



University of Idaho
Extension

Pesticide Applicator Re-Certification Training

Dec 14th, 2014

Caldwell, ID

A large, stylized, light gray leaf graphic that curves from the top right towards the bottom center of the slide.

syngenta

Safety and efficacy of Syngenta products used in the Treasure Valley

Glenn Letendre

Agronomic Service Representative

Overview

- Dual Magnum for fall use for yellow nutsedge suppression.
- Reflex use on potatoes 24 (c) (Special Local Needs)
- Alfalfa seed desiccation
- Resistance management and maintaining use of product
- Tank-mixing
- Formulation differences
- Pollinator Protection Labeling

Fall application for control or suppression of yellow nutsedge

Limited uses in the PNW.

 **DualMagnum[®]**

syngenta[®]

Classification: NOT FOR DISTRIBUTION

TM

Yellow nutsedge

- Growing issue in Treasure Valley for several years
- Competitive nature of weed has permitted it to spread over large areas.



Classification: NOT FOR DISTRIBUTION



Classification: NOT FOR DISTRIBUTION

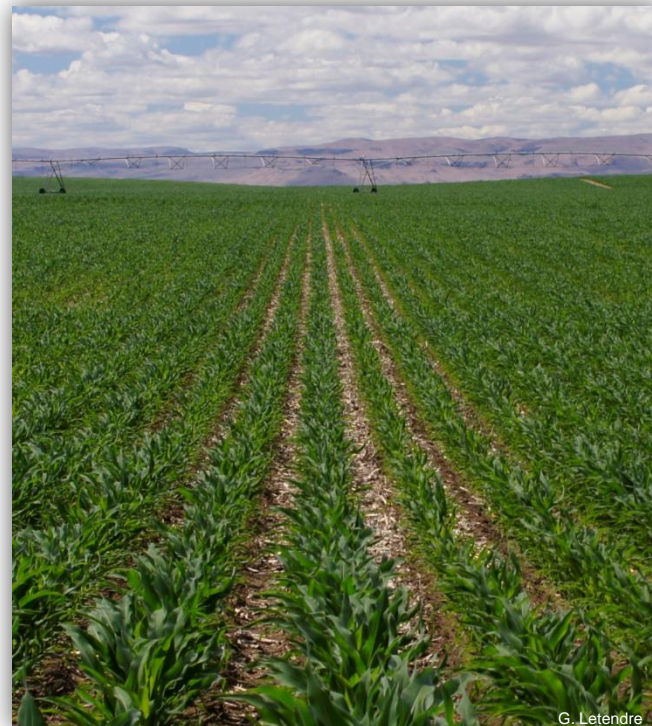
 **Dual Magnum[®]**

syngenta[®]

Section 3 label – Corn (all types)

Fall Application for control or suppression of yellow nutsedge (ID, OR and WA only):

- For pre-emergent control or suppression of yellow nutsedge the following spring, apply 1.33 pt./A of Dual Magnum in the fall after the harvest of the previous crop.
- Fall applications of Dual Magnum can be surface-applied or incorporated.
 - Do not exceed a 2 to 3-inch incorporation depth if tilled after treatment



Classification: NOT FOR DISTRIBUTION

Section 3 label – Corn (all types)

Fall Application for control or suppression of yellow nutsedge (ID, OR and WA only):

Restrictions:

- Make no more than one fall application per crop.
- Apply not more than 1.33 pt./A in a single fall preplant application.
- Do not apply to frozen ground.
- If a spring application is made, the combined total amount of Dual Magnum applied in the fall plus the spring must not exceed the maximum seasonal S-metolachlor rate for corn (3.9 pt./A depending on soil texture), or illegal residues may result.

Classification: NOT FOR DISTRIBUTION



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Fall-applied Dual in crops other than corn are covered under “Indemnified labels”

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SYNGENTA CROP PROTECTION, LLC INTENDS THAT THE PRODUCT THAT IS THE SUBJECT OF THIS SECTION 24(c) LABEL BE PURCHASED ONLY BY END USERS WHO AGREE BY ELECTRONIC SIGNATURE ON SYNGENTA CROP PROTECTION'S INTERNET SITE TO THE TERMS AND CONDITIONS REQUIRED BY SYNGENTA CROP PROTECTION, LLC INCLUDING A WAIVER AND RELEASE FROM ALL LIABILITY AND INDEMNIFICATION BY THE USER AND/OR GROWER OF SYNGENTA AND OTHERS FOR FAILURE TO PERFORM AND FOR CROP INJURY, CROP YIELD REDUCTION, AND/OR CROP LOSS FROM USE OF REFLEX HERBICIDE ON CROPS ON THIS 24(c) LABEL. IF SUCH TERMS AND CONDITIONS ARE UNACCEPTABLE, RETURN THE DUAL MAGNUM AT ONCE UNOPENED OR USE THE DUAL MAGNUM FOR A DIFFERENT APPROVED USE IN ACCORDANCE WITH THE LABEL AFFIXED TO THE PRODUCT CONTAINER.

