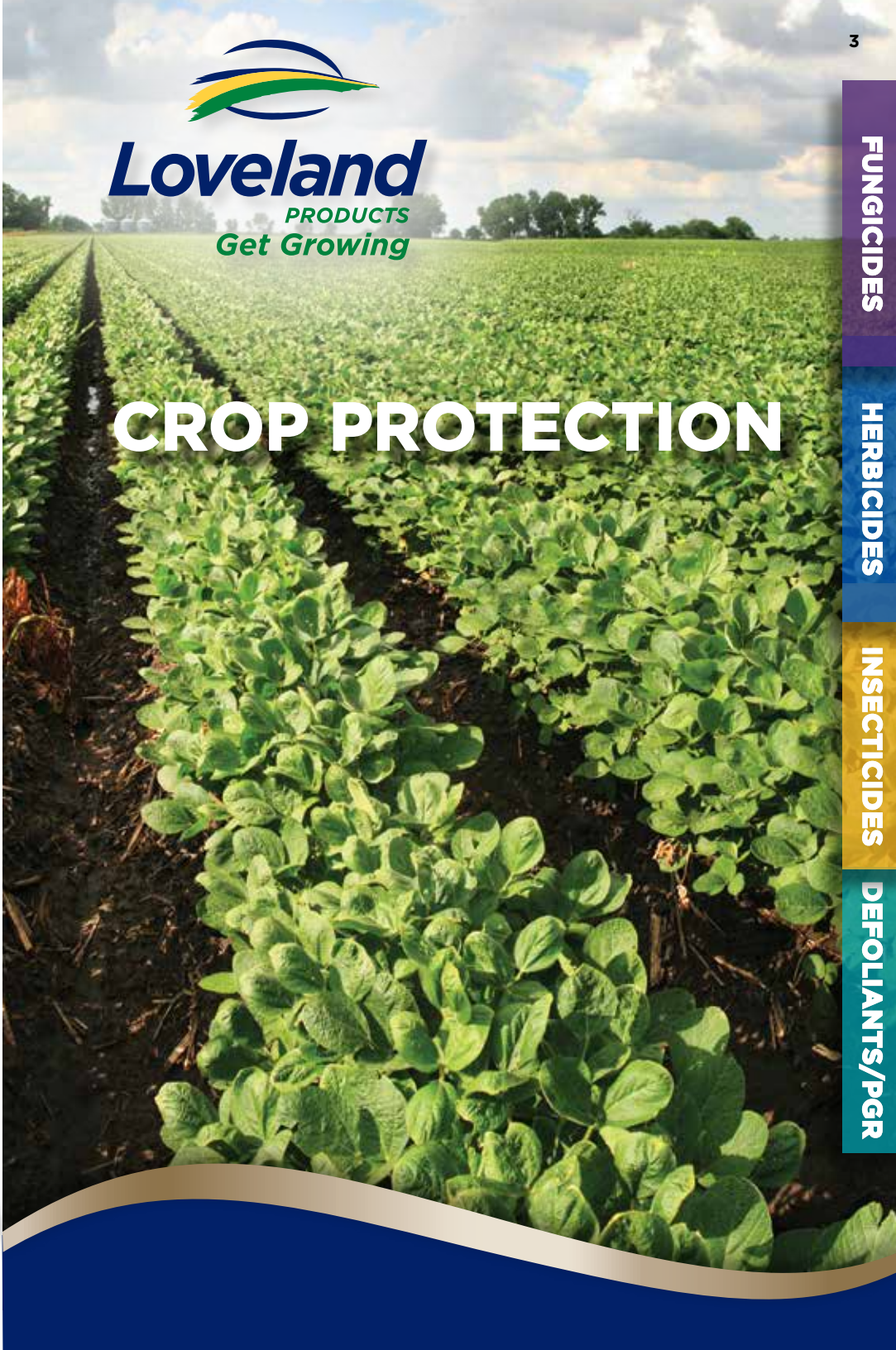


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# CROP PROTECTION

FUNGICIDES

HERBICIDES

INSECTICIDES

DEFOLIANTS/PGR

Group 3 Fungicide

# FITNESS<sup>®</sup>

## FUNGICIDE

### The Facts: A Two-Step Approach

**FITNESS<sup>®</sup>** fungicide is a proprietary propiconazole formulation that is designed specifically to provide broad spectrum disease control (both curative and preventative), minimize risk and enhance overall crop performance. Early application of **FITNESS** will help maximize the ability to have a healthy flag leaf. Flag leaf application will help maximize grain fill:

**Wheat:** 55% of grain fill is attributed to a healthy flag leaf

**Barley:** 65% of grain fill is attributed to a healthy flag leaf and penultimate leaf

#### FEATURES:

- Broad spectrum disease control
- Multi component surfactant system increasing penetration and uptake
- Proprietary stress reduction component
- Low use rate: easy to tank mix
- Can be applied by ground or air

#### KEY LEAF DISEASES CONTROLLED IN CEREALS:

Barley net blotch, Barley scald, Powdery mildew, Leaf and stem rust, Septoria leaf blight (See label for complete list.)

#### KEY LEAF DISEASES CONTROLLED IN CORN (FIELD CORN, SWEET CORN, POPCORN AND CORN GROWN FOR SEED):

Eye spot, Gray leaf spot, Leaf blights (northern and southern), Northern corn leaf spot (See label for complete list.)

**ACTIVE INGREDIENT:** Propiconazole

**ADJUVANT RECOMMENDATION:**  **Liberate<sup>®</sup>**

# FITNESS<sup>®</sup>

FUNGICIDE

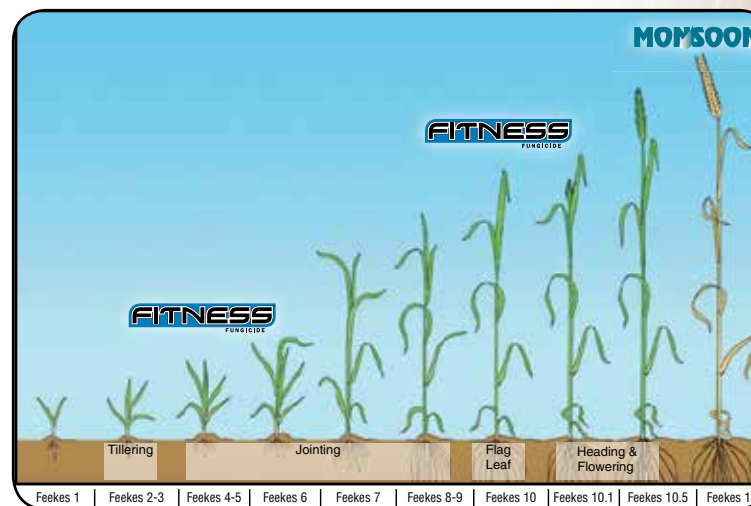
PROTECT YOUR CROP FROM DISEASE & HELP MINIMIZE CROP STRESS

#### APPLICATION RATE RANGES & TIMING

Feekes 2-6	2-4 oz/A during herbicide sprays
Feekes 10	4 oz/A at flag leaf timing
Rainfast	1 hour

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

#### SURVIVAL OF THE FITTEST



<b>TIMING:</b>	Herbicide Timing (Feekes 2-6)	Flag Leaf (Feekes 10) 50-70% emergence	Heading (10% lower; Feekes 10.51)
<b>PRODUCT:</b>	FITNESS	FITNESS	MONSOON <sup>®</sup>
<b>RATE:</b>	2 oz	4 oz	4 oz

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group M5 Fungicide

# INITIATE® :720

## FLOWABLE FUNGICIDE

**INITIATE®720** is a broad-spectrum protectant fungicide that controls a variety of foliar diseases in over 70 crops.

**FEATURES:**

- IPM compatible ..... Fits IPM program recommendations
- Multiple site mode of action ..... Minimizes incidence of disease resistance
- Broad spectrum ..... One product for multiple pathogens
- Long lasting control ..... Reduces number of sprays

**BENEFITS:**

**ACTIVE INGREDIENT:** Chlorothalonil

**APPLICATION RATE RANGE:** 1-4 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATION:**

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and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 3 Fungicide

# MONSOON®

**MONSOON®** fungicide provides both curative and preventative action offering effective broad spectrum disease control of many foliar diseases on over 20 crop groups.

**FEATURES:**

- Broad spectrum disease control
- Effective disease control on over 20 crop groups
- Compatible with most insecticides and herbicides
- Improved yield protection

**ACTIVE INGREDIENT:** Tebuconazole 38.7%

**APPLICATION RATE:** 4-8 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATION:****Stripe Rust**

<http://www.cnet.com/>

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and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 1,3 Fungicide

# PROTOCOL®

**PROTOCOL®** is a pre-mix of **two** proven fungicides that offers preventative and curative activity on leaf and stem diseases, especially effective on White mold in soybeans and peanuts.

## FEATURES:

- Unique formulation with ..... Proven disease control (both curative and preventative), resistance management strategy.
  1. Thiophanate-methyl
  2. Propiconazole
- White mold control ..... Controls White mold limiting yield losses

## BENEFITS:

**ACTIVE INGREDIENTS:** Thiophanate-methyl + Propiconazole

**APPLICATION RATE RANGE:** 1.25–3.75 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

## PROTOCOL RATE COMPARISON:

PROTOCOL Rate	Thiophanate-Methyl (Topspin® 4.5F)	Propiconazole (Tilt®)
1 pt	8 oz	3.02 oz
2 pt	16 oz	6.04 oz
3 pt	24 oz	9.08 oz

## ADJUVANT RECOMMENDATION:



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group M3 Fungicide

# ROPER® DF

## RAINSHIELD™

**ROPER® DF RAINSHIELD™** is a preventative fungicide that offers excellent disease protection for many agricultural crops. Its unique **RAINSHIELD Technology** sticks the active ingredient to the leaf surface of the plant which helps eliminate wash off from rainfall or irrigation.

## FEATURES:

- Superior disease control performance
- Excellent rainfastness
- Improved leaf coverage
- Ease of tank mixing
- Less dust
- Better dispersion in the spray tank
- Less spray tank residue

## KEY LEAF DISEASES CONTROLLED:

**Potato:** Late blight and Early blight

**Sugar beet:** Cercospora leaf spot

**Cereals:** Tan spot, Leaf spot, Leaf rust, Glume blotch

(See label for complete list.)

**ACTIVE INGREDIENT:** Mancozeb

**APPLICATION RATE RANGE:** 1-8 lbs/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

## ADJUVANT RECOMMENDATION:



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ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

**Group 11 Fungicide**



**SATORI**® is an enhanced formulation of Azoxystrobin which offers improved fungicide performance on multiple crops. **SATORI** contains **Leci-Tech® Technology** getting TO, ON & IN the plant, providing superior penetration of the leaf surface and greater uptake for improved performance.

**FEATURES:**

- Leci-Tech Technology getting TO, ON, & IN the plant
- Azoxystrobin fungicide
- Systemic activity
- Stay green affect

**BENEFITS:**

- Greater uptake for improved performance
- Broad spectrum disease control of the 4 main disease classes in many different crops
- Preventative and some curative disease control even to new growth
- Helps the crop utilize sunlight for improved yield potential

**APPLICATION RATE RANGE:**

Corn and soybean: 6.0-15.5 oz/A; Wheat: 4-12 oz/A  
 Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**CORN CROP RECOMMENDATION**

**V4 - V6 FUNGICIDE APPLICATION PROGRAM**

<b>Pre herbicide:</b>	For early season weed control
<b>Post herbicide:</b>	Makaze Yield Pro® + Satori at V4 - V6 crop stage
<b>Insecticide option:</b>	Tombstone™ Helios®

**ADJUVANT RECOMMENDATIONS:**



**CORN CROP RECOMMENDATION**

**R1 FUNGICIDE APPLICATION PROGRAM**

<b>Pre herbicide:</b>	For early season weed control
<b>Post herbicide:</b>	Makaze®
<b>Fungicide:</b>	Satori at R1 crop stage
<b>Insecticide option:</b>	Tombstone Helios



**SOYBEAN CROP RECOMMENDATION**

**R3 - R4 FUNGICIDE APPLICATION PROGRAM**

<b>Pre herbicide:</b>	Matador® or Intimidator®
<b>Post herbicide:</b>	Makaze Yield Pro or Makaze up to V5
<b>Fungicide:</b>	Satori at R3 - R4 crop stage
<b>Insecticide option:</b>	Swagger® or Tombstone Helios



**WHEAT CROP RECOMMENDATION**

**WHEAT FUNGICIDE APPLICATION PROGRAM**

<b>Herbicide:</b>	For early season weed control
<b>Fungicide:</b>	Satori application prior to Feekes 10.5
<b>Insecticide option:</b>	Tombstone Helios
<b>Tank mix partner:</b>	Fitness Fungicide



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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# CleanAMINE®

**CLEAN AMINE®** is a low odor, 4-pound Amine that delivers proven results across an extensive range of broadleaf weeds in a multitude of crops.

## FEATURES:

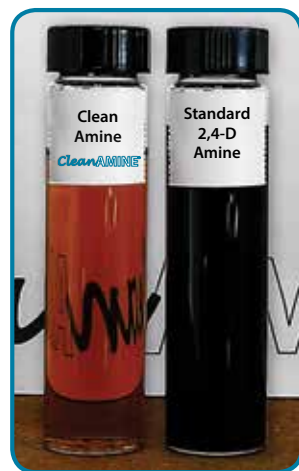
- Low odor formulation ..... Ideal for use in all labeled crops including sensitive odor areas
- Excellent compatibility ..... Reliability and flexibility of tank mixes with other pesticides
- Broad crop and ..... Convenience and versatility of non-crop label many uses

## BENEFITS:

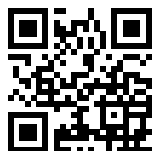
### APPLICATION RATE RANGE: 0.5–3 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

### ADJUVANT RECOMMENDATION:



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and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# COLT® + SALVO®

HERBICIDE

**COLT® + SALVO®** is a combination of **two** premium products that provide fast, effective control of many broadleaf weeds including Kochia and Russian thistle in small grain crops, fallow and burn down acres.

