

Pesticide Applicator Recertification Training

150 years

 **BASF**
We create chemistry

Wednesday, December 13, 2017

John Ihli



Alfalfa

150 years

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Registered Products

150 years



Herbicides	Fungicides	Insecticides
Sharpen	Endura	Fastac
Poast	Headline SC	
Prowl H2O	Pristine	
Pursuit	Priaxor	
Raptor		

Herbicide Terminology

Preemergence vs Postemergence

- **Pre-emergence:** Controls the weed before it emerges from the soil. These products have residual soil activity and are applied to the soil before weeds emerge. Germinating seedlings take up the product through the root and/or shoot.
 - Ex. Prowl H2O, Outlook
- **Post-emergence:** Controls the weed after it emerges from the soil. These products are applied directly to the foliage of the weed.
 - Ex. Raptor, Pursuit



“Which one should I use?”

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“Which one should I use?”

150 years



Do you have broadleaf weeds only?

Are there any grass weeds present?

Are lambsquarters a concern?

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Alfalfa Herbicides

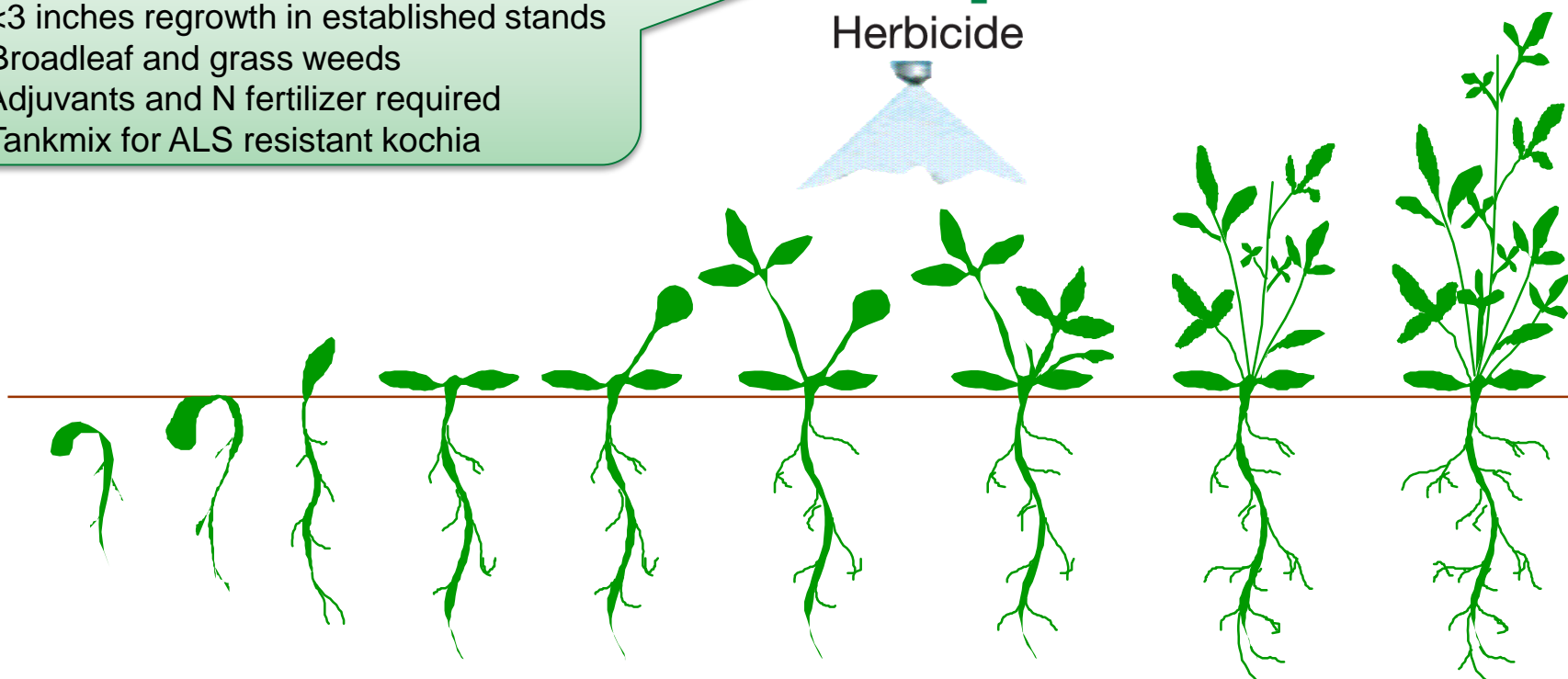
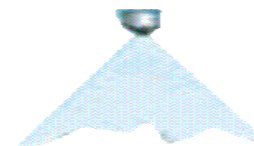
Seedling and Established

- 2 trifoliolate leaf alfalfa, 30 day PHI
- <3 inches regrowth in established stands
- Adjuvants and N fertilizer required
- Tankmix for ALS resistant kochia
- Lengthy plant back restrictions

Pursuit®
Herbicide

- 2 trifoliolate leaf alfalfa, 0 day PHI
- <3 inches regrowth in established stands
- Broadleaf and grass weeds
- Adjuvants and N fertilizer required
- Tankmix for ALS resistant kochia

Raptor®
Herbicide



RAPTOR

150 years



Alfalfa (forage)

Weeds Controlled	Broadleaf and grass post-emergence weed control
Application Method	Ground: ≥ 10 GPA, Air: ≥ 5 GPA
Rates	4-6 oz./A
Timing	After second trifoliate is emerged
REI	4 hours
PHI	0 days,
Adjuvant Use	Adjuvants and N required

PURSUIT

150 years



Alfalfa (forage)

Weeds Controlled	Broadleaf and grass post-emergence weed control
Application Method	Ground: ≥ 10 GPA, Air: ≥ 5 GPA
Rates	3-6 oz./A
Timing	After second trifoliate is emerged
REI	4 hours
PHI	30 days,
Adjuvant Use	Adjuvants and N required