USE OF DUAL MAGNUM (THE “PRODUCT”) ON CROPS LISTED (THE “CROP”) FOR THIS SPECIAL LOCAL NEED MAY RESULT IN CROP INJURY, CROP YIELD REDUCTION AND/OR CROP LOSS AS FURTHER DISCUSSED BELOW. READ AND UNDERSTAND THESE CONDITIONS AND RISKS OF USE FOR SPECIAL LOCAL NEED BEFORE USING THE PRODUCT ON THE CROP. SYNGENTA RECOMMENDS THAT THE USER TEST THIS PRODUCT TO DETERMINE ITS SUITABILITY FOR SUCH INTENDED USE.

Classification: NOT FOR DISTRIBUTION



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SLN 24(c) labels – Dry bulb onions

Fall application for control or suppression of yellow nutsedge
(ID and OR only):

- For pre-emergent control or suppression of yellow nutsedge the following spring, apply 1 - 1.33 pt./A of Dual Magnum in the fall after the harvest of the previous crop.
- Fall applications of Dual Magnum can be surface-applied or incorporated.
 - Do not exceed a 2 to 3-inch incorporation depth if tilled after treatment



G. Letendre

SLN 24(c) labels – Dry bulb onions

Fall application for control or suppression of yellow nutsedge
(ID and OR only):

Restrictions:

- Make no more than one fall application per crop.
- Apply not more than 1.33 pt./A in a single fall preplant application.
- Do not apply to frozen ground.
- To reduce the risk of crop injury, apply at least 100 days prior to the planting of onion (seed, sets, or transplants).

Classification: NOT FOR DISTRIBUTION



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SLN 24(c) labels – Dry bulb onions

Spring application for control or suppression of yellow nutsedge (ID and OR only):

- Apply to yellow nutsedge at 0.67 - 1.33 pt./A depending on soil type when onions are at two (2) true leaf stage.
- An additional application of 0.67 - 1.33 pt./A may be applied 21 days later, provided no fall application was made.
- If nutsedge is not the target, delaying Dual application to 3 true leaves may reduce the risk of crop injury.



Classification: NOT FOR DISTRIBUTION

Restrictions with respect to use on onions

- Do not apply within 60 days of harvest.
- Do not harvest green onions.
- Do not apply this product through any types of irrigation system.
- Do not graze animals on green forage or stubble.
- If Dual Magnum is applied in the fall for nutsedge, only one post-emergent application in onions at a maximum rate of 1.33 pt./A is allowed.
- Do not apply more than 2.66 pt./A to dry bulb onions as a combined total across all application timings and use patterns to produce that crop.

Classification: NOT FOR DISTRIBUTION



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Reflex – potato use in the PNW

Important information on its use



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Classification: NOT FOR DISTRIBUTION

TM

Historical use of Reflex on beans

- Reflex is a selective broadleaf herbicide that, for many years has been used to control over 50 weeds in soybeans, snap beans and dry beans in the eastern regions of the U.S.
 - Used primarily as a post-emergence herbicide in beans

Cell membrane disruptor

- Inhibition of protoporphyrinogen (PPO-inhibitor)
 - HRAC Group 14
 - acts primarily on lipids and proteins in the cell membranes of plant tissue
- Other examples
 - Aim, Chateau; Goal
- Translocated – yes, xylem mobile, contact activity post.
- Breakdown – microbial and photolysis
- Mainly effective on broadleaf weeds

Environmental Fate

- Adsorbs strongly to organic matter
- Photo decomposes slowly under field conditions
- No significant loss due to volatilization.
- Microbial breakdown is the main mechanism by which fomesafen is lost from the soil
- Decomposition occurs more rapidly under warm and moist soil conditions versus cold and dry conditions

Safety

- Signal word : **DANGER**
 - CORROSIVE. CAUSES IRREVERSIBLE EYE DAMAGE. DUE TO CORROSIVE NATURE, MAY BE HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
- Personal Protective Equipment (PPE)
 - Applicators and other handlers must wear:
 - Long-sleeved shirt and long pants
 - Chemical-resistant gloves such as barrier laminate or Viton®
 - Shoes plus socks
 - Protective eyewear
 - Restricted early entry (REI) = 24 hours.
 - Early re-entry requires protection similar to above.