## FEATURES:

- Excellent control of Kochia and Russian thistle (controls or suppresses over 100 broadleaf weed species)
- Wide use window in crop (from 4 leaf to flag leaf emergence in wheat and barley)
- Multiple uses including burn down and fallow (resistance management option)
- Compatible with multiple products including glyphosate for burn down and grass herbicides for in-crop uses
- Rainfast within 1 hour after application

### ACTIVE INGREDIENTS: Fluroxypyr + 2,4-D Ester

### APPLICATION RATE RANGES: 1-2.67 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**APPLICATION TIMING:** From 4 leaf to flag leaf emergence in wheat and barley (do not use if underseeded with a legume).

### ADJUVANT RECOMMENDATION:



Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# COLT<sup>®</sup> + SWORD<sup>®</sup>

HERBICIDE

**COLT<sup>®</sup> + SWORD<sup>®</sup>** is a combination product offering convenient, economical, fast effective control of many broadleaf weeds including resistant Kochia in small grain crops, fallow and non-crop acres.

#### FEATURES:

- Wide use window in crop (from 3 leaf to flag leaf emergence in wheat, barley and oats)
- Multiple uses including fallow (resistance management option).
- Compatible with multiple products including grass herbicides for in crop uses
- Rainfast within 1 hour after application

**ACTIVE INGREDIENTS:** Fluroxypyr + MCPA

#### APPLICATION RATE RANGE:

1.125-2.75 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**APPLICATION TIMING:** From 3 leaf to flag leaf emergence in wheat, barley and oats (do not use if underseeded with a legume).

#### ADJUVANT RECOMMENDATION:



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with your mobile device  
for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# COLT<sup>®</sup> AS

HERBICIDE

**COLT AS<sup>®</sup>** is a combination product offering convenient, economical, fast, and effective control of many broadleaf weeds including resistant Kochia in small grain crops, corn and sweet corn, and non-crop acres.

#### FEATURES:

- Wide use window in crop (from 3 leaf to flag leaf emergence in wheat, barley and oats)
- Compatible with multiple products including grass herbicides for in crop uses
- Non ALS chemistry for herbicide resistance management
- Broad spectrum weed control, over 60 broadleaf weed species

**ACTIVE INGREDIENTS:** Fluroxypyr + Clopyralid

**APPLICATION TIMING:** From 3 leaf to flag leaf emergence in wheat, barley and oats (do not use if underseeded with a legume).

**APPLICATION RATE RANGE:** 1-2.66 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATION:** **LI 700<sup>®</sup>**

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for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.





**DOUBLE HEADER™** Corn Herbicide is a unique combination product delivering burndown & excellent residual activity on a broad spectrum of weeds long into the growing season. With tank mix compatibility to customize weed control, **DOUBLE HEADER** offers the flexibility of being applied both pre & post emergent.

**FEATURES:**

- Broad-Spectrum weed control ..... Providing corn the best possible weed free start
- Pre and Post Emergence ..... Convenient to suit different application timing (excellent crop safety) management programs
- Tank mix compatibility with ..... Provides flexibility to customize Atrazine, Glyphosate & other herbicides weed control
- 2 Active Ingredients ..... Management tool against resistant (Mesotrione & Acetochlor) weeds with 2 different Sites of Action

**ACTIVE INGREDIENTS:**

Mesotrione + Acetochlor

**PACK SIZES:** Totes & Bulk

**CROPS:** Field Corn, Sweet Corn, Field Seed Corn, Silage Corn, and Yellow Popcorn

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

**BENEFITS:****APPLICATION RATES:**

2 quarts/A

**ADJUVANT RECOMMENDATION:**

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



**DOG FIGHT™** is a 2 Active Ingredient combination herbicide for Roundup Ready® Soybeans. Delivering burndown on both grass and broadleaf weeds, along with the benefits of residual control, **DOG FIGHT** works hard to give Soybeans a flying start.

**FEATURES:**

- Burndown of Grass ..... Broad spectrum weed control & Broadleaf weeds
- Residual weed control ..... Managing early season yield robbing weeds
- 2 Active Ingredients ..... Different Site of Action Herbicides in one convenient formulation
- Can be applied for Burndown, ..... Application flexibility Preplant, or Postemergent

**ACTIVE INGREDIENTS:** Glyphosate + Imazethapyr

**PACK SIZES:** 2x2.5 gal, Totes, Bulk

**APPLICATION RATES:** 3 pints/A

**ADJUVANT RECOMMENDATION:**

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!





# HAT TRICK®

THREE WAY HERBICIDE

**HAT TRICK®** (three way herbicide) is a triple threat to cereal growers' toughest weeds for wheat, barley and oat crops. Combining **three** active ingredients, **HAT TRICK** attacks the toughest yield-robbing broadleaf weeds.

#### FEATURES:

- Broad spectrum weed control, over 105 broadleaf weed species controlled or suppressed
- Wide use window in crop (from 3 leaf to flag leaf emergence in wheat, barley and oats)
- Compatible with multiple products including grass herbicides for in-crop uses
- Non ALS chemistry for herbicide resistance management

#### ACTIVE INGREDIENTS:

Fluroxypyr + Clopyralid + MCPA

#### APPLICATION RATE RANGE: 1.5-2 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**APPLICATION TIMING :** From 3 leaf to flag leaf emergence in wheat, barley and oats (do not use if underseeded with a legume).

#### ADJUVANT RECOMMENDATION:



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!




# FORFEIT® 280

**FORFEIT® 280** non-selective herbicide provides fast control of both grass and broadleaf weeds (including weeds resistant to glyphosate and other herbicide classes) using a unique mode of action.

#### FEATURES:

- Unique mode of action controlling glyphosate, ALS and triazine resistant weeds
- Effective control of both grass and broadleaf weeds
- Ideal for weed resistance management programs
- Very compatible providing flexibility with tank mixes

#### ACTIVE INGREDIENTS:

Glufosinate

#### APPLICATION RATE RANGE:

15-82 fluid oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

#### ADJUVANT RECOMMENDATION:



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with your mobile device  
for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

**Group 1 Herbicide**

# Intensity one

POST-EMERGENCE GRASS HERBICIDE

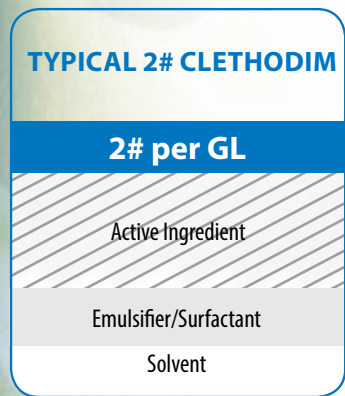


**INTENSITY® ONE** is a proprietary Clethodim which offers a quicker, more complete kill. **INTENSITY ONE** contains **Leci-Tech® Technology** getting TO, ON & IN the plant, providing improved cuticle and canopy penetration along with superior translocation and performance.

**FEATURES:**

- Leci-Tech Technology ..... The most complete kill getting TO, ON & IN the plant
- Better penetration of the ..... Wide application window and cuticle and canopy excellent rainfastness
- Better translocation ..... Faster uptake, performance, and reliability

**BENEFITS:**



Increased Penetration, Uptake, and Performance



**APPLICATION RATE RANGES:**

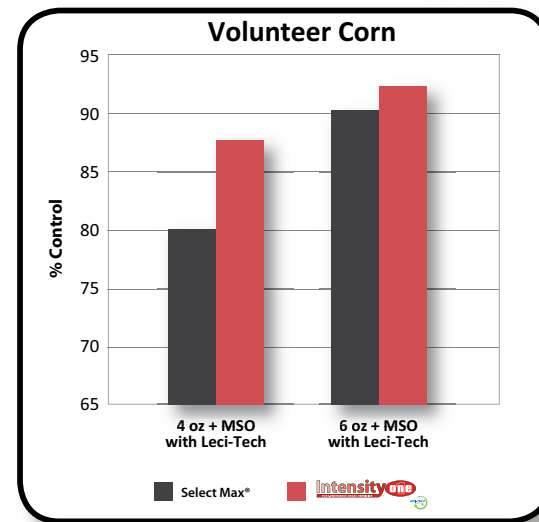
GRASS SPECIES	WEED HEIGHT <sup>†</sup> (inches)	RATES (fl . oz/acre)
Volunteer Corn	Up to 12	6 - 12
Volunteer Corn	Up to 24	9 - 14
Volunteer Corn	Up to 36	12 - 16

Refer to the label for specific crop and application rate.

\*\*Rates are for grass species of volunteer corn, including Roundup Ready®, LibertyLink® and IMI-Corn®.

†Weed Height generally occurs between 3-leaf stage and tillering.

\*Length of lateral growth.



Source: Grand Forks, ND

**ADJUVANT RECOMMENDATION:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# INTIMIDATOR®

Intimidator® for Soybeans.  
Put the brakes on weeds before they start.



**Intimidator gives weeds 3 reasons to be intimidated.**

It's a pre-emerge soybean herbicide with 3 modes of action. Intimidator provides both superior control of over 50 annual grasses and broadleaf weeds along with resistance management in one convenient product. Plus you get flexible application timing, one-pass convenience with your burn down program and more, all for greater soybean yield potential.

Ask your local Crop Production Services dealer about intimidating weeds this season.



Group 5,14,15 Herbicide

# INTIMIDATOR®

*"It's hotter than a goat's tail in a pepper patch"*

INTIMIDATOR® is a soybean pre-emerge herbicide with 3 actives for grass and broadleaf weed control. A management tool for resistant weeds with flexible application timing and compatibility for one pass convenience.

**FEATURES:**

- Unique formulation with ..... 3 active ingredients, 3 different modes of action, from 3 different chemical classes
  1. S-Metolachlor
  2. Metribuzin
  3. Fomesafen

**BENEFITS:**

- Broad spectrum weed control in one pass (both grass and broadleaf control)
- Burndown activity and ..... Providing the best possible start for the crop
- Moderate Fomesafen rate ..... Still able to apply Fomesafen post application

INTIMIDATOR Rate	Dual Magnum®	Metribuzin	Fomesafen	Additional Top Gun® post app
2.0 pt	0.88 pt	4.0 oz	.67 pt	12.0 oz
3.0 pt	1.33 pt	6.0 oz	1.00 pt	8.0 oz
4.0 pt	1.77 pt	8.0 oz	1.33 pt	2.5 oz

**ADJUVANT RECOMMENDATIONS:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 9 Herbicide

# MAKAZE®

HERBICIDE



**MAKAZE® is the most effective 4-pound premium glyphosate on the market today.**

**MAKAZE** contains **Leci-Tech® Technology** getting TO, ON & IN the plant, providing superior penetration into the leaf surface enabling greater uptake, translocation and rainfastness for a complete kill.

#### FEATURES:

- Leci-Tech Technology ..... The most complete kill getting TO, ON & IN the plant
- Superior leaf penetration ..... Greater uptake, excellent rainfastness
- Excellent crop safety on ..... Provides reliable performance all Roundup Ready® crops

#### BENEFITS:

**ACTIVE INGREDIENT:** Glyphosate

**APPLICATION RATE RANGE:** 32 oz/acre

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

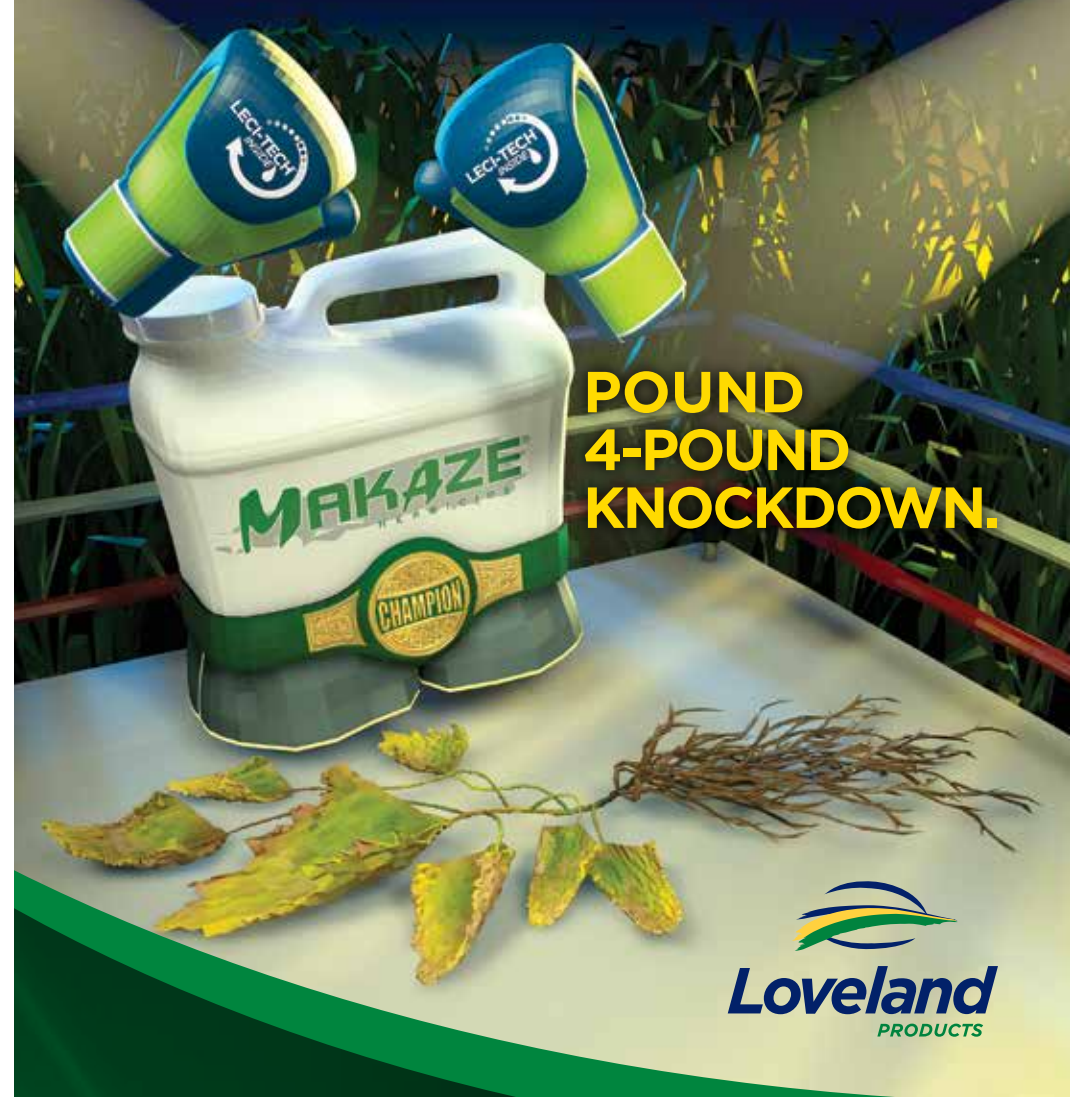
#### ADJUVANT RECOMMENDATIONS:



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and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.