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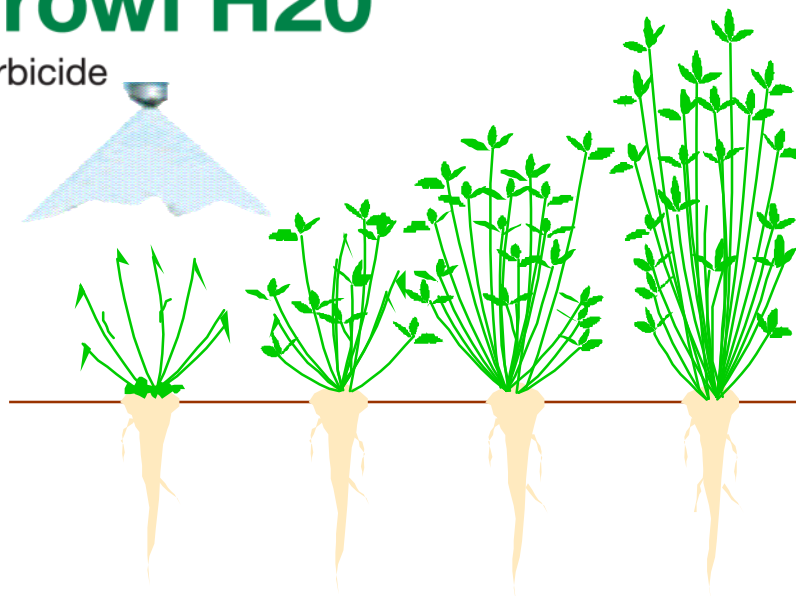
Alfalfa Herbicides

Seedling and Established

- Minimum 2 trifoliate leaves (seedling)
- Less than 6 inches of regrowth (established)
- 1.1 - 4.2 qt./A
- **28 day PHI w/ < 2.1 qt. or 50 days with higher rates****
- Residual weed control
- Must be incorporated

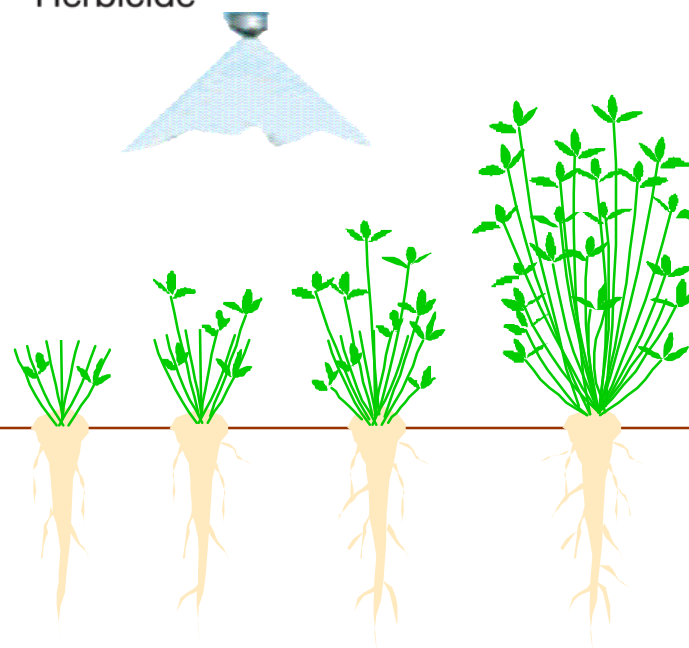
Prowl H2O[®]

Herbicide



Prowl H2O[®]

Herbicide



Prowl Residual Activity

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Untreated



Raptor (4.0 oz./A) + Prowl H2O (2.4 qt./A)

Prowl Residual Activity

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Weeds Controlled

- Barnyardgrass
- Chickweed, common¹
- Common lambsquarters
- Dodder²
- Foxtail species
- Henbit
- Kochia
- Pigweed species
- Puncturevine¹
- Purslane

¹ Controlled with rates above 4 pt/A

² Use highest labeled rate for control

See label for the complete list of weeds controlled or suppressed.

Best Use Recommendations

Application and Incorporation

- For best results apply by ground in 15–20 gpa or by chemigation in a minimum of 0.5–0.6" total water volume on coarse soils and 0.6–0.75" on medium to fine soils.
- Prowl H2O herbicide will provide the most effective weed control when incorporated with rainfall or overhead irrigation prior to weed germination.



Raptor (4.0 oz./A) + Prowl H2O (2.4 qt./A)

Prowl Residual Activity

150 years



Weeds Controlled

- Barnyardgrass
- Chickweed, common¹
- Common lambsquarters
- Dodder²
- Foxtail species
- Henbit
- Kochia
- Pigweed species
- Puncturevine¹
- Purslane

¹ Controlled with rates above 4 pt/A

² Use highest labeled rate for control

See label for the complete list of weeds controlled or suppressed.

Best Use Recommendations

Application and Incorporation

- For best results apply by ground in 15–20 gpa or by chemigation in a minimum of 0.5–0.6" total water volume on coarse soils and 0.6–0.75" on medium to fine soils.
- Prowl H2O herbicide will provide the most effective weed control when incorporated with rainfall or overhead irrigation prior to weed germination.

GLYPHOSATE RESISTANCE

- KOCHIA
- ITALIAN RYEGRASS
- ANNUAL BLUEGRASS

150 years

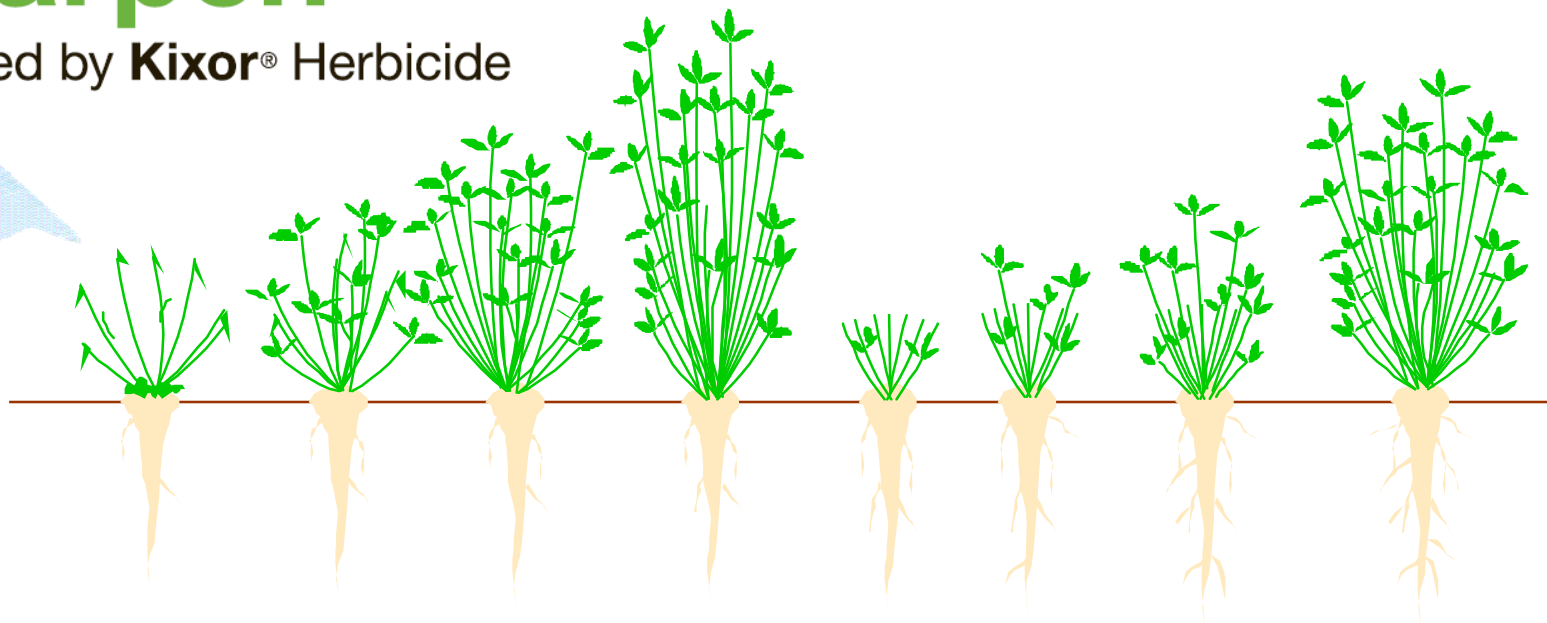
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Alfalfa Herbicides Established Hay