PPO Inhibitor symptomology/injury



Corn



Cotton

- Contact burn
- Chlorosis then necrosis
- Plants that don't die, may be severely stunted for a couple of weeks
- Regrowth may occur

Classification: NOT FOR DISTRIBUTION

 **Reflex**[®]

 **syngenta**[®]

Symptomology (post-e)

- Contact burn
 - Cell membrane components are destroyed resulting in the desiccation of plant tissue
- Chlorosis then necrosis
 - Water soaked lesions on the leaf surface appear several hours following application
 - Leaves turn yellow and/or brown, shrivel and die in 1 to 3 days
- Plants that don't die, may be severely stunted for a couple of weeks
- Regrowth may occur

Use directions

- Use west of Mississippi limited to potatoes in designated counties in ID, OR and WA as well as summer and winter squash in 8 counties in western OR (indemnified label).
 - SLN 24(c) labels can be found at [FarmAssist.com](https://www.farmassist.com).
- Counties where Reflex may be applied on potatoes in the PNW.

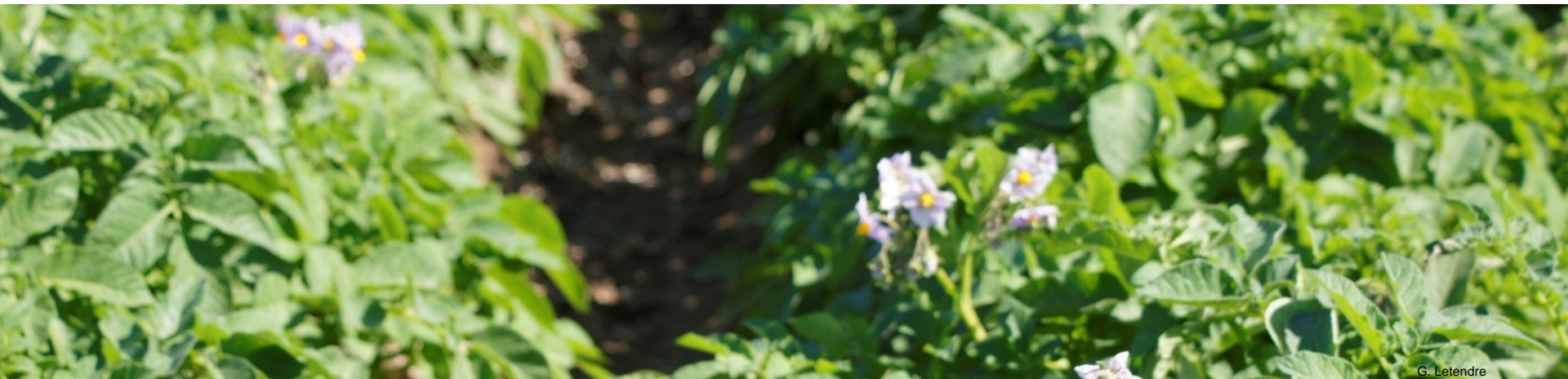
STATE	COUNTIES
IDAHO	Ada, Bingham, Bonneville, Canyon, Cassia, Clark, Elmore, Gooding, Jefferson, Jerome, Minidoka, Owyhee, Payette, Power and Twin Falls.
OREGON	Malheur, Morrow and Umatilla
WASHINGTON	Adams, Benton, Franklin and Grant

Use directions

- Use limited to potatoes grown under **overhead irrigation only**.
- Single rate: 1 pt./A
- Apply as a broadcast preemergence application after planting but before potatoes emerge
 - Varieties may vary in their response to Reflex. Always determine crop safety before use.
- Spray volumes
 - Use a minimum of 10 gal. of water/A by ground.
 - Use a minimum of 5 gal. of water/a by air.
- Adjuvants
 - Not required unless Reflex is being used in a burndown of emerged weeds.

Use directions

- Can be chemigated alone or in tank mix with other herbicide registered for chemigation use.
 - **Center pivot irrigation only.**
- Do not apply when wind speed favors drift beyond the area intended for treatment



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 **Reflex**[®]

 **syngenta**[®]

Use precautions

- Do not exceed 1 pint (0.25 lb ai) of Reflex per acre in any one year.
- Do not apply to any field more than once every two years.
- To prevent injury to rotational crops a minimum of 22 inches of cumulative irrigation must occur from the period following a Reflex application through potato harvest.
- Do not apply to fields with 2% or greater organic matter.
- Do not make a Reflex application after June 1.