**POUND  
4-POUND  
KNOCKDOWN.**

**Loveland**  
PRODUCTS

## Knock out your toughest weeds with the 4-pound champ.

Makaze® herbicide is simply the most effective 4-pound glyphosate on the market. Makaze contains exclusive Leci-Tech® technology which optimizes drift reduction, droplet retention and penetration — To, On and In the plant, resulting in faster uptake, even in harsh conditions. Makaze consistently out punches other glyphosates for a pound-4-pound knockdown.

Ask your Crop Production Services dealer about Makaze, or visit Loveland University at [www.lovelandproducts.com/LovelandUniversity](http://www.lovelandproducts.com/LovelandUniversity) to learn more.

Group 9 Herbicide



**MAKAZE YIELD PRO® is a standout performer when looking to maximize the yield of Roundup Ready® crops.**

MAKAZE YIELD PRO® provides all the knockdown benefits of MAKAZE® - the most effective 4-pound premium glyphosate on the market today - with the addition of plant health stimulants (IBA and kinetin), which provide the crop with the ability to increase root mass, plant vigor, and yield potential.

**ACTIVE INGREDIENTS:** Glyphosate + IBA + Kinetin

**APPLICATION RATE RANGE:** 32 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATIONS:** SOYBEAN FIELD; Vanceboro NC

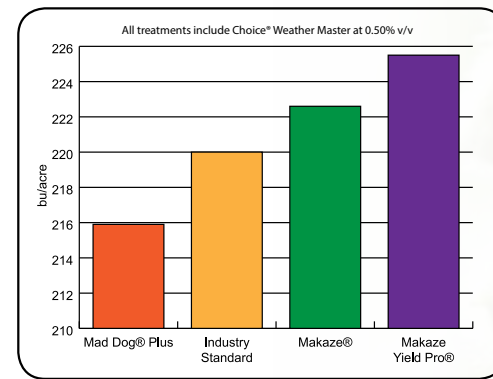


**FEATURES:**

- Leci-Tech Technology ..... A quicker more complete kill getting TO, ON & IN the plant
- Addition of plant health stimulants (IBA and Kinetin) ..... Increase root mass, plant vigor and yield potential
- Fastest uptake ..... Excellent rainfastness
- Excellent crop safety on ..... Provides reliable performance all Roundup Ready® crops

**BENEFITS:**

**CORN YIELDS**



Garvin, Illinois



**Plant Health Stimulants** are active ingredients that have a positive effect on plant health. They are typically applied in low quantities to mimic or enhance a plant's metabolism.

**Plant Health Stimulants** can include:

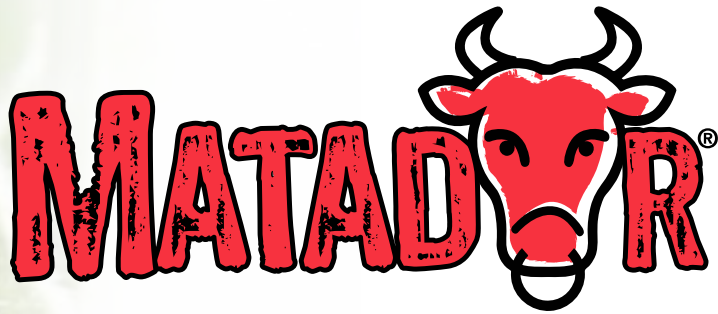
- Plant growth hormones
- Systemic acquired resistance (SAR)
- Amino acid complexes

Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 2,5,15 Herbicide



**“Mess with the Bull...Get the Horns”**

**MATADOR**® is a soybean pre-emerge herbicide that provides burndown and long lasting residual control of grass and broadleaf weeds. Developed to provide maximum weed control in combination with weed resistance management to combat glyphosate and ALS resistant weeds.

**FEATURES:**

- Unique formulation with ..... Broad spectrum weed control in one pass (both grass and broadleaf control) from 3 different chemical classes:
  1. Metolachlor
  2. Metribuzin
  3. Imazethapyr
- Burndown activity and ..... Providing the best possible start for the crop long lasting residual for the crop

**APPLICATION RATE RANGE:** 1.6-4.0 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ACTIVE INGREDIENTS PER APPLICATION RATE:**

MATADOR Rate	Metolachlor (Dual®)	Metribuzin	Imazethapyr (Pursuit®)
2 pt	1 pt	3 oz	2 oz
4 pt	2 pt	6 oz	4 oz



Montgomery, IN

**MATADOR on Broadleaves**

	Lambsquarters	Black Nightshade	Pigweed	Common Ragweed	Giant Ragweed	Smartweed	Velvetleaf	Marestail
Matador™	Excellent	Excellent	Excellent	Good	Fair	Excellent	Excellent	Good
Boundary®	Good	Fair	Excellent	Good	Fair	Excellent	Good	Good
Prefix®	Good	Excellent	Excellent	Good	Fair	Good	Poor	Fair
Canopy®	Excellent	None	Excellent	Good	Good	Excellent	Good	Good
Valor®	Good	Good	Good	Good	Fair	Fair	Fair	Good
Stealth®	Good	Poor	Fair	Poor	None	Poor	Fair	Poor
Trifluralin	Good	Fair	Good	Poor	None	Poor	None	-
Pursuit®	Good	Excellent	Excellent	Fair	Fair	Good	Good	Poor
Sencor®	Good	None	Excellent	Good	Fair	Excellent	Good	Good
Metolachlor	Poor	Fair	Good	Poor	None	Poor	None	Poor

**MATADOR on Grasses**

	Barnyardgrass	Crabgrass	Giant Foxtail	Green Foxtail	Yellow Foxtail	Fall Panicum	Witchgrass	Sandbur
Matador	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Poor
Boundary	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Poor
Prefix	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Poor
Canopy	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Poor
Valor	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor
Stealth	Good	Good	Good	Good	Good	Good	Good	Good
Trifluralin	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good
Pursuit	Fair	Fair	Good	Good	Good	Poor	Poor	Poor
Sencor	Poor	Fair	Good	Good	Good	Fair	Fair	Poor
Metolachlor	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Poor

**ADJUVANT RECOMMENDATIONS:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 2,5,15 Herbicide



**MATADOR-S** is a soybean pre-emerge herbicide that provides burndown and long lasting residual control of grass and broadleaf weeds. Developed to provide maximum weed control in combination with weed resistance management to combat glyphosate and ALS resistant weeds.

**FEATURES:**

- Unique formulation with ..... 3 active ingredients, 3 different modes of action, from 3 different chemical classes:
  1. S-Metolachlor
  2. Metribuzin
  3. Imazethapyr

**BENEFITS:**

- Burndown activity and ..... long lasting residual
  - A higher concentration ..... of activities
- Broad spectrum weed control in one pass (both grass and broadleaf control)
- Providing the best possible start for the crop
- Lower application rates compared to Matador

**ADJUVANT RECOMMENDATIONS:** 

**APPLICATION RATE RANGE:** 1.2-3 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.



MATADOR-S Rate	S-Metolachlor (Dual®)	Metribuzin	Imazethapyr (Pursuit®)
3 pt	1.33 pt	5.9 oz	3.94 oz

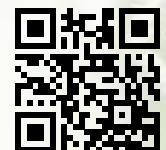


**What has changed?**

**MATADOR-S** combines S-Metolachlor (**MATADOR** uses straight Metolachlor) and a slightly higher concentration of Metribuzin and Imazethapyr. This allows **MATADOR-S** to have the same great performance at a slightly lower application rate. **MATADOR-S** is applied at 75% of the **MATADOR** application rate, with the maximum rate of **MATADOR** at 4 pts/A compared to the maximum rate of **MATADOR-S** at 3 pts/A.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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**Group 4 Herbicide**

**RIFLE®** is a broad spectrum herbicide that provides control of tough broadleaf weeds (including ALS resistant Waterhemp and Kochia) in multiple crops, fallow and non-crop acres.

**FEATURES:**

- Broad spectrum weed control, over 200 broadleaf weeds including many brush and vine species
- Multiple uses including fallow, pre or post emergence applications
- Flexibility with both ground and air applications
- Non ALS chemistry for herbicide resistance management
- Compatible with multiple products

**ACTIVE INGREDIENT:** Dicamba (DMA)

**APPLICATION RATE RANGE:** 8-16 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**APPLICATION TIMING:** Corn (up to 36 inches tall or 15 days before tassel), sorghum/Milo (3 leaf to 5 leaf), wheat (before 6 leaf), fall seeded barley (prior to Jointing), spring seeded barley (up to 4 leaf), oats (up to 5 leaf), sugarcane (before close in stage).

Refer to the label for specific timing recommendations per crop.

**ADJUVANT RECOMMENDATIONS:**



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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**Group 4 Herbicide**



**SABER®** is a 4-pound 2,4-D Amine formulation with a glycol base that keeps the active ingredient in soluble form longer, resisting evaporation and boosting uptake.

**FEATURES:**

- Glycol formulation ..... When applied to the leaf surface, **SABER** remains in a liquid form longer, allowing for greater uptake
- Less volatility ..... When compared to other 2,4-D Amine formulations, **SABER** proves to be less volatile and therefore more versatile
- Excellent compatibility ..... Flexibility and reliability and crop safety

**BENEFITS:**

**APPLICATION RATE RANGE:**

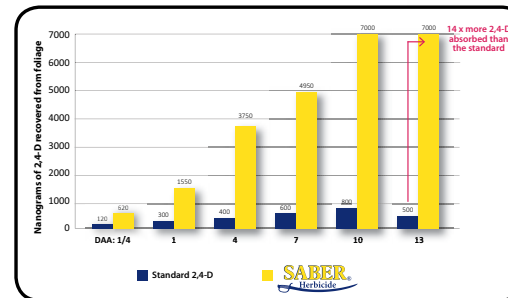
8-32 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATION:**



**Saber vs. Standard 2,4-D Absorption & translocation of 2,4-D in field bindweed**



USDA. IAREC. Prosser, WA.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code with your mobile device for instant Label/SDS and more!



# SALVO®

**SALVO®** is a premium 5-pound Ester with a unique emulsification blend and premium solvent system providing better uptake and control. The #1 selling 2,4-D by the largest ag retailer in the US.

**FEATURES:**

- A superior emulsion ..... Particularly important for created when **SALVO** is added to the spray tank performance and compatibility
- Smaller AI particle size ..... Better coverage, penetration, uptake, (not droplet size) than and performance other Esters
- Broad spectrum weed control ..... Versatility and reliability

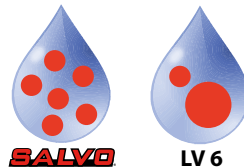
**BENEFITS:**

**APPLICATION RATE RANGE:** 6.4-12.8 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

Product	Avg Particle (Micelle Diameter Microns)	Number of Particles per volume (approx)
Salvo	5.89	5X
LV4	8.21	1.5X
LV6	9.66	1X

PARTICLE SIZE COMPARISON WITHIN THE DROPLET



- Improves penetration
- Improves uptake
- Improves performance

**ADJUVANT RECOMMENDATIONS:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# Sword®

**SWORD®** is a concentrated, premium methyl phenoxy Ester (MCPA) herbicide that controls a wide range of broadleaf weeds for small grains, flax, rangelands, pastures, turf and non-crop uses.

**FEATURES:**

- Concentrated formulation requiring less product per acre, reduced handling, and less storage
- Wide use window in crop (from 3 leaf to boot stage in wheat, barley and rye), allowing earlier application than other phenoxyes
- Compatible with many other herbicides, insecticides & nutritional products
- Rainfast within 1 hour after application
- Broad spectrum weed control, over 105 broadleaf weed species controlled or suppressed

**ACTIVE INGREDIENT:** MCPA

**APPLICATION RATE RANGE:** 0.33-1.0 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**APPLICATION TIMING :** Wheat, barley and rye (from 3 leaf to boot stage), oats (from fully tillered until pre boot).

**ADJUVANT RECOMMENDATION:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# TOP GUN<sup>®</sup> HERBICIDE

**TOP GUN<sup>®</sup>** is a pre and post emergence selective herbicide, offering fast, effective weed control along with long lasting residual control on difficult to control weeds in cotton, dry beans, snap beans, and soybeans.