- Dormant Spray Period
- Burndown & Residual Herbicide
- 1.0 – 2.0 oz./ Acre
- 28 day PHI, Recommended 90 days prior to 1st cutting
- Controls Broadleaves only, by contact
- Labeled as Caution, safer than Gramaxone

Sharpen®

Powered by **Kixor®** Herbicide



Sharpen®/ Prowl® H₂O

Dormancy Spray in Alfalfa



Control: Shepherds Purse, Sticky Chickweed, Italian Ryegrass
Suppress/Control: Dandelion, Buckhorn Plantain

2 oz./acre Sharpen
2 qts./acre Prowl H₂O
1% MSO
57 DAT



Sharpen® Herbicide



Alfalfa (forage)

Weeds Controlled	Broadleaf weed burndown and residual activity
Application Method	Ground: ≥ 10 GPA, Air: ≥ 3 GPA
Rates	1-2 oz./A
Timing	Dormancy
REI	12 hours
PHI	28 days, Application must be 90 days prior to first cutting
Adjuvant Use	Add an MSO @ 1% v/v

Prowl H2O

150 years



Active Ingredient*:

pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7%

Other Ingredients: 61.3%

Total: 100.0%

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of waterproof material
such as butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, or
neoprene rubber ≥ 14 mils
- Shoes plus socks

REI = 24 HOURS

DO NOT enter or allow worker entry into treated areas
during the restricted-entry interval (REI) of **24 hours**.

Sharpen

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Active Ingredient:

saflufenacil: N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide 29.74%

Other Ingredients: 70.26%

Total: 100.00%

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves (such as natural rubber)
- Protective eyewear such as face shield, goggles, or safety glasses

REI = 12 HOURS

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **12 hours**.

Raptor

Active Ingredient:

ammonium salt of imazamox: 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid* 12.1%

Other Ingredients: 87.9%

Total: 100.0%

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, natural rubber (includes natural rubber blends and laminates) ≥ 14 mils, polyethylene, polyvinyl chloride (PVC) ≥ 14 mils, or viton ≥ 14 mils
- Shoes plus socks

REI = 4 HOURS

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **4 hours**.

Pursuit

150 years



Active Ingredient:

ammonium salt of imazethapyr: (\pm)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid* . . . 22.87%

Other Ingredients: 77.13%

Total: 100.00%

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate, butyl rubber \geq 14 mils, nitrile rubber \geq 14 mils, neoprene rubber \geq 14 mils, natural rubber (includes natural rubber blends and laminates) \geq 14 mils, polyethylene, polyvinyl chloride (PVC) \geq 14 mils, or viton \geq 14 mils
- Shoes plus socks

REI = 4 HOURS

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **4 hours**.

Are Diseases Present in Alfalfa?

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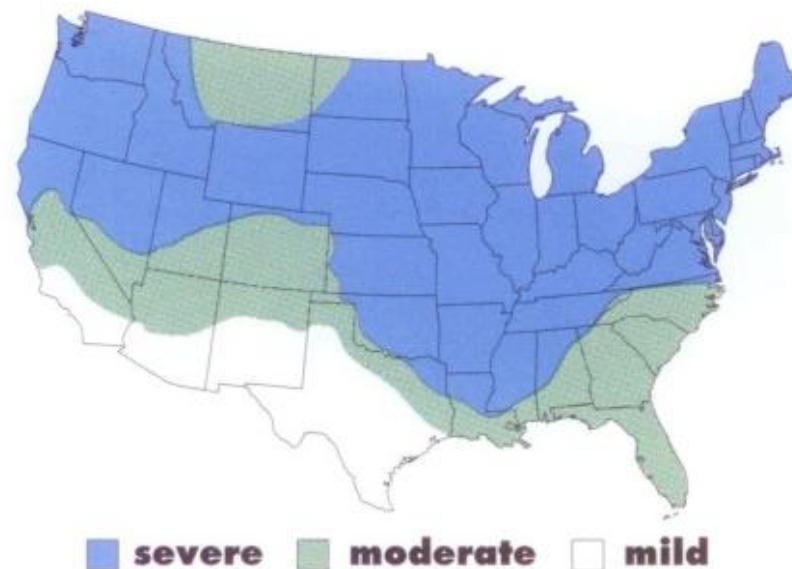
Distribution and severity

Common leaf spot



Distribution and severity

Spring black stem







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Alfalfa Fungicides (forage and seed)

- Multiple diseases
- 6 oz./A + NIS, 4-8 inches tall
- 14 day PHI

- Multiple diseases
- Forage: 6.5 oz./A with MSO/Silicon
- Seed: 6.0 – 11.0 oz./A with MSO/Silicon
- 4-8 inch tall, 10-30% bloom (seed)
- 14 day PHI

- Multiple diseases
- 12-18 oz./A with MSO/Silicon
- 4-8 inches tall, 10-30% bloom (seed)
- 14 day PHI