Use precautions

- Do not harvest potatoes treated with Reflex within 70 days of application. (PHI=70 days)
- Do not apply to potatoes grown for seed.
- Do not apply Reflex to sweet potatoes or yams.
- Do not apply Reflex as a preplant incorporated application in potatoes or crop injury may occur.
- Do not apply to emerged potato plants or severe crop injury will occur.

Weed spectrum

Broadleaf weeds controlled @ 1 pt./A	Partially controlled
Amaranth, Palmer	Cocklebur, common
Lambsquarters, common	Morningglory
Morningglory, smallflower	Nightshade, hairy
Nightshade, black	Ragweed, common
Pigweed, redroot	Ragweed, giant
Purslane, common	Nutsedge, yellow

Classification: NOT FOR DISTRIBUTION



Use directions

- Best used in a tank mix with other herbicides registered for use in potatoes to enhance broadleaf control.
 - Examples: Dual Magnum[®], Boundary[®], Prowl[®] H₂O, Matrix[®], Outlook[®], metribuzin
- Follow the directions for use, observe the stated precautions, and abide by the limitations and restrictions on the most restrictive of the product labels.
 - Always conduct a compatibility test before attempting large-scale mixing.

Injury on potatoes due to misuse

- Do not apply to potatoes that have emerged.
- Avoid overlap when spraying the field.



Plant-back (Rotational crop restrictions)

Crop to be planted	Minimum rotational interval
Dry beans, potatoes, snap beans	0 days
Wheat ⁺	4 months [*]
All other crops	18 months ^{**}

*A successful field bioassay (refer to **FIELD BIOASSAY INSTRUCTIONS** section) must be performed before planting wheat.

A successful field bioassay (refer to **FIELD BIOASSAY INSTRUCTIONS section) must be performed before planting other rotational crops not listed in the table above

⁺ Do not graze rotated small grains or harvest forage or straw for livestock

Harvest aid
Alfalfa seed desiccation

Challenges facing alfalfa seed growers

Heavy crop canopy
Weed size and pressure

Coverage issue



For maximum desiccation of weeds and crop

Requires thorough coverage of both foliage and stems.

- Split applications may provide better results when the canopy is very dense.
- Allow 5 days between applications.
- Use a minimum of 20 to 25 gallons of spray solution per acre when applying by ground and a minimum of 5 gallons by air.
- Always use a non-ionic surfactant according to label instructions.



Recommendations/precautions and restrictions

- Apply using 2.5 to 4 pts./A. Use higher rates when alfalfa and/or weed canopy are dense.
- Do not make more than 2 applications per year.
- Do not apply when weather conditions favor drift from treated areas.
- Do not harvest until at least 4 days after application. (PHI= 4 days)
- Restricted entry interval (REI): 24 hours.
- Do not cut current year's alfalfa seed crop for hay or forage.
- No seed screening or any portion of the alfalfa seed plant may be used or distributed for food or feed purposes.



Recommendations



- Use rate 1.5 to 2 pts./A. (1 pt. on thin alfalfa stands).
- Do not harvest until at least 3 days after application. (PHI= 3 days)
- Do not feed or use any portion of the treated seed including seed, screenings, hay forage or stubble for food , feed or oil purposes.



Resistance management

“Everyone plays a role”

Resistance is something we all need to worry about

It's not just the other fellow's problem

Diseases:

- Pink rot resistance to mefenoxam
- Early blight resistance to strobilurins and some SDHI fungicides

Weeds:

- Wild oats and Italian ryegrass resistance to ACCase herbicides
- Ryegrass biotype in OR resistant to 4 herbicide groups
- Kochia, prickly lettuce and Russian Thistle resistance to Sus
- Prickly lettuce resistance to 2,4-D
 - <http://pnwhandbooks.org/weed/other-items/agrichemicals-and-their-properties/managing-herbicide-resistant-weeds>



Glyphosate resistance is in the area!

Glenn Letendre

So how do we prevent resistance from developing?

- Cultural practices
- Crop rotations
- **Product/ mode of action rotations**
- **Tank mixes/ multiple active ingredient formulations**