**FEATURES:**

- Pre-emergence and post emergence control of glyphosate and ALS resistant Pigweed along with other troublesome weeds including Palmer amaranth, Waterhemp, Giant ragweed and Morningglory
- Acts quickly
- Excellent residual control
- Control or suppression of more than 50 weeds

**APPLICATION RATE RANGE:** 0.75-1.5 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ACTIVE INGREDIENT:** Fomesafen

**ADVANT RECOMMENDATION:**



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# WHITEOUT<sup>®</sup> 2,4-D

**WHITEOUT<sup>®</sup>** is a solventless 2,4-D Ester formulation that provides all of the performance and benefits of an Ester, with the volatility profile of an Amine.

**FEATURES:**

- Significantly reduced volatility
- More compatible with nutritional
- Low odor formulation

**BENEFITS:**

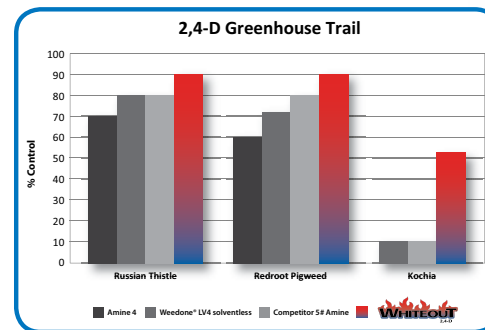
- Achieves the performance of an Ester while addressing volatility concerns
- The solventless formulation ensures more flexibility with tank mix options, especially nutritional
- Versatility including treating sensitive odor areas

**APPLICATION RATE RANGE:** 8-32 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

*"The best overall weed control was produced by WHITEOUT...it has virtually no smell and appears to be a high quality formulation of 2,4-D that readily mixes in water."*

- Dr. Phil Westra, Weed Researcher Colorado State University, 2009.



Colorado State University, 2009

**ADJUVANT RECOMMENDATION:**



Scan QR code with your mobile device for instant Label/SDS and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# ANARCHY

**ANARCHY** insecticide controls a broad spectrum of sucking & chewing pests across a wide range of crops. Delivering rapid knockdown control by contact or ingestion, **ANARCHY** provides effective control on all insect growth stages.

## FEATURES:

- Control by contact or ingestion.....Multiple control options providing ideal crop defense
- Translaminar properties.....Excellent residual activity on foliar feeding insects
- Rapid knockdown.....Pest damage minimized

## BENEFITS:

**ACTIVE INGREDIENT:** Acetamiprid

**FORMULATION:** Conveniently offered in two formulations, a 70WP Insecticide and 30SG Insecticide

## PACK SIZES:

**ANARCHY**  
70WP

4 x 28oz Jug (112oz / case)

**ANARCHY**  
30SG

4 x 4 lb Jug (256oz / case)

## APPLICATION RATES:

Anarchy 70 WP : 0.6 – 5.7 oz/A  
Anarchy 30 SG : 1.5 – 13.3 oz/A

## ADJUVANT RECOMMENDATIONS:



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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and more!



**WARHAWK**  
ClearForm

**REAPER**  
ClearForm

# ClearForm®

**CLEARFORM®** is a unique formulation developed by Loveland Products which provides high performance with Low VOC (Volatility Organic Compound) characteristics. Unlike many other Low VOC formulations in the market which are water based and have struggled with penetration and uptake, the **CLEARFORM** formulations are solvent based maintaining excellent performance while meeting Low VOC regulations.

## FEATURES:

- Low VOC formulation ..... Meets low VOC requirements
- Solvent based ..... Excellent field performance (not water based)
- Standard AI rates ..... No need to lower or adjust rates to meet the VOC requirements (Active Ingredient)

## BENEFITS:

**What are Volatile Organic Compounds (VOCs):** VOCs are gases that can combine with other substances in the air to form ground-level ozone (smog). As part of the Clean Air Act, the EPA has set limits for ozone.

## APPLICATION RATE RANGE:

**REAPER® CLEARFORM** : 4-20 oz/A

**WARHAWK® CLEARFORM** : 0.5-2 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

## ADJUVANT RECOMMENDATION:



Reaper Clearform and Warhawk Clearform are Restricted Use Pesticides  
ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



# Match-Up®

## INSECTICIDE

**MATCH-UP®** is a premix insecticide of **two** high performing active ingredients providing **two** true modes of action – delivering quick control and extended residual across a wide range of insect pests on many different crops including corn, soybeans, and cotton.

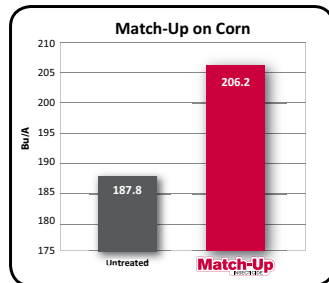
### FEATURES:

- Two active ingredients ..... Two modes of action providing (Chlorpyrifos and Bifenthrin) broad spectrum insect control across many crops
- Fast knockdown ..... Minimizing pest damage
- Delivers extended residual ..... Longer period of insect control

### BENEFITS:

### ACTIVE INGREDIENTS PER APPLICATION RATE:

MATCH-UP Rate	Equivalent Warhawk® Rate	Equivalent Sniper® Rate
1.0 oz	0.6 oz	0.4 oz
5.5 oz	3.4 oz	2.2 oz
8.0 oz	4.9 oz	3.2 oz
16.4 oz	10.1 oz	6.4 oz



Diamond Ag Stafford, KS, 2013

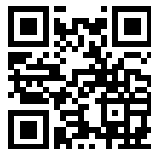
### ADJUVANT RECOMMENDATION:



Match-Up is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



# SNIPER®

**SNIPER®** is a highly effective insecticide/miticide that controls over 30 foliar and soil borne pests. **SNIPER** gives growers the flexibility and residual needed to combat insects in conventional or biotech systems.

### FEATURES:

- Broad spectrum
- Excellent knockdown
- Long residual

### KEY INSECTS CONTROLLED:

Armyworm, Black cutworm, Boll weevil, Grasshoppers, Plant bugs, Stalk borer, Stink bugs, Thrips, Western bean cutworm  
(See label for complete list.)

### APPLICATION RATE RANGE: 1.3-6.4 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

### ACTIVE INGREDIENT: Bifenthrin

### ADJUVANT RECOMMENDATIONS:



Sniper is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



Group 3 Insecticide

# SNIPER<sup>®</sup> LFR<sup>®</sup>

**SNIPER<sup>®</sup> LFR<sup>®</sup>** is an insecticide applied at planting, providing a zone of protection that controls pests before seed or seedling damage ever takes place. **SNIPER LFR** (Liquid Fertilizer Ready technology) has excellent liquid starter fertilizer compatibility enabling an efficient one trip through the field. One pass to plant, fertilize, and protect the seed for a healthier plant stand leading to an increase in yield potential.

## FEATURES:

- Bifenthrin: ..... Controls seed and seedling pests such as Wireworm, Cutworm, Grubs, Rootworm, Armyworm, Seedcorn maggot and Common stalk borer
- Long residual ..... Protects roots and seed
- (LFR) ..... Excellent liquid fertilizer compatibility and mixing properties
- Liquid Fertilizer Ready

## BENEFITS:

## APPLICATION RATE RANGE: 3.4-17 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

## ADJUVANT RECOMMENDATIONS:



Sniper LFR is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.



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for instant Label/SDS  
and more!



Group 3A Insecticide

# SNIPER<sup>®</sup> HELIOS<sup>®</sup>

**SNIPER<sup>®</sup> HELIOS<sup>®</sup>** is a premium insecticide/miticide that controls over 30 foliar and soil pests with extended performance over standard Bifenthrin formulations. **Helios** is a unique technology that protects the AI by providing the ultimate protection from UV exposure, extending performance in the field.

## FEATURES:

- Helios Technology ..... Provides UV protection to the active allowing more time to get the job done
- Broad Spectrum ..... Controls over 30 chewing, sucking and flying pests
- Easy to handle formulation ..... Flexible tank mix partner

## BENEFITS:

## ACTIVE INGREDIENT

Bifenthrin

## APPLICATION RATE RANGE: 2.1-6.4 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

## ADJUVANT RECOMMENDATIONS:



Sniper Helios is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Scan QR code  
with your mobile device  
for instant Label/SDS  
and more!



Group 3,4A Insecticide

# SWAGGER®

SWAGGER® is a unique combination insecticide blending the fast knockdown of Bifenthrin and the long lasting residual of Imidacloprid across multiple crops.

**FEATURES:**

- Two active ingredients: ..... Bifenthrin and Imidacloprid
- Fast knockdown ..... Pest damage minimized
- Delivers extended residual ..... Longer period of insect control
- Unique formulation ..... Providing excellent compatibility, flexibility of tank mixes, and storage stability

**BENEFITS:**

- Two modes of action: providing broad spectrum insect control across many crops
- Pest damage minimized
- Longer period of insect control
- Providing excellent compatibility, flexibility of tank mixes, and storage stability

**APPLICATION RATE RANGE:** 7.6-25.6 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATIONS:**



**Formulation Technology**



Scan QR code with your mobile device for instant Label/SDS and more!



Swagger is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Group 3A Insecticide

# TOMBSTONE™ HELIOS®

INSECTICIDE

TOMBSTONE™ HELIOS® is an enhanced Synthetic Pyrethroid (Cyfluthrin) with extended performance over many other insecticides. Helios is a unique technology that protects the AI by providing the ultimate protection from UV exposure, extending performance in the field.

**FEATURES:**

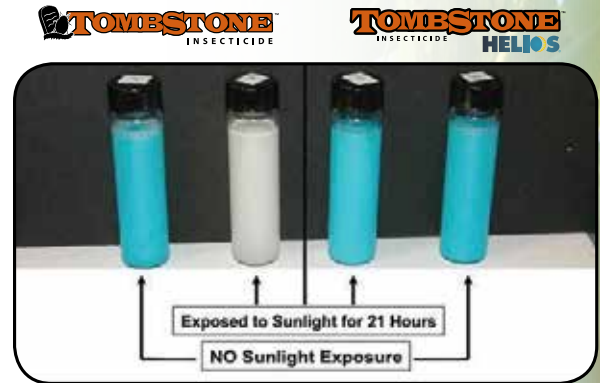
- Helios Technology ..... Provides UV protection to the active allowing more time to get the job done
- Sustained insecticide ..... Longer period of insect control performance
- Excellent compatibility ..... Versatility and reliability and crop safety

**BENEFITS:**

- Provides UV protection to the active allowing more time to get the job done
- Longer period of insect control performance
- Versatility and reliability and crop safety

**APPLICATION RATE RANGE:** 0.8-3.2 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.



**ADJUVANT RECOMMENDATION:**



Tombstone Helios is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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INSECTICIDES

INSECTICIDES

# WARHAWK®

**WARHAWK®** is a broad spectrum insecticide that provides consistent protection against some of the most damaging insect pests in more than 50 crops.

## FEATURES:

- Application flexibility ..... Can be soil or foliar applied by ground or air
- Tank mix flexibility ..... Can be tank mixed with many pesticides and fertilizers to reduce number of field passes
- Broad spectrum ..... Over 50 crops and over 140 insects labeled
- Wide window of application ..... Allows application during economic threshold
- Consistent performance ..... Warhawk kills insects through contact and/or ingestion and the temporary vapor produced can reach susceptible insects where spray droplets can't

**ACTIVE INGREDIENT:** Chlorpyrifos

**APPLICATION RATE RANGE:** 0.5-2.0 pts/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATION:**  **LI 700®**

Warhawk is a Restricted Use Pesticide

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

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and more!



# Wrangler®

## INSECTICIDE

**WRANGLER®** is an effective residual insecticide with excellent knockdown that controls a host of sucking and piercing pests in cotton such as Plant bugs, Cotton aphids and Stink bugs.

## FEATURES:

- Resistance management tool ..... Controls many insects that show resistance to other insecticides
- Selective activity ..... Maintains population of beneficials while controlling yield robbing pests
- IPM friendly ..... 12 hour REI and non-restricted use pesticide

## BENEFITS:

**ACTIVE INGREDIENT:** Imidacloprid

**APPLICATION RATE RANGE:** 1.5-16.0 oz/A

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

**ADJUVANT RECOMMENDATIONS:**



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and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.



# DFT 6 EC

**DFT 6 EC** is an important component of any cotton harvest aid program due to its superior performance on mature leaf drop, providing a fast, efficient, and flexible cotton defoliation.

## FEATURES:

- Herbicidal defoliant that causes leaf injury resulting in ethylene synthesis and leaf drop
- Excels at mature leaf drop
- Mostly applied in a tank mix with products containing Thidiazuron and/or Ethephon for increased activity on juvenile leaves as well as to enhance boll opening and control regrowth
- Rainfast one hour after application

**ACTIVE INGREDIENT:** Tribufos

## APPLICATION RATE RANGE:

Generally 4-12 oz/A (depending on tank-mix partners and temperature; use higher rates as temperatures decrease)

*Consult the Mid-South Cotton defoliation charts on the following page for rate selection (based on university recommendations from AR, MS and TN).*

**SPRAY VOLUME:** Ground @ 10-20 GPA, Aerial @ 5-10 GPA.

## ADJUVANT RECOMMENDATIONS:



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

# DFT 6

SCENARIO 1			
Temps	Regrowth Potential	Boll Opening Needed	Regrowth Potential
Warm	High	Yes	One
One Pass			
DFT 6 EC @ 4 to 6 oz/ac + Takedown® (TDZ) @ 2 to 3 oz/ac + Boll Buster® (Ethephon) @ 21 oz/ac			

SCENARIO 2			
Temps	Regrowth Potential	Boll Opening Needed	Regrowth Potential
Warm	High	Yes	Two
First Pass		Second Pass	
DFT 6 EC @ 4 to 6 oz/ac + Takedown @ 1.6 oz/ac + Boll Buster @ 8 oz/ac		DFT 6 EC @ 1 pt/ac + Boll Buster @ 32 oz/ac	
DFT 6 EC @ 4 to 6 oz/ac + Takedown @ 2 to 3 oz/ac		DFT 6 EC @ 8 to 10 oz/ac + Boll Buster @ 26 to 32 oz/ac	

SCENARIO 3			
Temps	Regrowth Potential	Boll Opening Needed	Number of Passes
Cool	Low	Yes	Two
First Pass		Second Pass	
DFT 6 EC @ 10 to 16 oz/ac + Boll Buster @ 32 to 40 oz/ac		DFT 6 EC @ 12 to 16 oz/ac + Boll Buster @ 32 to 40 oz/ac	

SCENARIO 4*			
Temps	Regrowth Potential	Boll Opening Needed	Number of Passes
Cool	Low	No	Two
First Pass		Second Pass	
DFT 6 EC @ 10 to 16 oz/ac		DFT 6 EC @ 10 to 16 oz/ac	

\*Do not apply more than 24 oz/A of DFT 6 per season.