Headline®

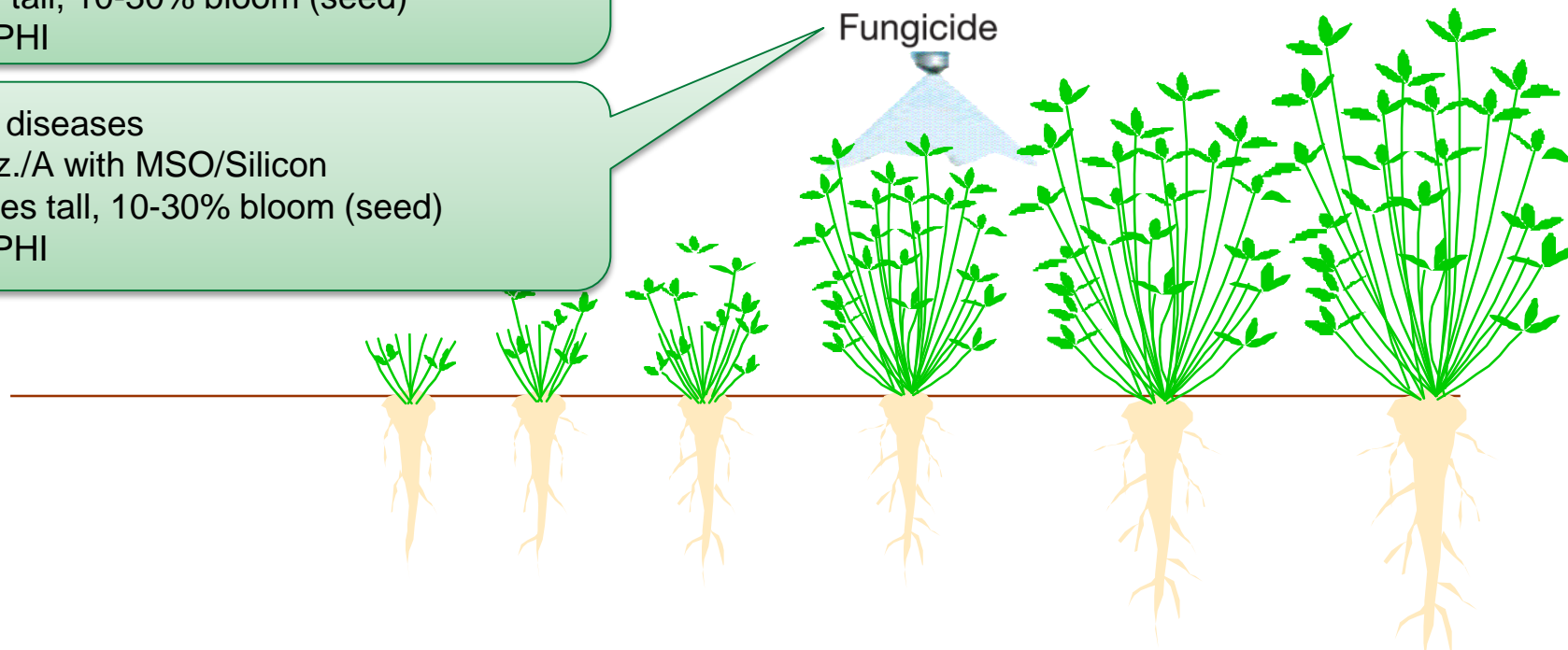
Fungicide

Endura®

Fungicide

Pristine®

Fungicide



150 years

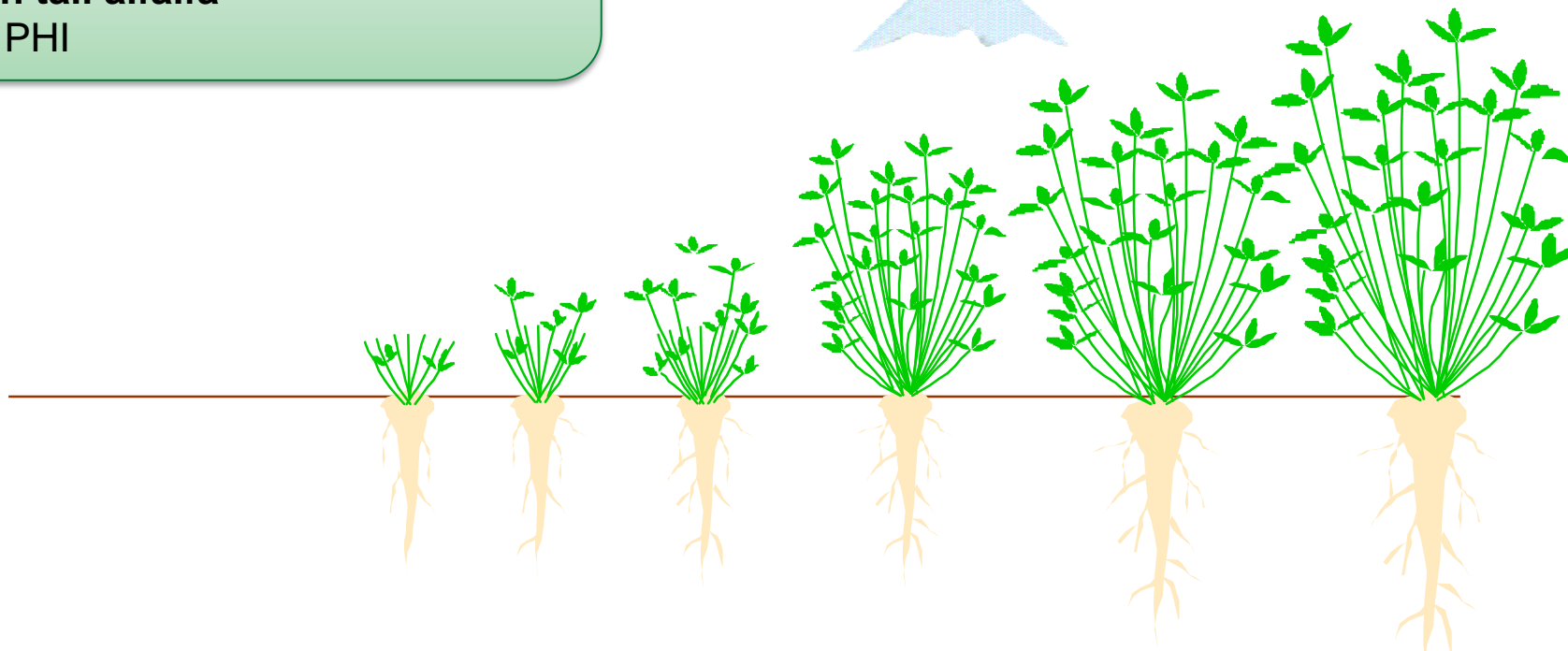
 **BASF**
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Alfalfa Fungicide