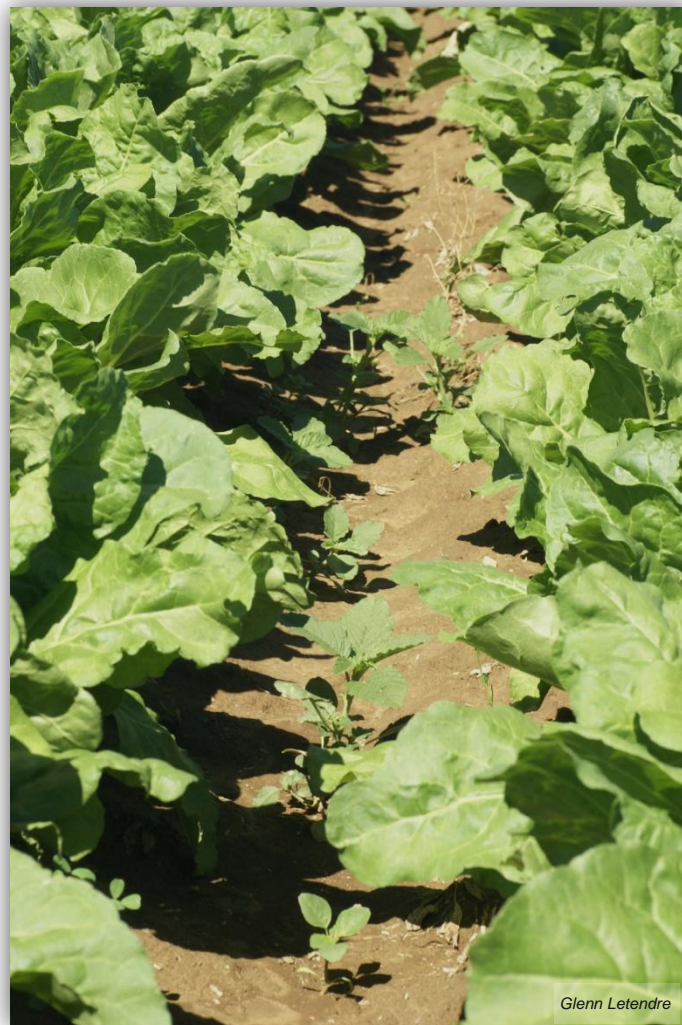


Sugarbeets



- Dual mode of action for optimal weed resistance management
- Premix of both knockdown (glyphosate) and residual (S-metolachlor) herbicides

Same applies in corn






Sequence benefits

- **Contact and residual weed control**
 - Effective contact plus residual weed control of more than 100 weeds
- **Two modes of action**
 - A premix of potassium glyphosate and S-metolachlor offers growers a dual-action herbicide to control troublesome weeds
- **Weed resistance management**
 - Sequence not only manages weeds more effectively, but also adds another mode of action to help combat glyphosate resistance
- **Yield increase**
 - Weed control programs containing Sequence have shown higher yields than those using only glyphosate alone



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Sugarbeet recommended timings

First Application	Second Application	Third Application
Crop Growth Stage		
		
2 to 4 Leaf Stage	6 to 8 Leaf Stage	8 Leaf to Canopy Closure
Touchdown Total	Sequence	Touchdown Total
Touchdown Total	Sequence	Sequence

Note: Apply Sequence as the second and/or third application is to avoid the possibility of injury to small sugar beet seedlings.



For effective control of powdery mildew, sugar beet growers rely on Inspire[®] XT fungicide.

The combination of two trusted triazoles provides reliable disease control.

(difenoconazole and propiconazole)