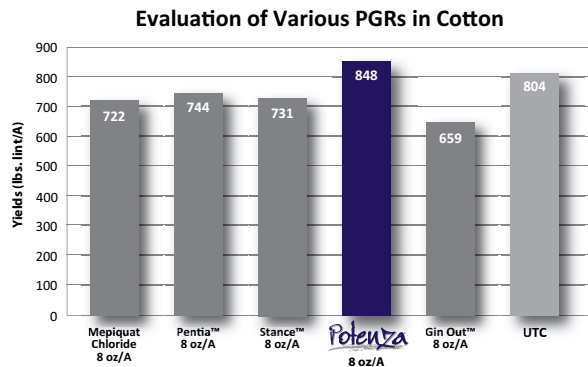
Scan QR code with your mobile device for instant Label/SDS and more!



# Potenza®

**POTENZA®** delivers cotton growers the benefits of regulating vegetative growth with Mepiquat, with the addition of Plant Health Stimulants providing an increase in boll set and boll retention.

- **Mepiquat (PGR):** Inhibits cell elongation, moderates vegetative growth, redirects resources
- **IBA (PGH) + Kinetin (PGH):** Both Plant Health Stimulants that assist with promoting root formation, translocation of nutrients, increased fruit formation and retention. Stimulates synthesis and accumulation of chlorophyll and leaf expansion, promotes cell division, growth of lateral buds, and improved response to water stress



Source: T. Horn, Stoneville R&D, Mississippi, 2006.  
Variety = DeltaPine 117  
Application Timing: pinhead square followed by first bloom

**ACTIVE INGREDIENTS:** Mepiquat Chloride + IBA + Kinetin

# Potenza

### APPLICATION RATE RANGES:

Cotton variety with medium vegetative vigor: 2-16 oz/A

Cotton variety with high vegetative vigor: 4-24 oz/A

See label for specific instructions.

### ADJUVANT RECOMMENDATION:



**Plant Health Stimulants** are active ingredients that have a positive effect on plant health. They are typically applied in low quantities to mimic or enhance a plant's metabolism. .

**Plant Health Stimulants** can include:

- Plant growth hormones
- Systemic acquired resistance (SAR)
- Amino acid complexes

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for instant Label/SDS  
and more!



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Awaken® ST nutritional seed treatment.

# Rise and shine.



Get your wheat seeding off to a stronger, healthier start to help ensure better yields. With Awaken ST, wheat seedlings rise faster and get growing sooner. Awaken ST, a nutritional seed treatment made from a complex of zinc ammonium acetate with potash and a balanced micronutrient seed treatment package, stimulates early root growth and helps wheat to extract more soil nutrients. That's what you need for a stronger start, a better crop and bigger yields.



[www.lovelandproducts.com](http://www.lovelandproducts.com)

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SEED TREATMENTS

# SEED TREATMENTS



# AWAKEN<sup>®</sup> ST



**AWAKEN ST<sup>®</sup>** is a nutritional seed treatment made from a patented complex of zinc ammonium acetate with potash, and a balanced micronutrient seed treatment package including:

**5% Zinc • Boron • Copper • Iron • Manganese • Molybdenum**

#### FEATURES:

- Easy to use and ready to apply in a clear liquid formulation
- Excellent seed coverage and 100% soluble components (*no solids to dust off*)
- Highly compatible with most seed treatments
- Seed safe

#### BENEFITS:

- Provides crucial micronutrients for early plant nutrition
- Helps extract and release soil nutrients into the available soil solution
- Promotes early plant vigor growth for improved yield potential
- Better root systems improve tolerance to drought and other stresses

#### LABELED CROPS:

Cotton, rice, wheat, barley, triticale, sorghum, and millet  
(See label for complete list.)

**ACTIVE INGREDIENTS:** Zinc Ammonium Acetate + Micronutrients

#### APPLICATION RATE RANGE:

4-8 oz/100 pounds of seed

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

# AWAKEN<sup>®</sup> ST



Wheat: Untreated vs **AWAKEN ST**



Cotton: Untreated vs **AWAKEN ST**



Rice: Untreated vs **AWAKEN ST**

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# CONSENSUS<sup>®</sup>

## Start stronger, go farther

**CONSENSUS<sup>®</sup>** is a unique seed treatment designed to promote early germination and quicker root development. It stimulates Systemic Acquired Resistance (SAR) to start seedlings growing faster for a better finish for your crop.

**A faster, healthier start for the seed and seedling leads to faster emergence, better stands, plant stress resistance and better yields.**

### FEATURES:

- Faster germination
- Better early root development
- Plant stress protection

### BENEFITS:

- Healthier, more vigorous seedlings
- Quicker emergence
- More robust root system
- Greater yield potential

### LABELED CROPS:

Soybeans, cotton, small grains  
(See label for complete list.)

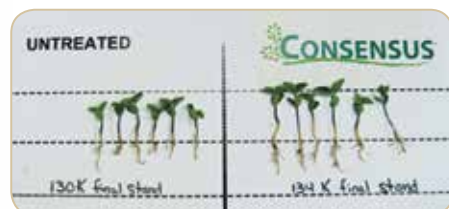
### ACTIVE INGREDIENTS:

IBA + Salicylic Acid + Chitosan

### APPLICATION RATE RANGE:

0.33-1.0 fl oz/100 pounds of seed

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.



Wheatland, IN 2012



Photo courtesy Shannon Peedin

13 Bolls

35 Bolls  
Treated with  
**CONSENSUS**

Multiple components provide 3 complimentary modes of action that benefit the seedling in the following ways:

1. **Chitosan - Increased utilization of seed storage nutrients:** The selected natural polysaccharides found in Chitosan can promote gene expression to produce highly active hydrolases, leading to better use of the nutrient storage in seeds for faster germination and seedling growth.
2. **Indole-3-butyric acid (IBA) - Promotion of root system development:** Auxins in **CONSENSUS**, in the form of IBA, can promote the development of lateral roots and root hairs, thus enhancing the absorption of water and soil nutrients for faster seedling growth and stronger resistance to stresses.
3. **Salicylic Acid (SA) - Increased resistance to microbial pathogens:** SA's mode of action is a Systemic Acquired Resistance (SAR) inducer for seedlings – a trigger for invoking a seedling's natural defenses against pathogens allowing for greater plant vigor and survivability. SA activates gene encoding for pathogenesis-related proteins leading to the accumulation of those proteins, which are toxic to multiple microorganisms. In addition, it can also increase the secondary metabolites such as phytoalexins, which are toxic to a variety of plant pathogens.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

CONSENSUS



Photo Courtesy John Griffin

Cotton seedling on right  
treated with  
**CONSENSUS**



Photo Courtesy Todd Lane, Lake Village, AR

Rice on right treated with  
**CONSENSUS**



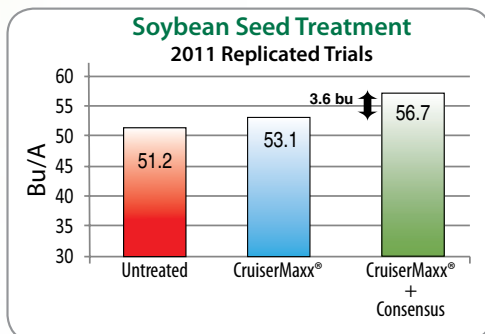
Photo courtesy Todd Kalaher

Healthier plants under stress  
conditions

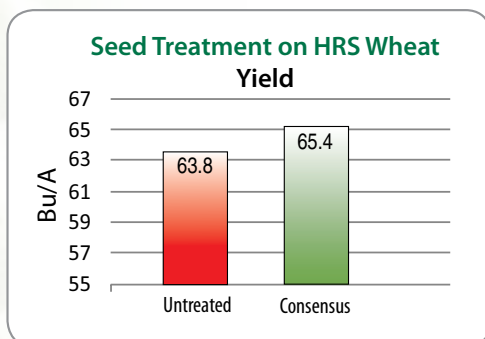
Soybeans on right  
treated with  
**CONSENSUS**

## Healthier, more vigorous seedlings with

# CONSENSUS



*Dr. Timothy Maloney; Agri-Tech Consulting Whitewater, WI 2011.*



*Agren, Inc., R. Buman PhD, and AgriTech Consulting, T. Maloney PhD. Iowa, Illinois and Wisconsin.*



**Plant Health Stimulants** are active ingredients that have a positive effect on plant health. They are typically applied in low quantities to mimic or enhance a plant's metabolism.

**Plant Health Stimulants** can include:

- Plant growth hormones
- Systemic acquired resistance (SAR)
- Amino acid complexes

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# CONSENSUS

Start stronger, go farther

## Start Stronger, Go Farther with Consensus®.



Consensus®, the unique seed treatment designed to get your field crops off to a fast start and stimulate Systemic Acquired Resistance (SAR) for a better finish. Ask your Crop Production Services dealer about Consensus.

Crop  
Production  
Services

**Loveland**  
PRODUCTS

[www.lovelandproducts.com](http://www.lovelandproducts.com)

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## Seed Treatment for Small Grains

**DYNA-SHIELD® FOOThOLD®** contains **two** active ingredients, tebuconazole and metalaxyl, for early-season broad spectrum disease control with outstanding activity on key diseases like smut, Rust and Scab plus an excellent formulation to help ensure uniform coverage, **FOOTHOLD** offers protection and value that can't be beat.

### FEATURES:

- Two active ingredients offer systemic protection against the most damaging early-season cereal diseases
- Excellent formulation for uniform coverage of seed
- Low use rates
- Controls the following diseases:
  - Early season common Root rot
  - Early season *Fusarium* foot rot
  - Early season Powdery mildew and rust (suppression)
  - Early season *Rhizoctonia* root rot
  - Early season Septoria disease complex
  - Flag smut
  - General seed rots
  - Loose smut
  - *Pythium* damping-off
  - Seedborne *Fusarium* scab
  - Stinking smut

**LABELED CROPS:** Barley, oats, triticale, wheat  
(See label for complete list.)

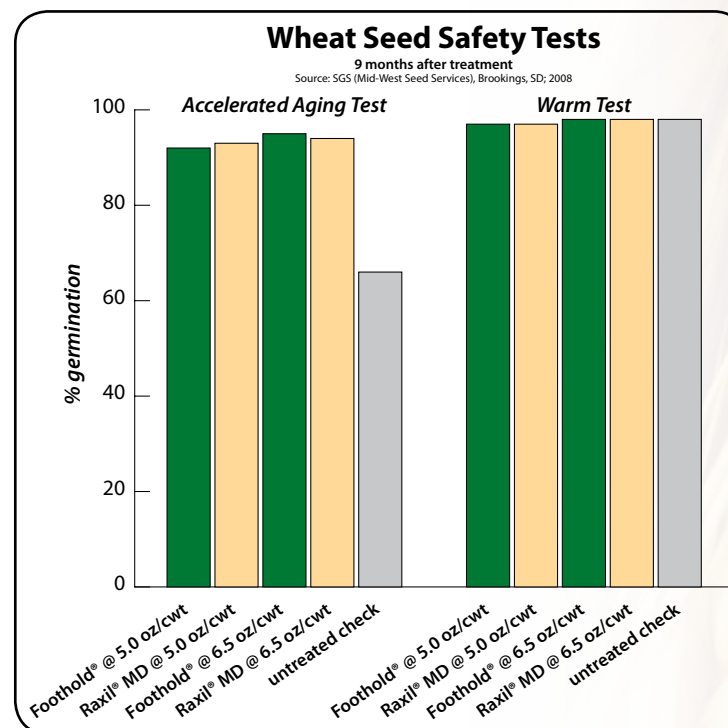
**ACTIVE INGREDIENTS:** Tebuconazole + Metalaxyl



### APPLICATION RATE RANGE:

5.0-6.5 fl oz/100 pounds of seed

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.



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## FOR EARLY SEASON PROTECTION OF SEEDLINGS AGAINST INSECT, INJURY AND SOILBORNE DISEASES FOR BARLEY AND WHEAT

DYNA-SHIELD® FOOTHOLD® VIROCK® contains **three** fungicides, fludioxonil, tebuconazole and metalaxyl plus imidacloprid insecticide, in an easy-to-use, all-in-one formulation.

### FEATURES:

- Protects seeds and seedlings against many diseases including early season *Rhizoctonia*, *Fusarium* foot rot, *Pythium* damping-off, Smuts and other as listed
- Protects against seed decay caused by *Aspergillus*, *Penicillium*, and other species
- Imidacloprid insecticide controls early season Aphids, Hessian fly and Wireworms
- Systemic activity to give seedlings their best chance for a strong start
- Convenient, easy-to-use flowable formulation; pre-colored red

### APPLICATION RATE RANGE:

3.4-5.0 fl oz/100 lbs of seed

Refer to the label for specific crop and application rates, directions, mixing instructions and use precautions.