- Multiple diseases
- 4 oz./A + NIS
- Ground, Chemigation, Air
- **4-8 inch tall alfalfa**
- 14 day PHI

Priaxor®

Xemium® Brand Fungicide



Priaxor

150 years

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Priaxor®

Xemium® Brand Fungicide

For disease control and plant health in the following crops: barley, Brassica leafy vegetables, corn (all types), cotton, dried shelled peas and beans, edible-podded legume vegetables, fruiting vegetables (including tomato), oats, oilseed crops (flax seed, rapeseed, safflower, and sunflower), peanut, rye, sorghum and millet, soybean, succulent shelled peas and beans, sugar beet, sugarcane, tuberous and corm vegetables (potato), wheat and triticale

Powered by **Xemium®** and **F500®** fungicides

Active Ingredients:

fluxapyroxad*: 1*H*-Pyrazole-4-carboxamide, 3-(difluoromethyl)-
1-methyl-N-(3',4',5'-trifluoro[1,1'-biphenyl]-2-yl)- 14.33%
pyraclostrobin**: (carbamic acid, [2-[[[1-(4-chlorophenyl)-
1*H*-pyrazol-3-yl]oxy)methyl]phenyl]methoxy-, methyl ester). 28.58%

Other Ingredients: 57.09%

Total: 100.00%

Priaxor® Fungicide



F500® Fungicide
the active ingredient in:

Headline®

Fungicide



+



Xemium®

Fungicide

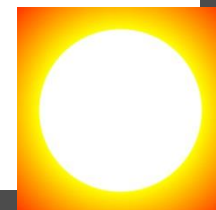
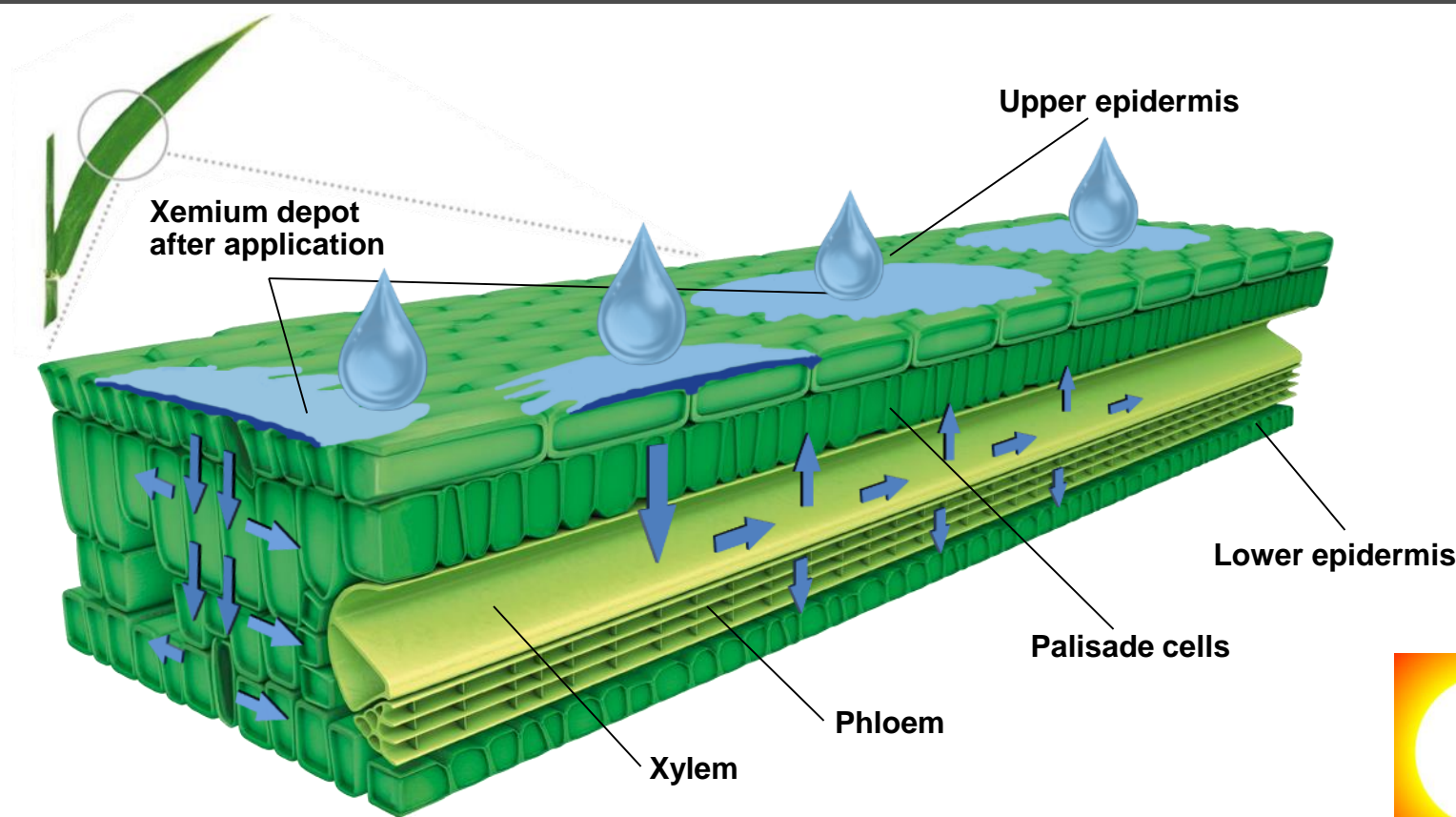
Combining two Unique Active Ingredients

Priaxor® Fungicide



- New Mode of Action for Alfalfa
 - Longer Lasting & More Consistent
 - Advanced Plant Health Benefits