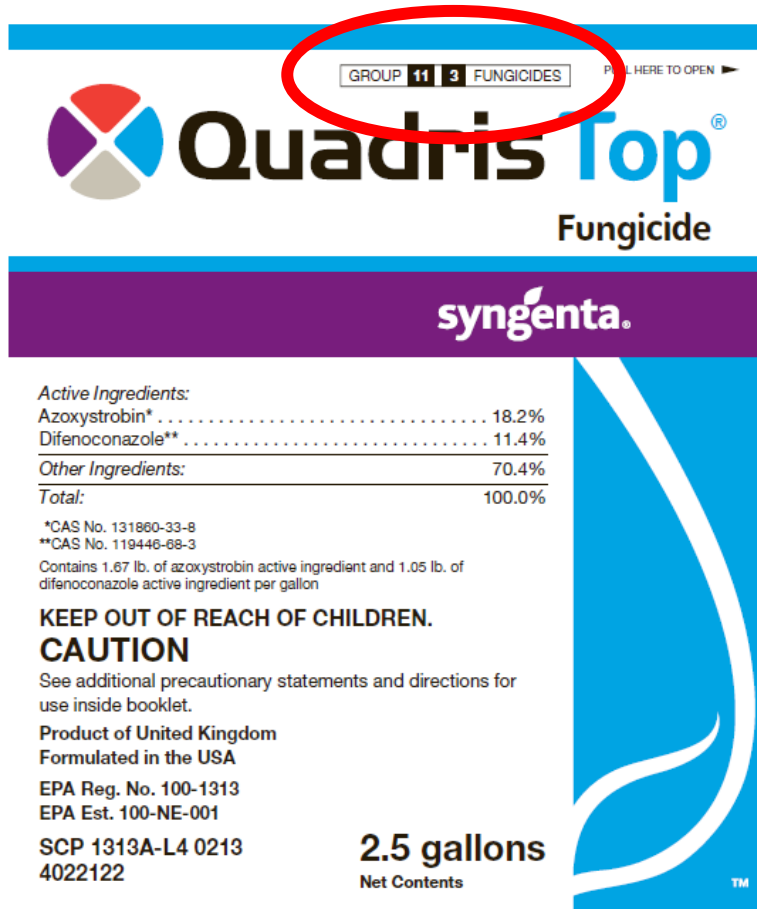
Label at a Glance

Crop	Disease	Use Rate	Directions for Use
Sugarbeets	Powdery mildew Cercospora leaf spot	7.0 oz.	Begin applications preventively or on a forecast system. For powdery mildew, apply at first sign of disease. Apply Inspire XT on a 10- to 21-day schedule. Use shorter intervals when disease pressure is high.

- Alternate Inspire XT with a non-triazole fungicide that is registered for use on sugar beets.
- **Make only 1 application of Inspire XT then alternate to a non-triazole fungicide (FRAC Group 3) registered for use in sugar beets.**

Avoid resistance by...

Following label guidelines for application of all pesticides. Many labels now include detailed information on resistance management along with a Group Code to help identify product families.



Avoid resistance by...

Following label guidelines for application of all pesticides. Many labels now include detailed information on resistance management along with a Group Code to help identify product families.



Crop	Target Diseases	Use Rate fl. oz. product/A	Remarks
Potatoes	Black Dot (<i>Colletotrichum coccodes</i>) Brown Spot (<i>Alternaria alternata</i>) Early Blight (<i>Alternaria solani</i>) Powdery Mildew (<i>Erysiphe cichoracearum</i>) Septoria Leaf Spot (<i>S. lycopersici</i>)	8-14	Begin applications prior to disease development and continue throughout the season on a 7- to 14-day interval. Make no more than 2 consecutive applications before switching to another effective fungicide with a different mode of action. The addition of a spreading/penetrating type adjuvant such as a non-ionic based surfactant or crop oil concentrate or blend is recommended. If disease pressure is high, use the shortest interval and highest rate. The addition of a spreading/penetrating type adjuvant may enhance efficacy.
Application: For best results, use sufficient water volume to provide thorough coverage. Quadris Top may be applied by ground, chemigation, or aerial application.			
Specific Use Restrictions: 1) Do not apply more than 55.3 fl. oz./A/season of Quadris Top. 2) Do not apply more than 0.46 lb. a.i./A/season of difenoconazole-containing products. 3) Do not apply more than 2.0 lb. a.i./A/season of azoxystrobin-containing products 4) Do not apply within 14 days of harvest (14-day PHI).			



Management of Resistant Weeds

Axial Star Herbicide contains a Group 1 (ACCase inhibitor) herbicide and Group 4 (synthetic auxin) herbicide. Some naturally occurring weed populations have been identified as resistant to Group 1 and 4 herbicides. Selection of resistant biotypes, through repeated use of these herbicides in the same field, may result in control failures. A resistant biotype may be present if poor performance cannot be attributed to adverse weather conditions or improper application methods. If resistance is suspected, contact your local Syngenta representative for assistance.

The following practices will delay selection for resistant populations of weeds:

- Apply postemergence herbicides to small, actively growing weeds.
- Ensure that good spray coverage is achieved with proper spray volumes and calibrated equipment.
- Use the full label rate of product.
- Avoid tank mixes that may cause antagonism and reduced weed control.
- Where possible, avoid the repeated use of herbicides with the same mode of action (i.e., same group number) in successive seasons either in cereal crops or rotational crops.
- Use a diverse crop/fallow rotation to extend the range of available herbicides and agronomic practices.
- Use cultivation, fertilizer regimens, seeding rates and row widths that enhance crop competitiveness.
- Prevent weed escapes from producing seed either in the crop or during fallow periods.

Tank mixing

“Success or disappointment”

Gramoxone on
alfalfa\Agimek
formulations, Axial tm

Tank mixing pesticides - adjuvants

- Always follow the label
 - Use recommended rates
 - Don't shave rates
 - Always read all labels used in tank mix
 - Always heed to the most restrictive
 - Efficacy
 - Crop safety
 - Adjuvant requirements
 - Use only adjuvant types recommended on the label
 - NIS, COC, MSO etc.
 - Use recommended rates
 - Use quality products
 - Chemical Producers and Distributors Assoc.-certified spray adjuvant.