### ACTIVE INGREDIENTS:

Imidacloprid .....	11.16%
Metalaxyl .....	0.60%
Tebuconazole.....	0.45%
Fludioxonil .....	0.36%



### Controls the following diseases and insects on wheat:

- Early season common Root rot
- Early season *Fusarium* foot rot
- Early season *Pythium* damping-off
- Early season Powdery mildew\*
- Early season *Rhizoctonia* root rot
- Early season Septoria disease complex
- Early season Wheat leaf rust\*
- Seed decay (*Aspergillus*, *Penicillium*, others)
- Early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid)
- Hessian fly
- Wireworms

### Controls the following diseases and insects on barley:

- Barley stripe\*
- Loose smut
- Covered smut
- Early season barley Leaf rust\*
- Early season common Root rot
- Early season *Fusarium* foot rot
- Early season powdery mildew\*
- Early season *Pythium* damping-off
- Early season *Rhizoctonia* root rot
- Seed decay (*Aspergillus*, *Penicillium*, others)
- Early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid)
- Wireworms

\*suppression

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and more!





# Dyna-Shield CONQUEST™

**DYNA-SHIELD CONQUEST™** is a four-way insecticide/fungicide seed treatment for soybeans, as well as dry beans, snap beans and chickpeas. A broad, multi-function combination of fungicide components offers excellent protection against a range of early season soybean diseases. The proven insecticide in **DYNA-SHIELD CONQUEST** performs well on many early season insects, including aphids, bean leaf beetles and thrips.

#### FEATURES:

- Pre-formulated in one container
- Pre-colored red

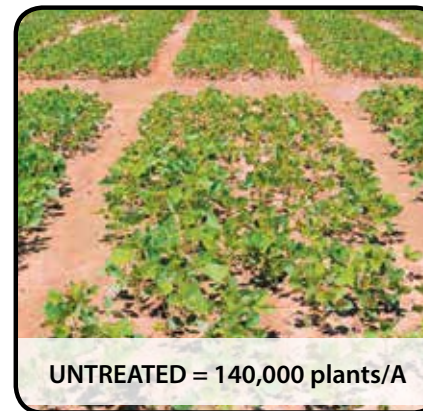
#### BENEFITS:

- No mixing, all-in-one convenience

#### FOUR ACTIVE INGREDIENTS:

- |                    |   |
|--------------------|---|
| Imidacloprid       | <ul style="list-style-type: none"> <li>• Early season protection against injury by aphids, bean leaf beetle, grape colaspis, leaf miners, leaf hoppers, Mexican bean beetle, pea leaf weevil, seed corn maggot, three-cornered alfalfa hopper, thrips, white grubs, and wireworm</li> </ul> |
| Metalaxyl          | <ul style="list-style-type: none"> <li>• Protects against <i>Pythium</i>, <i>Phytophthora</i> and systemic downy mildew</li> </ul>  |
| Thiophanate Methyl | <ul style="list-style-type: none"> <li>• Protects against <i>Fusarium</i> and <i>Rhizoctonia</i></li> </ul>   |
| Fludioxinil        | <ul style="list-style-type: none"> <li>• Protects against <i>Fusarium</i>, <i>Rhizoctonia</i>, and suppresses seed-borne <i>Sclerotinia</i> and <i>Phomopsis</i> spp.</li> </ul>  |

Dyna-Shield  
**CONQUEST™**



\*180,000 seeds/A planted in trial



#### APPLICATION RATE:

##### Soybeans

- 4 fl oz/100 lbs seed, or
- 1.867 fl oz/140K seed

##### Dry beans, Snap beans and Chickpeas

- 4 fl oz/100 lbs seed

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## Dyna-Shield® Seed Treatments



**ACTIVE INGREDIENT:** Fludioxonil  
(480 grams per liter)

### LABELED CROPS:

Cereals (including barley, oats, wheat), corn (field, pop, sweet), rice, sorghum grown for grain, forage or silage, cotton, rape, sunflower, grass forage, fodder and hay, legume vegetables (succulent or dry), nongrass animal feeds (forage, fodder, straw, hay), peanuts, root and tuber vegetables (including potatoes), soybeans (See label for complete list.)

### APPLICATION RATE RANGE:

0.08-0.16 fl oz/100 lb of seed  
Refer to the label for specific crop and application rate.

### DISEASES CONTROLLED:

Decay, Damping-off, and Seedling blight caused by seed-borne and soil-borne Fungi.



**ACTIVE INGREDIENT:** Imidacloprid  
(600 grams per liter)

### LABELED CROPS:

Barley, canola, corn (field and sweet), cotton, sorghum, soybeans, sugar beets, sunflower, wheat (See label for complete list.)

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## Dyna-Shield Seed Treatments



### APPLICATION RATE RANGE:

Varies widely by crop  
Refer to the label for specific crop and application rate.

### PROTECTION FROM CROP INSECTS:

**Cotton:** Early season Thrips and Aphids

**Soybeans:** Seed Corn Maggot, feeding damage from certain Aphids and over-wintering Bean Leaf Beetles

**Wheat and other listed cereals:** Aphids including Bird cherry-oat, English grain, Greenbug and Russian wheat aphids, Hessian fly, Wireworm



**ACTIVE INGREDIENT:** Metalaxyl  
(318 grams per liter)

### LABELED CROPS:

Canola\*, rapeseed\*, cotton, forage grasses, forage legumes, grain crops (including barley, corn, rye and wheat), peanuts\*, rice\*, seed and pod vegetables, sorghum, soybeans, sunflowers (See label for complete list.)

\*Not registered for use in California

### APPLICATION RATE RANGE:

0.75-1.50 fl oz/100 lbs seed  
Refer to the label for specific crop and application rate.

### DISEASES CONTROLLED:

*Pythium* damping-off, Systemic downy mildew, Early season *Phytophthora*, Seed decay

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PEANUT Inoculant +  
LCO Promoter Technology®

# Dyna Start MAX

**DYNA-START® MAX FOR PEANUTS** with **LCO Promoter Technology®** is a unique liquid for in-furrow application – essentially enabling the peanut crop to achieve its full potential by maximizing crop performance all season long.

## FEATURES:

- Advanced emergence producing healthier, faster developing plants
- Earlier and increased nodule development for improved nitrogen fixation
- Earlier fruit set reduces the risk of temperature related damage
- Increased yield potential and grade for improved return on investment

The patented **LCO Promoter Technology** is a naturally occurring molecule which enhances both root and shoot development, improving health immediately and independently of soil and environmental conditions. The result of this early-season activity is a stronger, healthier plant that is better able to handle environmental stresses throughout the season.

**APPLICATION RATE:** 1 fl oz/1,000 ft of row

**CASE TREATS:** 40 acres at 36-inch row width

**PACKAGE TREATS:** 10 acres at 36-inch row width

## MINIMUM GUARANTEE:

**ACTIVE:** 1 x 10<sup>-7</sup>% lipo-chitooligosaccharide in an aqueous carrier and *Bradyrhizobium sp* minimum guarantee of 2 x 10<sup>9</sup> viable cells per gram

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## SEED TREATMENT COMPATIBILITY

DYNA-START® MAX PEANUTS	PLANTING WINDOW TANK MIX
Abund®	• Tank mix must be used within 12 hours
ACA Plus® only	• Recommendation of compatibility made on the basis of product formulation at the time of testing – user assumes all risk
Admire® Pro	• Water used for dilution of Dyna-Start Max or preparation of an Dyna-Start Max tank mix must be non-chlorinated
Asset®, Asset® NH3, Asset® PPS, Asset®, Asset® RTU	• Tank mixes with Dyna-Start Max must be used within 12 hours. Do not hold tank mixed materials for later use. Mix only what will be used within a 12 hour time period.
Awaken® ST	• Products listed were tested as individual combinations with Dyna-Start Max. Multiple product tank mixes are not recommended
Energy Max®	• Failure to follow these guidelines will invalidate the Dyna-Start Max product warranty
Green Sol GS-48	• A compatible recommendation indicates that the viability of the rhizobia in Dyna-Start Max product will not be affected
Liberate® Ca	• Compatibility recommendations are based on dilution with water to a minimum of 5 gallon/acre total liquid application rate. Dilution of Dyna-Start Max and in-furrow chemicals to less than a 5 gallon/acre rate can lead to incompatibility, and is not recommended
NutrAsyst® Concentrate only	• Tank mix must be used within 12 hours
Orthene®	
PGR-IV®	
Proline® 480 SC	
Stimupro	
Wrangler®	

## Seed Compatibility Glossary

**Sequential application:** the seed treatment must be applied and allowed to dry before the inoculant is applied.

**Sequential application (planter box):** JumpStart® is applied to the seed first and allowed to dry before the seed treatment is applied in the planter box.

**Simultaneous application:** the seed treatment can be applied at the same time as the inoculant but separate applicators must be used.

**Tank mix application:** the inoculant can be mixed directly with diluted seed treatment and applied as one solution - using one applicator.

- When tank mixing an inoculant with another seed treatment, add water to the seed treatment to bring the total liquid volume up to the water rates recommended on the inoculant label – then add the inoculant.
- The inoculant can be tank mixed with the seed treatment for a maximum of 6 hours before applying to the seed.

# Dyna-Start™ PBC

**DYNA-START™ PBC** is a liquid seed treatment for soybeans designed to promote early germination, quick root development, and optimized nitrogen fixation.

## FEATURES:

- Faster germination & root development
- Plant stress protection
- Earlier and increased nodule development

## PACKAGE INFORMATION:

### Each case includes:

- Consensus® formulation of IBA + Salicylic Acid + Chitosan
- Dyna-Start *Bradyrhizobium japonicum* inoculant
- Extender for longer pre-plant application window

## CASE TREATS:

- 1 x 400 unit size, and
- 5 x 2 x 40 unit size

## APPLICATION RATE:

1.9 fl oz/ 100 pounds seed



ABG Ag Services, Sheridan, IN (2014)



**Plant Health Stimulants** are active ingredients that have a positive effect on plant health. They are typically applied in low quantities to mimic or enhance a plant's metabolism.

**Plant Health Stimulants** can include:

- Plant growth hormones
- Systemic acquired resistance (SAR)
- Amino acid complexes

## CONSENSUS®



- Three components provide complementary modes of action:
- Chitosan creates faster germination through increased utilization of seed storage nutrients
- Salicylic Acid provides SAR (Systemic Acquired Resistance) to trigger a seedling's natural defenses against pathogens, allowing greater plant vigor and survivability
- Indole-3-butyric acid (IBA) can promote the development of lateral roots and root hairs, for enhanced water and soil nutrient absorption



## RHIZOBIA INOCULANT

- A quality rhizobia inoculant can ensure optimized nitrogen-fixing nodulation to allow a crop to achieve its full genetic potential
- A 70 bushel soybean crop requires nearly 300 pounds of nitrogen per acre
- The most efficient method of providing this N need is through the biological fixation process that occurs within the soybean nodules



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and more!



# EQUITY®

## Invest in the Best

**EQUITY®** is a unique, four-way insecticide/fungicide seed treatment. With **three** fungicide active ingredients, **EQUITY** fortifies soybean seedlings against a broad variety of early-season diseases. The proven insecticide component performs well on many early season insects, including Thrips.

### FEATURES:

- Superior *Fusarium* control
- Controls Pod and Stem blight
- **All-in-one convenience:**
  - Pre-formulated in one container
  - Pre-colored blue

### BENEFITS:

- Low use rate
- Storage stability and application properties
- Compatible with *Rhizobium* inoculants
- Provides better germination and stands when soybean seed quality is below average

### ACTIVE INGREDIENTS:

Thiamethoxam + Mefenoxam + Fludioxonil + Thiabendazole

### APPLICATION RATES:

- 3.0 fl oz/CWT; or
- 1.4 fl oz/140K unit of seed; or
- 0.09 mg a.i./seed

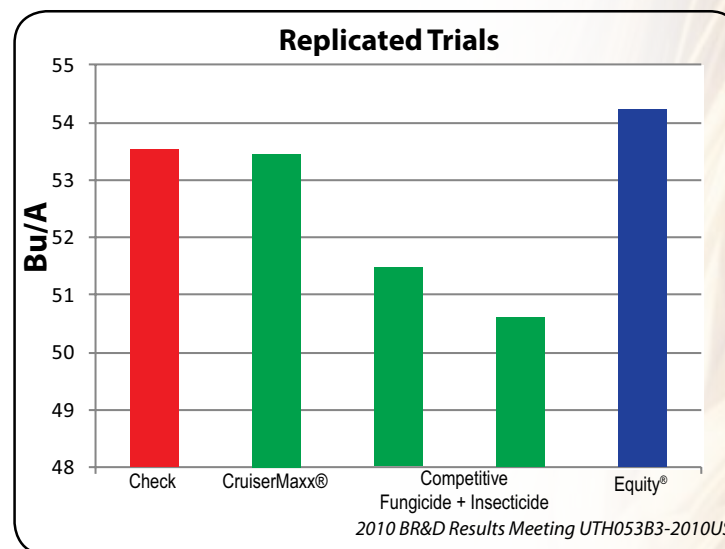
# EQUITY®

### DISEASE PROTECTION:

- *Pythium*
- Early-season *Phytophthora*
- *Rhizoctonia*
- *Fusarium*
- Seedborne *Sclerotinia* (White mold)
- Seedborne *Phomopsis*

### INSECT PROTECTION:

- Soybean Aphid
- Bean Leaf Beetle
- Seed Corn Maggot
- Wireworm
- Grape Colaspis



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# EQUITY<sup>®</sup> VIP

**EQUITY<sup>®</sup> VIP** is a unique, **five-way** insecticide/fungicide seed treatment for soybeans. A broad, multifunction combination of fungicide components, including a new **SDHI class active ingredient**, offers unmatched fortification against a range of early season soybean diseases. The proven insecticide in **EQUITY VIP** performs well on many early season insects, including aphids and thrips.