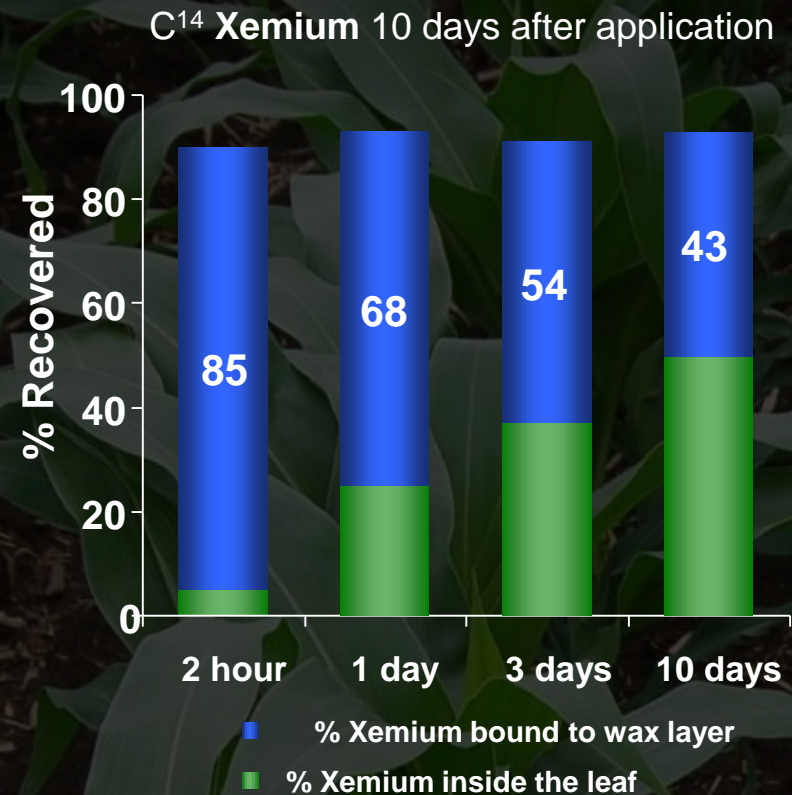
Present & Available: Depots and Systemicity



Xemium[®] fungicide: Continuous Release Over Time



- **Xemium** applied to leaf
- Moves to waxy cuticle immediately
- **Xemium** is slowly released into the transpiration stream
- 43% remains in the depot 10 days after application



Continuous release of Xemium for redistribution in the leaf

150 years



Impact of Fungicide on Alfalfa

Improved Leaf Retention

5/30/14 – Photo Taken 32 DAT – Enterprise, UT #2

Primary disease: Spring black stem



Headline
Fungicide

6.0 oz./A
Applied @ 6" regrowth

Untreated

150 years

Impact of Fungicide on Alfalfa

Improved Leaf Retention

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5/30/14 – Photo Taken 32 DAT – Enterprise, UT #2

Primary disease: Spring black stem



Headline® 6.0 oz./A
Fungicide Applied @ 6" regrowth

Untreated

150 years



Plant Health in Alfalfa

6/2/2015, – 28 Days After Treatment– Cedar City, UT

Primary diseases: Spring Black Stem, Common Leaf Spot



Untreated



**6oz/A Headline SC + Powerlock
Chemigated (0.25" water) at 6" regrowth**

Improved Leaf Retention and Plant Health

150 years



Plant Health in Alfalfa

6/2/2015, – 28 Days After Treatment– Cedar City, UT

Primary diseases: Spring Black Stem, Common Leaf Spot



Untreated

Improved Leaf Retention and Plant Health

150 years



Plant Health in Alfalfa

6/2/2015, – 28 Days After Treatment– Cedar City, UT

Primary diseases: Spring Black Stem, Common Leaf Spot



**6oz/A Headline SC
+ Powerlock**

Improved Leaf Retention and Plant Health

Plant health benefits in alfalfa

14 Days after treatment, freeze occurred five days before photo – Kinsley, KS



Headline (6 fl. oz./A)