Tank mixing pesticides - sequence

- Always follow the label
 - Observe tank mixing sequences

Mixing Instructions

1. Half fill spray tank with clean water. Start agitation or bypass system.
2. If a broadleaf herbicide mix partner is to be used, add the product **FIRST** prior to adding Axial Star Herbicide and agitate for 2-3 minutes.
3. Add correct amount of Axial Star Herbicide.
4. Agitate for 2-3 minutes before adding remainder of water and then maintain constant agitation.
5. After any break in spraying operations, agitate thoroughly before spraying again.
6. Use the spray solution as soon as it is prepared.

Tank-Mix Compatibility Test

A jar test is recommended prior to tank mixing to ensure compatibility of Axial Star Herbicide with mixture partners. Add proportion amounts of tank mixture components in a clear quart jar one at a time in the recommended mixing order. Gently shake or invert capped jar and let stand for 15-30 minutes. If the mixture clumps, forms flakes, oily films or layers or other precipitates, it is not compatible and the tank mixture should not be used.

Droplet size and drift control agent specific mixing considerations

WWW-WALE

- ☐ **W** – Water or fluid fertilizer go into the tank before anything else. Fill tank at least 1/4 full and start 'rolling' agitation.
- ☐ **W** – WSPs go into clean water before any other products.
- ☐ **W** – Next add WPs.
- ☐ **W** – Add WDGs.
- ☐ **A** – Maintain agitation during the mixing/spraying process. Allow each product to mix before adding new materials.
- ☐ **L** – Add Flowable (F), Suspension Concentrates (SC) or Soluble Liquids (SL).
- ☐ **E** – Add Emulsifiable Concentrates (EC).
- ☐ Complete filling of the tank with carrier.
- ☐ Lastly, add any surfactants such as NIS (when required by the label).
- ☐ Maintain agitation until all of the solution has been sprayed.

WSP	Water soluble packet
WDG/DF	Water dispersible granules/dry flowable
WP	Wettable powder
L = F, SC, SL	Liquid = flowable liquid, suspension concentrates, soluble liquid
E/EC	Emulsifiable concentrate
NIS	Non ionic surfactant

Tank mixing pesticides

- Always follow the label
 - Use recommended rates
 - Don't shave rates
 - Always read all labels used in tank mix
 - Always heed to the most restrictive
 - Efficacy
 - Crop safety
 - Observe tank mixing sequences
 - Adjuvant requirements
- Don't mix more than what will be applied that day
- Tank agitation
- Water volumes
- Fertilizers

Be aware of formulation differences

Check the label to be sure!

Always double-check the rate

- Many active ingredients are available in different forms
 - Different formulations
 - Concentrations
 - Adjuvants
 - Carriers/solvents, etc.
 - Different crops
- Always check the label on the product being used.

Example



0.15 lb. a.i./gal

Onion thrip – 8 to 16 fl. oz./A



0.7 lb. a.i./gal

Onion thrip – 1.75 to 3.5 fl. oz./A

EPA Pollinator Protection Labeling

Classification: PUBLIC – FOR PRESENTATION ONLY

Importance of pollinators

- 1 out of every 3 mouthfuls of food we eat is facilitated by insect pollination
- ~70% of top 100 food and fiber crops rely on insect pollination
- ~90% of wild plants use insect pollination for reproduction



EPA – Pollinator Protection Labeling

- Pollinator Protection Labeling required for foliar applied products containing clothianidin, dinotefuran, imidacloprid and thiamethoxam in 2014 use season
- Addition to current pollinator protection language on labels
- Syngenta has added new Pollinator Protection Labeling on following products:



Syngenta global program

- Creating essential habitats to restore pollinator populations on farms and other landscapes
- Utilizes practical, cost-effective practices that address pollinator needs at local level
- Based on scientific research – plant mixtures, plot maintenance & pollinator populations