## FEATURES:

### All-in-one convenience:

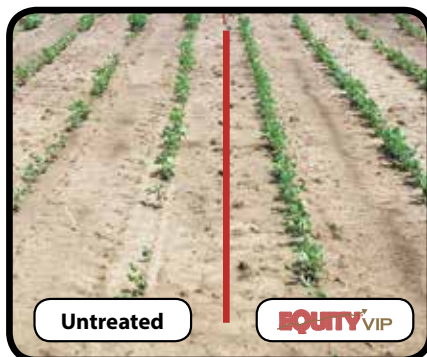
- Pre-formulated in one container
- Pre-colored red

## BENEFITS:

- Low use rate for drier seed and better handling
- Promotes better emergence, faster speed to canopy, stress tolerance, nutrient uptake, improved vigor and higher yield potential
- Creates healthier, more robust root systems that produce soybeans with better yield performance and stability

## APPLICATION RATES:


- 2.96 fl oz/100 lbs soybean seed; or
- or 1.38 fl oz/140K unit (based on 3,000 seeds/lb)



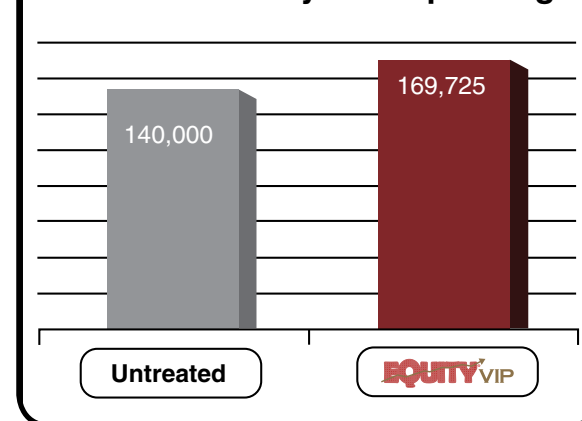
ABG Ag Services, Sheridan, IN

# EQUITY<sup>®</sup> VIP

## FIVE ACTIVE INGREDIENTS:

- |   |   |
|---|---|
| Sedaxane<br>(  Vibrance <sup>®</sup> ) | • Active against seed decay, seedling blight and damping-off caused by <i>Rhizoctonia</i> species                                   |
| Mefenoxam   | • Active against <i>Pythium</i> , <i>Phytophthora</i> and systemic downy mildew   |
| Thiabendazole   | • Protection against phomopsis spp. and suppression of <i>Sclerotinia</i>   |
| Fludioxinil   | • Active against <i>Fusarium</i> and <i>Rhizoctonia</i> , and suppresses seed-borne <i>Sclerotinia</i> and <i>Phomopsis</i> species |
| Thiamethoxam  | • Systemic protection against listed early season insects   |

## Plants/A - 36 days after planting



Loveland Research Farm Owensboro, KY

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GIVE YOUR  
SOYBEAN SEEDS THE  
RED CARPET TREATMENT.



**EQUITY** VIP

Equity<sup>®</sup> VIP protects young soybeans  
from yield-robbing diseases and insects.

Give your beans a stronger start with Equity<sup>®</sup> VIP seed treatment. Equity VIP combines five active ingredients to protect seedlings from a range of early-season diseases and insects. Equity VIP promotes better emergence, stronger roots, stress tolerance and more, to treat you to first-class yields.

Visit [LovelandProducts.com](http://LovelandProducts.com)



## CEREALS SEED TREATMENT EFFICACY GUIDE



# CEREALS SEED TREATMENT EFFICACY GUIDE





Common Bunt	E	E	N	N
Dwarf Bunt	F	F	N	N
Flag Smut	E	E	N	N
Loose Smut	E	E	N	N
Pythium Seed Decay/ Seed Damping Off	E	E	E	N
Common Root Rot	G	G	N	N
Fusarium Foot Rot	G	G	N	N
Seed Decay Fungi	G	G	N	N
Powdery Mildew	G	G-E	N	N
Leaf Rust	F-G	F-G	N	N
Stem Rust	F-G	F-G	N	N
Stripe Rust	P	P	N	N
Take All	P	P	N	N
Seedling Blight	P	P	N	N
Wireworm	N	G	N	G

Dividend®	Dividend Extreme®	CruiserMaxx® Cereals	CruiserMaxx® Cereals	Vibrance® Vibrance™ Cereals	Stamina®	Stamina® F3	EverGol® Energy	Common Bunt
E	E	E	E	E	E	E	E	Common Bunt
G-E	G-E	G-E	G-E	G-E	F	F	F	Dwarf Bunt
E	E	E	E	E	E	E	E	Flag Smut
G-E	G-E	G-E	G-E	G-E	F	F	F	Loose Smut
N	E	N	E	E	N	E	E	Pythium Seed Decay/ Seed Damping Off
G	G	G	G	G	G	G-E	G-E	Common Root Rot
G	G	G	G	G	G	G	E	Fusarium Foot Rot
G	G	G	G	E	G	G-E	G-E	Seed Decay Fungi
G	G	G	G	G-E	G	G	E	Powdery Mildew
F-G	F-G	F-G	F-G	F-G	P	P	F-G	Leaf Rust
F-G	F-G	F-G	F-G	F-G	P	P	F-G	Stem Rust
P	P	P	P	P	P	P	P	Stripe Rust
P	P	P	P	P	P	P	P	Take All
P	P	P	P-G	P-G	P	P	P	Seedling Blight
N	N	G	G	N	N	N	N	Wireworm

E=EXCELLENT, G=GOOD, F=FAIR, P=POOR, N=NONE



## INSECTICIDE/FUNGICIDE SEED TREATMENTS: EQUITY + VIBRANCE vs. ACCELERON vs. EVERGOL ENERGY

	Active Ingredient	Phytophthora	Pythium	Rhizoctonia
	Mefenozam	Excellent	Excellent	None
EQUITY	Fludioxonil	None	None	Good
EQUITY	Thiabendazole	None	None	None
EQUITY	Thiamethoxam	None	None	None
	Sedaxane	Excellent	Excellent	Excellent

ACCELERON® DX-309	Metalaxyl	Excellent	Excellent	None
ACCELERON DX-109	Pyraclostrobin	N/A	Fair	Fair
ACCELERON DX-612	Fluxapyroxad	None	None	Fair
ACCELERON IX-409	Imidacloprid	None	None	None

EVERGOL™ ENERGY	Metalaxyl	Excellent	Excellent	None
EVERGOL ENERGY	Penflufen	None	None	Good
EVERGOL ENERGY	Prothioconazole	None	None	N/A
GAUCHO® 600	Imidacloprid	None	None	None



EXCELLENT, VERY GOOD, GOOD, FAIR, NONE, NO INFORMATION AVAILABLE (N/A)

EQUITY IS A PREMIX OF THIAMETHOXAM + MEFENOXAM + FLUDIOXONIL + THIABENDAZOLE  
ACCELERON IS A PREMIX OF PYRACLOSTROBIN + METALAXYL + IMIDACLOPRID + METALAXYL  
EVERGOL ENERGY IS A PREMIX OF METALAXYL + PENFLUFEN + PROTHIOCONAZOLE

EQUITY BRAND FUNGICIDE/INSECTICIDE  
ACCELERON FUNGICIDE/INSECTICIDE  
PIONEER® EVERGOL ENERGY FUNGICIDE/INSECTICIDE

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

## INSECTICIDE/FUNGICIDE SEED TREATMENTS cont.

Fusarium	Seed-Borne Phomopsis	Seed-Borne Sclerotinia	Visual Vigor Rating	
None	None	None	None	
Excellent	Good	Excellent	None	EQUITY
Excellent	Very Good	None	None	EQUITY
None	None	None	Very Good	EQUITY
Excellent	Very Good	Excellent	Very Good	

None	None	None	None	ACCELERON® DX-309
Fair	N/A	N/A	None	ACCELERON DX-109
N/A	None	None	None	ACCELERON DX-612
None	None	None	Good	ACCELERON IX-409

None	None	None	None	EVERGOL™ ENERGY
Fair	N/A	N/A	None	EVERGOL ENERGY
Excellent	N/A	N/A	None	EVERGOL ENERGY
None	None	None	Good	GAUCHO® 600

\*FOR FIELDS WITH A HISTORY OF EARLY-SEASON PHYTOPHTHORA, ADD ADDITIONAL DYNA-SHIELD® FUNGICIDE METALAXYL (UP TO 0.375 FLUID OUNCES PER CWT.) OR APRON XL® FUNGICIDE SEED TREATMENT (MEFENOXAM AT 0.16-0.32 FLUID OUNCES PER CWT.) TO THE STANDARD RATE OF MEFENOXAM IN EQUITY SEED TREATMENT.

NOTE: EFFICACY BASED ON SYNGENTA STUDIES USING LABELED RATE OF ACTIVE INGREDIENTS.

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ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

## Seed Treatment Stewardship

### Minimize off-Site Drift of Seed Treatment Materials

Seed treatments (insecticide and/or fungicide active ingredients) reduce potential risks to workers, minimize potential runoff to waterways, and lower the overall amount of pesticide applied in the environment. To reduce pollinator exposure, follow these precautions (specific label information takes precedence).

- Always use high quality seed free from excessive dust.
- For seed types which require that pesticides be coated onto the seed, always use an appropriate coating system that keeps abrasion of coated pesticide to a minimum.
- Follow planter manufacturer recommendations for use of talc, graphite, or other flow agent. Avoid excess use to minimize dust.
- Avoid releasing dust from seed treatment into the air. When opening seed containers and during filling, emptying, or cleaning of the planting equipment, avoid dust movement that could cause exposure.
- Avoid off-site movement of dust from treated seeds during planting. Be aware of wind speed and direction.
- To protect birds and mammals, treated seeds must be incorporated into the soil at proper planting depth, in particular at row ends and field corners.
- Be aware of the presence of flowering crops in or adjacent to the field which could attract pollinators.
- Ensure that no blooming weeds are present in the field at planting, through use of herbicides or tillage.

#### For more information:

The Guide to Seed Treatment Stewardship (pdf) and web site: [seed-treatment-guide.com](http://seed-treatment-guide.com) from the American Seed Trade Association and CropLife America.

The Guide contains recommendations for planting, handling, transport, and storage of treated seed; selection and safe use of seed treatment product; and treated seed labeling. A seed treatment glossary and list of resources are included.

**ALWAYS READ AND FOLLOW LABEL DIRECTIONS.**

# CEREAL PESTS & DISEASES REFERENCE

## APHID

### PEST DESCRIPTION

- Colonize small grains early in the season
- Injure the plants by sucking sap or by transmitting the Barley Yellow Dwarf Virus (BYDV)
- Low aphid abundance early in the fall can result in high BYDV occurrence in winter cereals



### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



0.8 - 2.4 fl oz/100 lbs seed

## HESSIAN FLY

### PEST DESCRIPTION

- Black in color (female abdomen is dull red) and smaller than the common mosquito
- Feeding damages the stem and reduces plant vigor
- Results in weak and stunted plants, which may die in the winter



*Photo credit: D. Johnson, University of Kentucky*

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



0.8 - 2.4 fl oz/100 lbs seed

## WIREWORM

### PEST DESCRIPTION

- Reddish brown, yellow or white with three pairs of legs behind the head
- Larval form of click beetles
- Feed on germinating seeds, roots and seedlings
- Kill plants directly or create wounds for advantageous disease infection
- No rescue treatment



*Photo credit: M. Boetel, North Dakota State University*

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



0.8 - 2.4 fl oz/100 lbs seed

(Low use rate for "wireworm-only" protection:  
0.13 - 0.26 fl oz/100 lbs seed)

## FUSARIUM FOOT ROT & COMMON ROOT ROT

### DISEASE DESCRIPTION

- Dark brown to black lesions on roots, subcrown internodes, and stem bases
- Infected plants may be stunted and/or chlorotic
- If severe, plants may mature early, produce shriveled grain, have white heads void of kernels, and appear bronze or bleached or die prematurely



Photo credit: University of Nebraska

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

## POWDERY MILDEW

### DISEASE DESCRIPTION

- Symptoms can be found on leaves, stems and ears, but leaves are most commonly infected
- Typically, white pustules appear which produce masses of spores with a powdery appearance
- Eventually, black spore cases can be found embedded in the mildew pustules



Photo credit: Cereal Disease Encyclopedia

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

## PYTHIUM ROOT ROT

### DISEASE DESCRIPTION

- Infects and damages root systems
- Mild infections may reduce stand
- Adult plants may be stunted and/or chlorotic
- Severe infections cause a general Root rot



Photo credit: L. Ortiz-Ribbing, University of Illinois

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

## RHIZOCTONIA

### DISEASE DESCRIPTION

- Usually apparent as patches of thin stunted plants
- Often yellowing or purpling with seedling die-back
- Points of brown rotted material along plant stem
- Maturity often delayed



Photo credit: Cereal Disease Encyclopedia

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

## SEPTORIA

### DISEASE DESCRIPTION

- Often seen early in the season
- Black funnel-shaped fruiting bodies on lower leaves
- Mature leaves may contain rectangular lesions or become brown and necrotic



Photo credit: Cereal Disease Encyclopedia

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

## SMUTS

### DISEASE DESCRIPTION

- Stinking Smut/Common Bunt
  - Plants may be stunted; headed spikelets "flare out" and develop a greasy, off-green appearance
- Loose Smut
  - At ear emergence, each grain may be replaced by black spores
- Flag Smut
  - Often severely stunted plants; ears may fail to emerge; long dark streaks on blades and sheaths



Photo credit: Cereal Disease Encyclopedia

### SEED TREATMENT OPTIONS



3.4 - 5.0 fl oz/100 lbs seed



5.0 - 6.5 fl oz/100 lbs seed

# SOYBEAN PESTS & DISEASE REFERENCE

## BEAN LEAF BEETLE

### DISEASE DESCRIPTION

- Native to the U.S.
- ¼" long, yellow, tan or red
- Overwintering adults feed on early season cotyledons, stems, unifoliates & emerging trifoliates
- Stand losses, leaf chewing



Photo credit: J. Obermeyer

### SEED TREATMENT OPTIONS

**EQUITY**<sup>VIP</sup>

2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds



1.6 - 3.2 fl oz/100 lbs seed  
Use higher rates to provide increased length of protection and for heavy insect pressure.