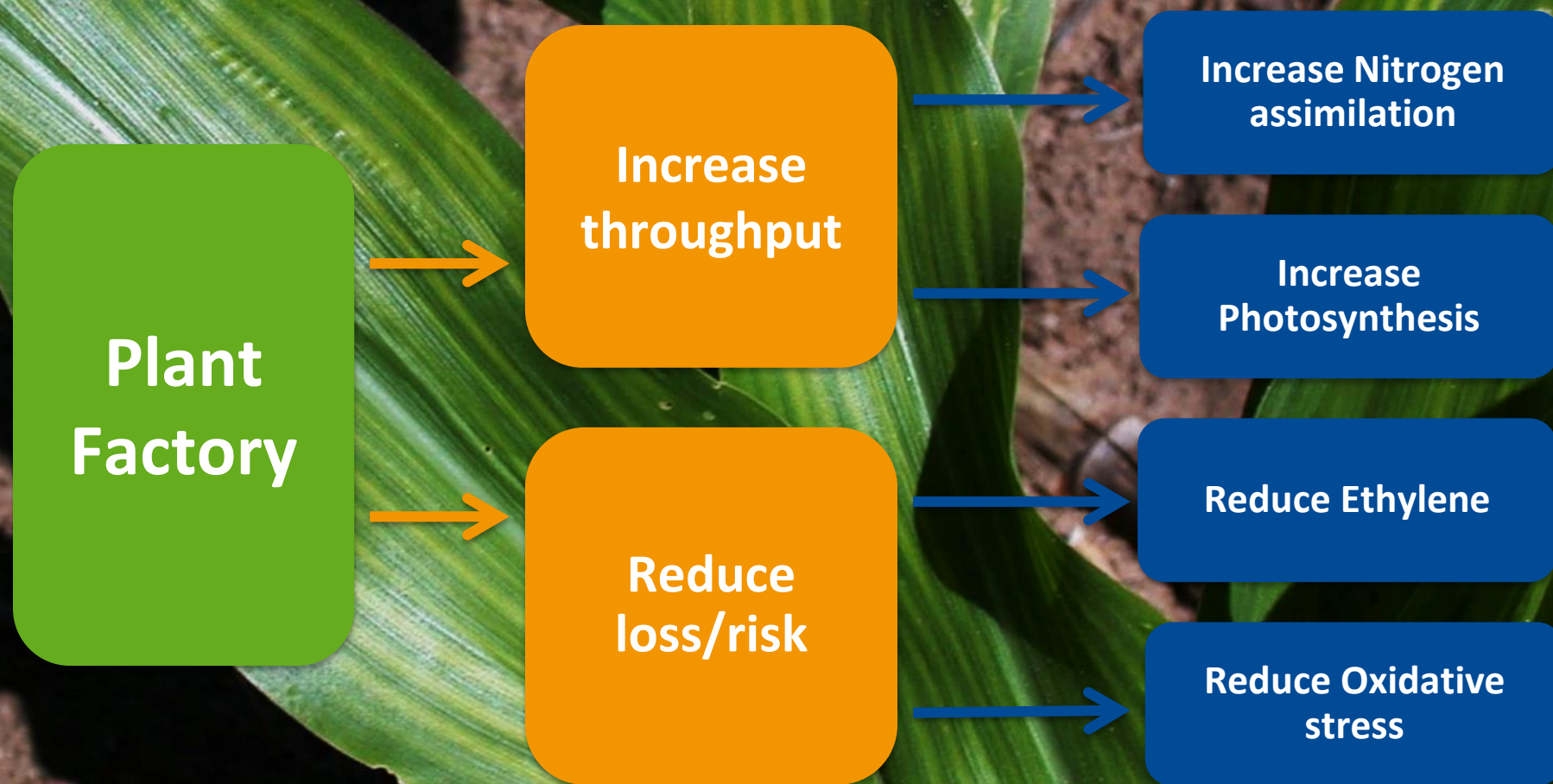


Untreated



Stress mitigation after a hard freeze

How would you increase yield/output of your plant factory?



Headline AMP® Fungicide

Corn plant never wants to have a bad day

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Day 1

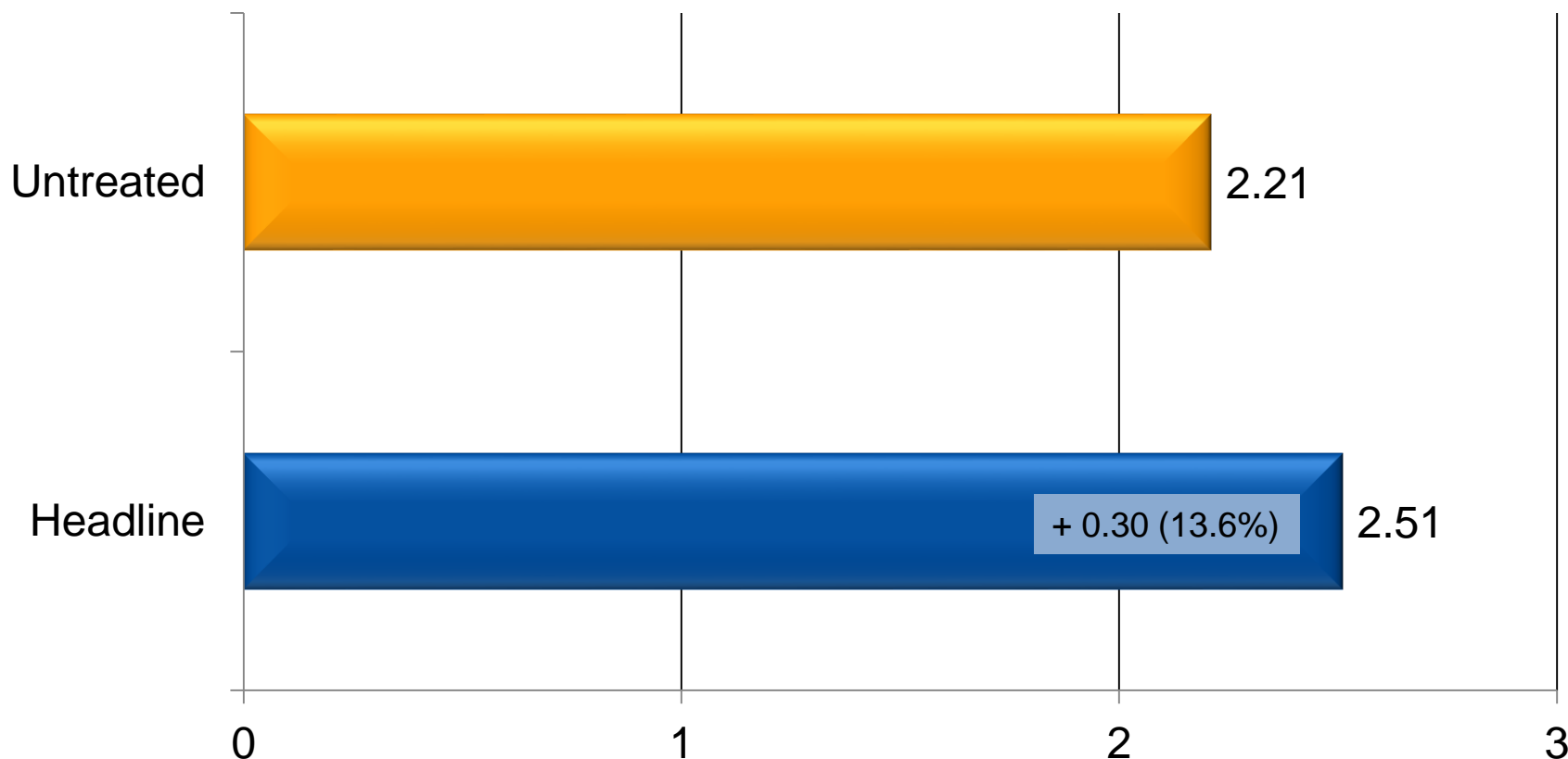
All Plants Watered to Field Capacity



Headline AMP provides greatest protection against stress

Impact of Fungicide on Alfalfa Yield 2011-2013 (12 Locations)