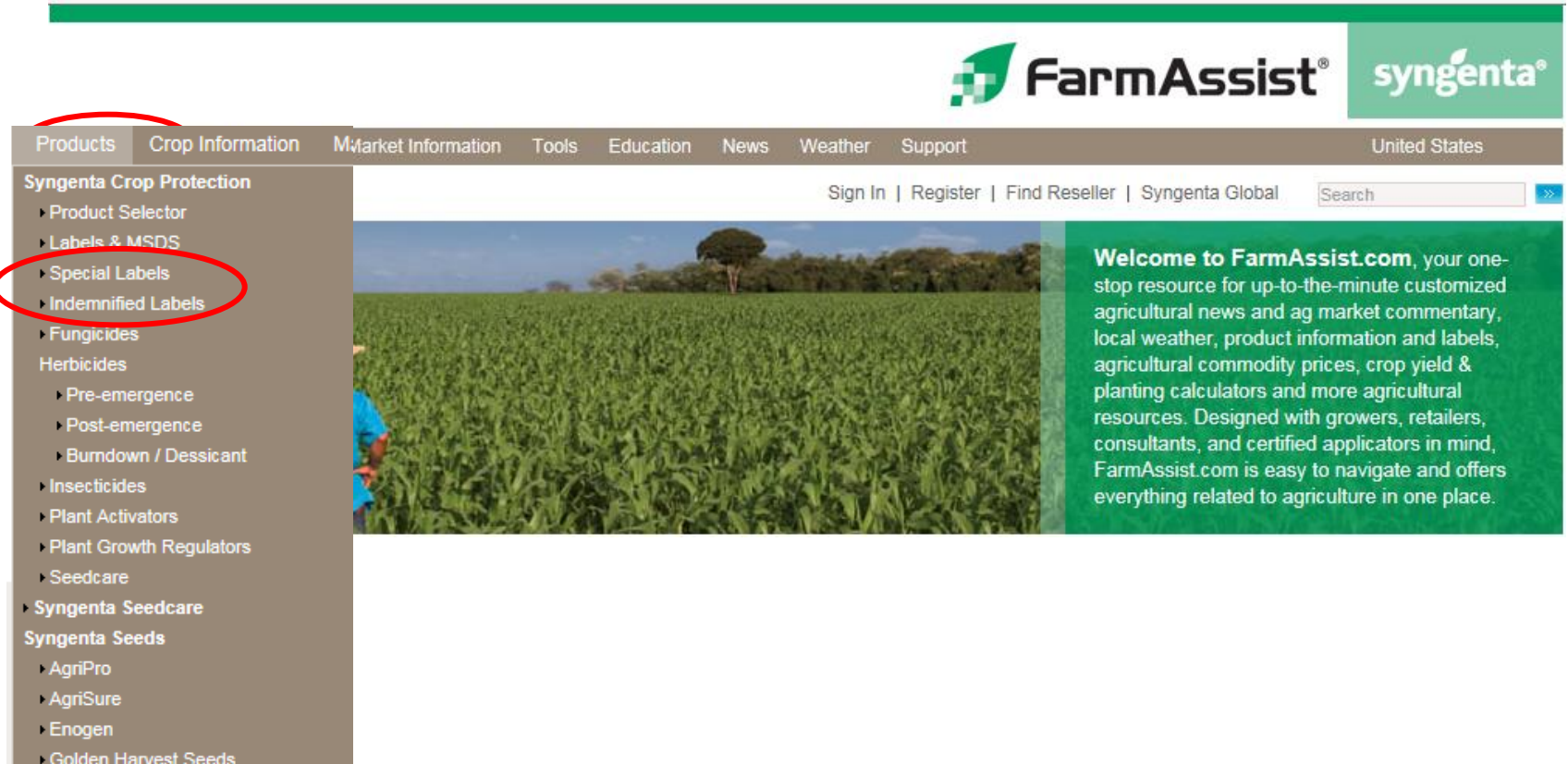
www.BeeHealth.org

www.plightofthebees.com

www.operationpollinator.com

Product labels

- <http://www.farmassist.com/>



Recap

- Dual Magnum for fall use for yellow nutsedge suppression.
 - Rate 1.33 pt./A, not on frozen ground, specific to certain crops
- Reflex use on potatoes 24 (c) (Special Local Needs)
 - Crop rotations, irrigation requirements
- Alfalfa seed desiccation
 - Coverage/split applications, two products
- Resistance management and maintaining use of product
 - Read the labels, shake it up.
- Tank-mixing
 - Read the whole label, ask when in doubt
- Formulation differences
- Pollinator Protection Labeling

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Actara, Agri-Mek, Agri-Mek 0.15EC, Besiege, Centric, Centric 40WG, Curacron, Curacron 8E, Denim, Durivo, Endigo ZC, Karate with Zeon Technology, Karate EC, Platinum, Platinum 75SG, Proclaim, Voliam Flexi, Voliam Xpress, Warrior with Zeon Technology, and Warrior II with Zeon Technology are highly toxic to bees exposed to direct treatment or to residues on blooming crops and weeds. Do not apply these products or allow them to drift onto blooming plants if bees are foraging in the treated area.

Some seed treatment offers are separately registered products applied to the seed as a combined slurry. Always read individual product labels and treater instructions before combining and applying component products.

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