. Implementation and reporting requirements of this program are the obligation of CRW product registrants. This will require the cooperation of growers and consultants to incorporate effective management strategies and for detection of potential resistant populations. The program is built around educational outreach and requirements for Companies to investigate reports of unexpected damage and test to confirm resistance. In cases where resistance is confirmed Companies are required to implement mitigation strategies.

IRAC

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B.t. Corn Grower Education and Stewardship

- Agricultural Biotechnology Stewardship Technical Committee: Formed in 2000 to support and promote the stewardship and acceptance of plant-incorporated protectants (PIPs) and crops of modern biotechnology including proactive stewardship and development of industry practices and standards

Members: *B.t.* corn registrants or others with related responsibilities for insect resistance management

- Bayer CropScience
- Dow AgroSciences
- DuPont Pioneer
- Monsanto
- Syngenta



ABSTC Members Coordinate the Compliance Assurance Program (CAP)

The Compliance Assurance Program (CAP):

- Industry-coordinated compliance assurance activities for IRM associated with B.t. trait products in corn that require a structured refuge
- In addition to educational and promotional examples cited earlier, the CAP is comprised of two grower-focused components:
 - Anonymous Grower Survey
 - On-Farm Assessment for Refuge Compliance
- The grower survey provides information regarding grower adherence to refuge requirements and grower awareness of refuge requirements
- The On-Farm Assessments are conducted by 3rd parties and are intended to identify non-compliant growers and help bring them back into compliance

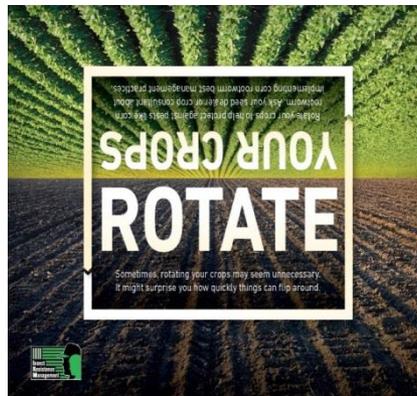


Key New IPM Stewardship Requirements for CRW

- Encourage a multi-year crop rotation strategy
 - Soybean/other non-host crop; pyramided trait products; alternative CRW modes of action; non-*B.t.* corn
- Guidance on soil-applied insecticides (SAIs)
 - SAIs not recommended with CRW *B.t.* traits for control of CRW except under limited circumstances
 - SAIs should only be used with non-CRW *B.t.* corn
 - SAIs should not be necessary for CRW control with pyramided CRW trait *B.t.* corn products
 - Consult with extension, crop consultants, or other local experts

Crop Rotation is Key to Successful CRW Management

- Rotation to a non-host crop (e.g., soybean) generally should be a component of long-term cropping systems
- Crop rotation is the primary option for managing CRW in fields with greater than expected CRW feeding damage
- Crop rotation mitigates any potential for actual *B.t.* resistance

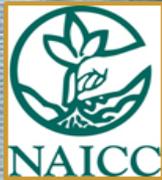


New Terms of CRW Registrations Maintain Flexibility for Growers

- Recommendations for crop planning, seed purchasing, and CRW management
- Strong emphasis on crop rotation as best management practice (BMP)
- Strong emphasis on reducing unnecessary use of soil-applied insecticides (SAI)
- Continue rapid transition to pyramided-trait products over time
- Continue emphasis on refuge compliance for resistance management
- **Stewardship of B.t. Corn is Critical for the Long-Term Durability of These Technologies**



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Thank You! The End!

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