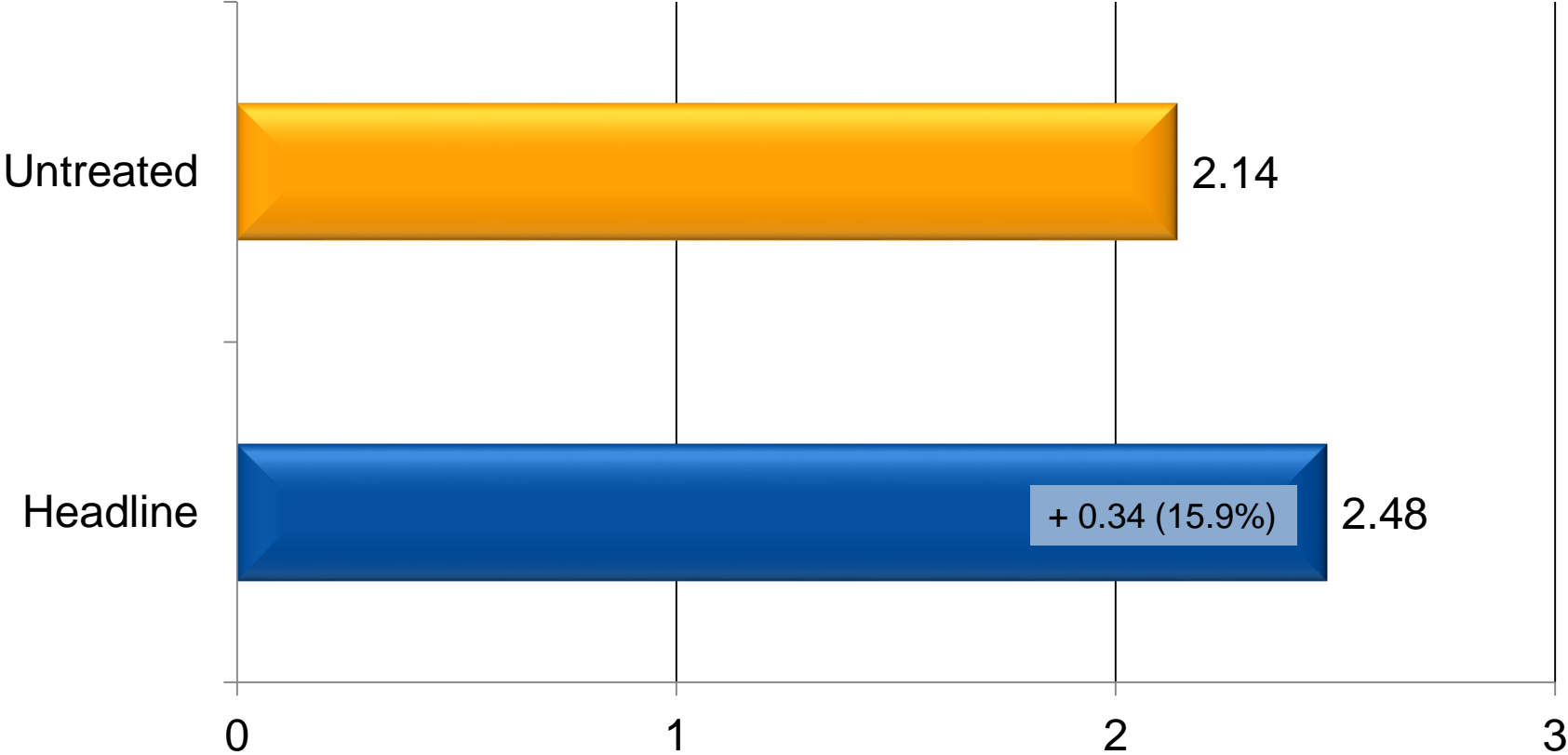
Yield (T/A) – First Cutting



2011-13. 12 commercial side by side and replicated commercial studies in ID and MT. Headline at 6.0 oz./A applied to 4-6 inch growth in spring prior to first cutting only. Headline SC: 6.0 oz.

Impact of Fungicide on Alfalfa Yield 2011-2013 (16 Locations)

Yield (T/A) – First Cutting



2011-13. 16 commercial side-by-side and replicated commercial studies in ID, WA, N. CA and MT. Headline SC at 6.0 oz./A applied to 4-6 inch growth by ground or chemigation in spring prior to first or second cutting only.

Priaxor® Fungicide



Alfalfa (forage and seed)

Diseases Controlled	Anthracnose, Rust, Spring and summer black stem and leaf spot, Common leaf spot, Powdery mildew, Yellow leaf blotch, Stemphyllium leaf spot, Downy mildew, Rhizoctonia, Stagnospora leaf spot
Application Method	Ground: ≥ 10 GPA, Air: ≥ 5 GPA, Chemigation (< 0.50 inch)
Rates	4 oz./A
Timing	Apply prior to disease development, 4-6 inches of re-growth
REI	12 hours
PHI	14 days
Adjuvant Use	Add an NIS @ 0.25% v/v to maximize coverage.

150 years



Priaxor[®] Fungicide

**Grower testimonial - tassel timing – Hope ND
11 days after frost event**



untreated



Priaxor[®] Fungicide

Grower reported differences viewed. Fields are located ½ mile apart. Much less frost on treated. Photo taken on 9/24/2014. Frost event occurred 9/13/2014. Priaxor applied at tassel timing.



PRIAXOR

150 years

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Active Ingredients:

fluxapyroxad*: 1 <i>H</i> -Pyrazole-4-carboxamide, 3-(difluoromethyl)- 1-methyl-N-(3',4',5'-trifluoro[1,1'-biphenyl]-2-yl)-	14.33%
pyraclostrobin**: (carbamic acid, [2-[[[1-(4-chlorophenyl)- 1 <i>H</i> -pyrazol-3-yl]oxy]methyl]phenyl]methoxy-, methyl ester).	28.58%

Other Ingredients: 57.09%

Total: 100.00%

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

Follow the manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

REI = 12 HOURS

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **12 hours**.

Registered Products for Grass(Forage)

150 years



Herbicides	Fungicides	Insecticides
Sharpen		
Clarity		
Prowl H2O		
Distinct		
Facet L		

Prowl[®] H₂O Herbicide

Your Foundation for Weed Control in Cool-Season Grasses

Benefits of Prowl[®] H₂O Herbicide

- Controls over 50 important grass and broadleaf weeds
- Water-based encapsulation easily washes off residue to control germinating weeds
- Improved stability on soil surface provides long lasting barrier preventing weed emergence in both wet and dry conditions

Prowl[®] H₂O Herbicide

Best Use Recommendations

Application Methods and Timing

- Apply by ground or chemigation, by air, or on dry bulk fertilizer
- Broadcast rate of 1.1 – 4.2 quarts/A in single or sequential applications
- May be applied in a sequential use program or tank-mixed with other herbicides. Refer to label for details.

Solid Stand

- Solid stands of established (with 6 or more tillers/plant) perennial cool-season forage grasses
- Grasses grown for forage, green chop, silage, hay production, and/or grown in pastures or rangeland for livestock grazing
- Apply prior to weed germination in the fall after last cutting/mowing/grazing, in winter, in the spring, or in-season between cuttings

Sharpen® Herbicide

150 years



Grass (forage)

Weeds Controlled	Broadleaf weed burndown and residual activity
Application Method	Ground: ≥ 10 GPA, Air: ≥ 3 GPA
Rates	1-2 oz./A
Timing	Only to established stands(Post), PPT, PRE,
REI	12 hours
PHI	0 Days
Adjuvant Use	Add an MSO @ 1% v/v , no AMS on Post app.