## SEED CORN MAGGOT

### DISEASE DESCRIPTION

- Damp cool seasons
- Reduced tillage fields with decaying residue
- Burrow into the seed, often destroying the germ
- Heavily infested crops may not emerge



Photo credit: University of Illinois

### SEED TREATMENT OPTIONS

**EQUITY**<sup>VIP</sup>

2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds



1.6 - 3.2 fl oz/100 lbs seed  
Use higher rates to provide increased length of protection and for heavy insect pressure.

## SOYBEAN APHID

### DISEASE DESCRIPTION

- Feeds on plant juices
- Reduction in plant vigor, leaf puckering, soybean yield
- Aphid honeydew can promote leaf mold and reduced photosynthetic capacity



Photo credit: J. Obermeyer

### SEED TREATMENT OPTIONS

**EQUITY**<sup>VIP</sup>

2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds



1.6-3.2 fl oz/100 lbs seed

## PHOMOPSIS SEED DECAY

### DISEASE DESCRIPTION

- Infection can result from infected seeds or infested debris from previous soybean crops
- Increased risk of seedling damping off
- Young seedlings may become infected and symptoms may be found before the first trifoliolate stage
- The fungi infect pods and seeds, which often are small and shriveled at harvest



Photo credit: Iowa State University

### SEED TREATMENT OPTIONS

**EQUITY<sup>®</sup>VIP** 2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds

## PYTHIUM DAMPING OFF

### DISEASE DESCRIPTION

- First seedling disease to appear
- Prefers cold soil temperatures
- Dead seedling may appear, often with a rotted appearance
- Leaves of infected seedlings are initially gray-green and then turn brown
- Diseased plants easily pulled from the soil because of rotted roots



Photo credit: Iowa State University

### SEED TREATMENT OPTIONS

**EQUITY<sup>®</sup>VIP** 2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds



0.75 – 1.50 fl oz/100 lbs seed

## PHYTOPHTHORA ROOT ROT

### DISEASE DESCRIPTION

- Prefers warm soil (approximately 80°F)
- Stem discoloration usually limited to the cortical layer of the main root and hypocotyl
- Infected stems remain firm and dry without rot appearance typical to Pythium or Phytophthora rot
- Typical symptoms are localized brown-to-reddish brown lesions on the hypocotyl at the soil line.



Photo credit: Iowa State University

### SEED TREATMENT OPTIONS

**EQUITY<sup>®</sup>VIP** 2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds



0.75 – 1.50 fl oz/100 lbs seed  
(add to Equity at 0.375 fl oz/10 lbs seed  
for heavy Phytophthora pressure)

## RHIZOCTONIA SEEDLING BLIGHT

### DISEASE DESCRIPTION

- Normally appears when the weather becomes warm
- Stem discoloration by *Rhizoctonia* is usually limited to the cortical layer of the main root and hypocotyl



Photo credit: Iowa State University

### SEED TREATMENT OPTIONS

**EQUITY<sup>®</sup>VIP** 2.96 fl oz/100 lbs seed or  
1.38 fl oz/140K seeds

# REFERENCE GUIDE

## PROPER TANK MIXING PROCEDURES

Every year when application season rolls around, the number of customer calls concerning tank mix compatibility problems increases. In most cases these issues can be traced to simple product management practices that will eliminate most concerns. The most common issues are:

- Incorrect product mixing order
- Incomplete mixing of product prior to adding a second product
- Lack of agitation of product: inadequate bulk storage tank or mini-bulk tank recirculation before use, package product not shaken well, no agitation action in spray tank
- Spray tank contamination or not clean
- Product sitting overnight in the spray tank

Other factors that can make mixing more difficult are cold temperatures of the carrier (water, liquid fertilizer) that is common during early spring seasons. Under these conditions, it is important to maintain adequate agitation to ensure proper suspension of the product. Lack of carrier volume may cause problems while mixing products.

## OTHER TANK MIX GUIDELINES

- If a known product compatibility issue exists or the water or fertilizer carrier is cold, a compatibility agent may be used to help with mixing problems. COMP-AIDE or E-Z Mix work well.
- UNFOAMER® may be used if excessive foam is a problem. Surfactant loaded glyphosate products or organo-silicone surfactant products may cause excessive foaming.

## MIXING WITH GLYPHOSATE OR GLUFOSINATE FORMULATIONS

The following guidelines can be utilized throughout the season to avoid tank mixing problems:

- Fill the spray tank half full with carrier (water or fertilizer). Make sure the agitation system is engaged and working properly
- If glyphosate or glufosinate (Liberty®) is to be mixed, a water conditioning agent should be added to the spray tank first, such as Choice® Trio, WeatherGard Complete® or Choice® Weather Master



## FORMULATION ABBREVIATIONS

- DF – Dry Flowable
- EC – Emulsifiable Concentrate
- EW – Emulsion in Water
- F – Flowable liquid
- ME – Micro-encapsulated
- OD – Oil Dispersion
- S – Solution
- SC – Suspension Concentrate
- SG – Soluble Granule
- SP – Soluble Powder
- WDG – Water Dispersible Granule
- WSP – Water Soluble Packet

## LOVELAND PRODUCTS MIXING ORDER EXAMPLES

**EXAMPLE:** Crop – Corn  
**APPLICATION TIMING:** Post-emerge @ V5  
**PRODUCTS OF CHOICE:** Makaze® Yield Pro, Satori®, Black Label® ZN, WeatherGard Complete®

### MIXING ORDER:

1. Fill spray tank ¼ to ½ full of carrier
2. Add WeatherGard Complete
3. Use proper agitation
4. Add Makaze Yield Pro glyphosate
5. Add Satori fungicide
6. Add Black Label ZN last
7. Fill remainder of spray tank with remainder of needed carrier and continue agitation.
8. Spray field

**EXAMPLE:** Crop – Soybean  
**APPLICATION TIMING:** Post emerge @ R3  
**PRODUCTS OF CHOICE:** Satori®, Swagger®, Re-nforce® K, Black Label® ZN, Franchise®

### MIXING ORDER:

1. Fill spray tank ¼ to ½ full of carrier
2. Use proper agitation
3. Add Satori fungicide
4. Add Swagger insecticide
5. Add Franchise adjuvant
6. Add Black Label ZN
7. Add Reinforce K
8. Fill remainder of spray tank with remainder of needed carrier and continue agitation.
9. Spray field

**EXAMPLE:** Crop – Wheat  
**APPLICATION TIMING:** Post-emerge @ 4 leaf to tillering  
**PRODUCTS OF CHOICE:** Hat Trick®, Fitness®, Tombstone™ Helios®/Warhawk®, LI700®

### MIXING ORDER:

1. Fill spray tank ¼ to ½ full of carrier
2. Use proper agitation
3. Add Hat Trick herbicide
4. Add Fitness fungicide
5. Add Tombstone Helios/Warhawk
6. Add LI700
7. Fill remainder of spray tank with remainder of needed carrier and continue agitation.
8. Spray field

## WALES/DALES

### MIXING ORDER FOR CHEMICAL FORMULATIONS

**Pesticides should be added to the tank using the WALES or DALES method to help avoid mixing issues.**

- Fill spray tank  $\frac{1}{4}$  -  $\frac{1}{2}$  full with carrier. Be sure agitation system is in working order.
- Add water conditioner and any compatibility agents if needed.

## W or D

Dry formulations should be added to the tank first such as: wettable powders (WP/W), water dispersible granules (WDG), water soluble packets (WSP), dry flowable (DF). Be sure dry products are thoroughly dissolved prior to adding other products.

## A

Agitation should be continuous and provide enough action to “roll” the surface of the carrier.

## L

Add liquid (L), flowable (F), soluble concentrate (SC), formulations next.

## E

Emulsifiable Concentrates (EC) should be added next. Micro-encapsulated (ME) formulations should be added after the EC product.

## S

Add surfactants and other adjuvants last. This would include NIS, crop oils, MSO, drift control agents, etc. Final step is to fill the tank with the remainder of the needed carrier and continue agitation.

- When adding a nutritional product, add to the tank last.
- Always do a jar test if there are any concerns about product mixes.

## NOZZLE OUTPUTS

### (20-INCH NOZZLE SPACING\*)

Output	Ground speed, miles per hour					
	3	4	5	6	7	8
	<b>5 gal per acre</b>					
Gal. per minute	.05	.067	.084	.101	.118	.135
Ounces per minute	6.4	8.6	10.8	12.9	15.1	17.2
	<b>6 gal per acre</b>					
Gal. per minute	.06	.081	.101	.121	.141	.162
Ounces per minute	7.8	10.3	12.9	15.5	18.1	20.6
	<b>7 gal per acre</b>					
Gal. per minute	.071	.094	.118	.141	.165	.189
Ounces per minute	9.0	12.1	15.1	18.1	21.1	24.2
	<b>8 gal per acre</b>					
Gal. per minute	.081	.108	.135	.162	.189	.216
Ounces per minute	10.3	13.8	17.2	20.7	24.1	27.6
	<b>9 gal per acre</b>					
Gal. per minute	.091	.121	.152	.182	.212	.242
Ounces per minute	11.6	15.5	19.4	23.3	27.1	31.0
	<b>10 gal per acre</b>					
Gal. per minute	.101	.135	.168	.202	.236	.269
Ounces per minute	12.9	17.2	21.5	25.9	30.1	34.4
	<b>15 gal per acre</b>					
Gal. per minute	.152	.202	.253	.303	.354	.404
Ounces per minute	19.4	25.9	32.3	38.8	45.2	51.8
	<b>20 gal per acre</b>					
Gal. per minute	.202	.269	.337	.404	.472	.538
Ounces per minute	25.9	34.5	43.1	51.8	60.2	69.0

\* Data also applies if every other outlet is plugged and two nozzles are used per drop, as is often the case in post-emergence herbicide application. The table may be used to:

1. Determine gallonage per acre at given ground speed and nozzle output.
2. Select proper ground speed when operating at a given nozzle pressure and output.
3. Select new nozzles when range of gal. per acre and ground speed is known.

# AIRCRAFT CALIBRATION

## Acres covered per minute

	Swath width in feet									
	30	35	40	45	50	75	100	200	300	500
75	4.5	5.2	6.0	6.7	7.5	11.2	15.0	30.0	45.0	75.0
80	4.8	5.6	6.4	7.2	8.0	12.0	16.0	32.0	48.0	80.0
85	5.1	5.9	6.8	7.6	8.5	12.7	17.0	34.0	51.0	85.0
90	5.4	6.3	7.2	8.1	9.0	13.5	18.0	36.0	54.0	90.0
95	5.7	6.6	7.6	8.5	9.5	14.2	19.0	38.0	57.0	95.0
100	6.0	7.0	8.0	9.0	10.0	15.0	20.0	40.0	60.0	100.0
110	6.6	7.7	8.8	9.9	11.0	16.5	22.0	44.0	66.0	110.0
120	7.2	8.4	9.6	10.8	12.0	18.0	24.0	48.0	72.0	120.0
130	7.8	9.1	10.4	11.7	13.0	19.5	26.0	52.0	78.0	130.0
140	8.4	9.8	11.2	12.6	14.0	21.0	28.0	56.0	84.0	140.0
150	9.0	10.5	12.0	13.5	15.0	22.5	30.0	60.0	90.0	150.0

The rate of application in gallons or pounds per minute is calculated by multiplying the acres per minute by the number of gallons or pounds per acre to be applied. Take for example a 100-mile-per-hour aircraft that has a 50-foot effective swath. The chart indicates that the plane has a coverage of 10 acres per minute. If spray is to be applied at a rate of 2 gallons per acre, the unit should be calibrated to dispense 20 gallons per minute (2 X 10 = 20). If 7.5 pounds of dry material is to be applied per acre, the unit should be calibrated to dispense 75 pounds per minute (10 X 7.5 = 75).

The basic formula for calculating acres per minute is:

$$\frac{\text{swath width} \times 2 \times \text{miles per hour}}{1,000}$$

# COMPUTING PLANT POPULATIONS AND YIELDS

Row Width	Length of Row in 1/1000 Acre
40 inches	13-ft., 1-in.
38 inches	13-ft., 9-in.
36 inches	14-ft., 6 in.
30 inches	17-ft., 5-in.
20 inches	26-ft., 2-in.
15 inches	34-ft., 10-in.

### Determining Plant Population\*

1. Measure off 1/1000 acre row.
2. Count number of plants; then multiply by 1000 to determine plants per acre.

### Determining Yields\*

1. Harvest grain from 1/1000 acre row.
2. Weigh harvested grain then multiply by 1000 to get pounds of grain per acre.
3. Determine moisture content then divide pounds per acre by pounds per bushel for adjusted moisture.

\* Average three or more 1/1000 acre rows for more accurate estimate of field populations and yields.

# NOTES

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