

Pesticide Product Update Joel Fields



WILBUR-ELLIS
AGRIBUSINESS

Supply Chain Updates

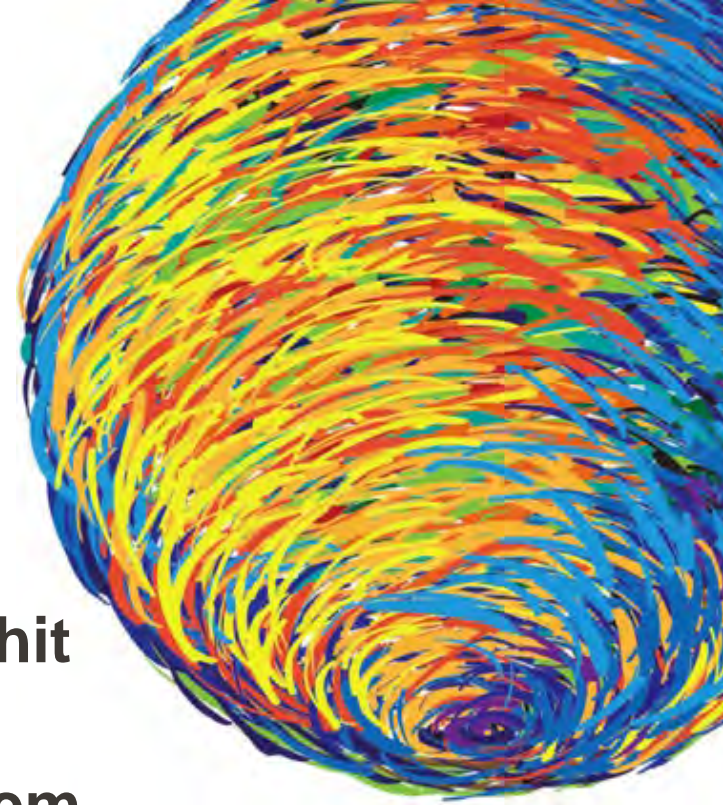
Supply in 2022

Olympics in China reduced manufacturing of several AI's and mining of yellow phosphorus, a raw ingredient in glyphosate.

Bayer's Luling, LA gly plant and surrounding areas were hit by a hurricane in late summer.

Container shortages and port congestion are still a problem due to increased American consumer demand during the pandemic.

Glyphosate shortages are putting significant pressure on glufosinate, clethodim, phenoxies (LV6 and other esters are particularly short, amines are doing okay although have increased in price).



Supply in 2022

Imazapyr inert ingredients are in tight supply through 2022

Aminopyralid R&P products are tight through Q1. No known issues regarding VM products.

Diuron likely to be phased out in the next 18 months

Russian invasion of Ukraine is likely to have negative effects on the fertilizer market, Russia is a major producer of natural gas.

Bayer ES is scheduled to be divested from Bayer Crop Science

Trucking is hard to find and slow-plan accordingly





OIL - BLEND

EFFICAX[®]

What is it?

1. Increased coverage, absorption and adhesion of spray material deposits
2. Improves the residual activity of most soil applied herbicides
3. Excellent tank mix compatibility
4. Increased deposition, providing better coverage
5. Qualifies as a drift reduction additive
6. Some studies show increased safety to crop as it prevents movement of herbicide into crop root zone

Proper Mixing Order



Mixing Instructions | EFFICAX®




Add EFFICAX to the spray tank LAST after all other products have been added and allowed to thoroughly mix and mixing equipment has been flushed.

When in doubt follow the WALES and DALES for optimum tank mix compatibility.

Every Tank Every Time®



 wilburellisagribusiness.com

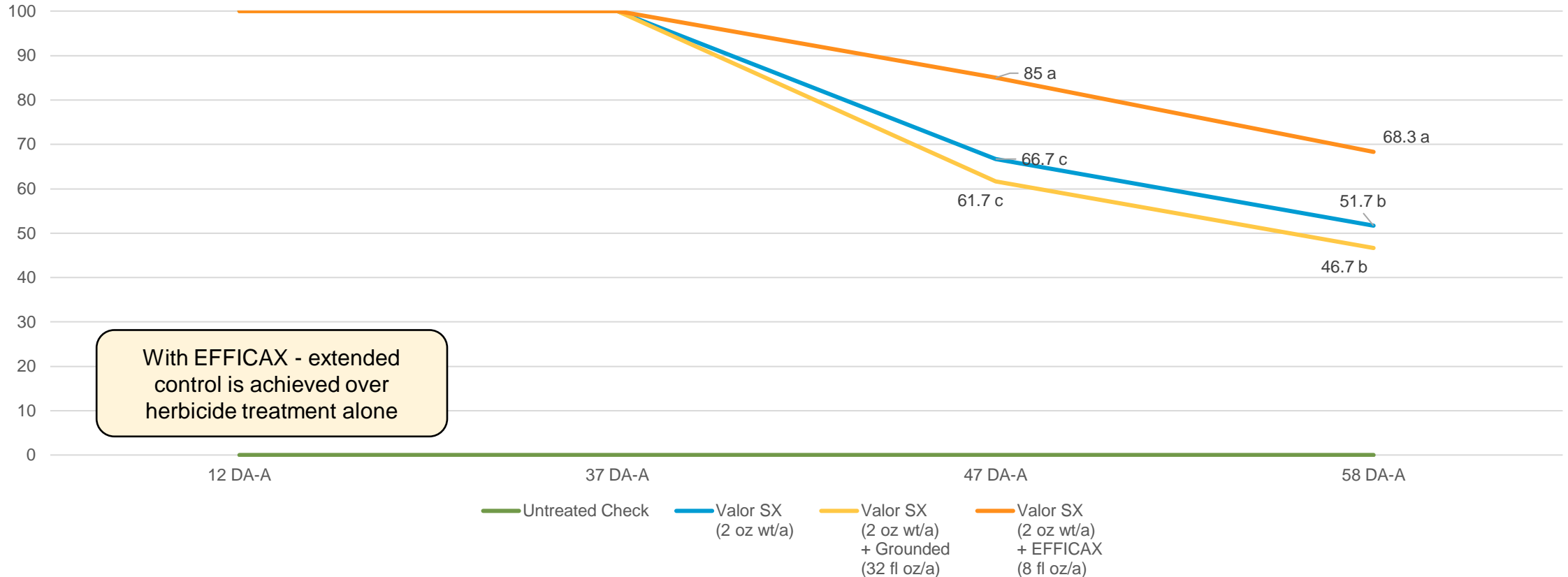


This is for informational purposes only and does not replace any language or instructions on the label. Always read and follow the label prior to application. WILBUR-ELLIS, EFFICAX, OIL-BLEND, and EVERY TANK EVERY TIME are registered trademarks, and WILBUR-ELLIS is a trademark of Wilbur-Ellis Company LLC, © 2016.

Flumioxazin Optimized with EFFICAX



% Control Weed Species at 5 Evaluation Dates



With EFFICAX - extended control is achieved over herbicide treatment alone

Weed species not identified

Means followed by same letter do not significantly differ. If graph contains multiple bars/lines, means from different evaluations (different colored vertical bars or different points on a line) do not correspond. (Non-Nutrition/Biological: P=.05, Nutrition/Biological: P=.10, LSD). If no letters are present, there is no significant difference.

CSU, 2019

PDF195030CO05

Turf and Beds

EARLY SEASON WEED CONTROL

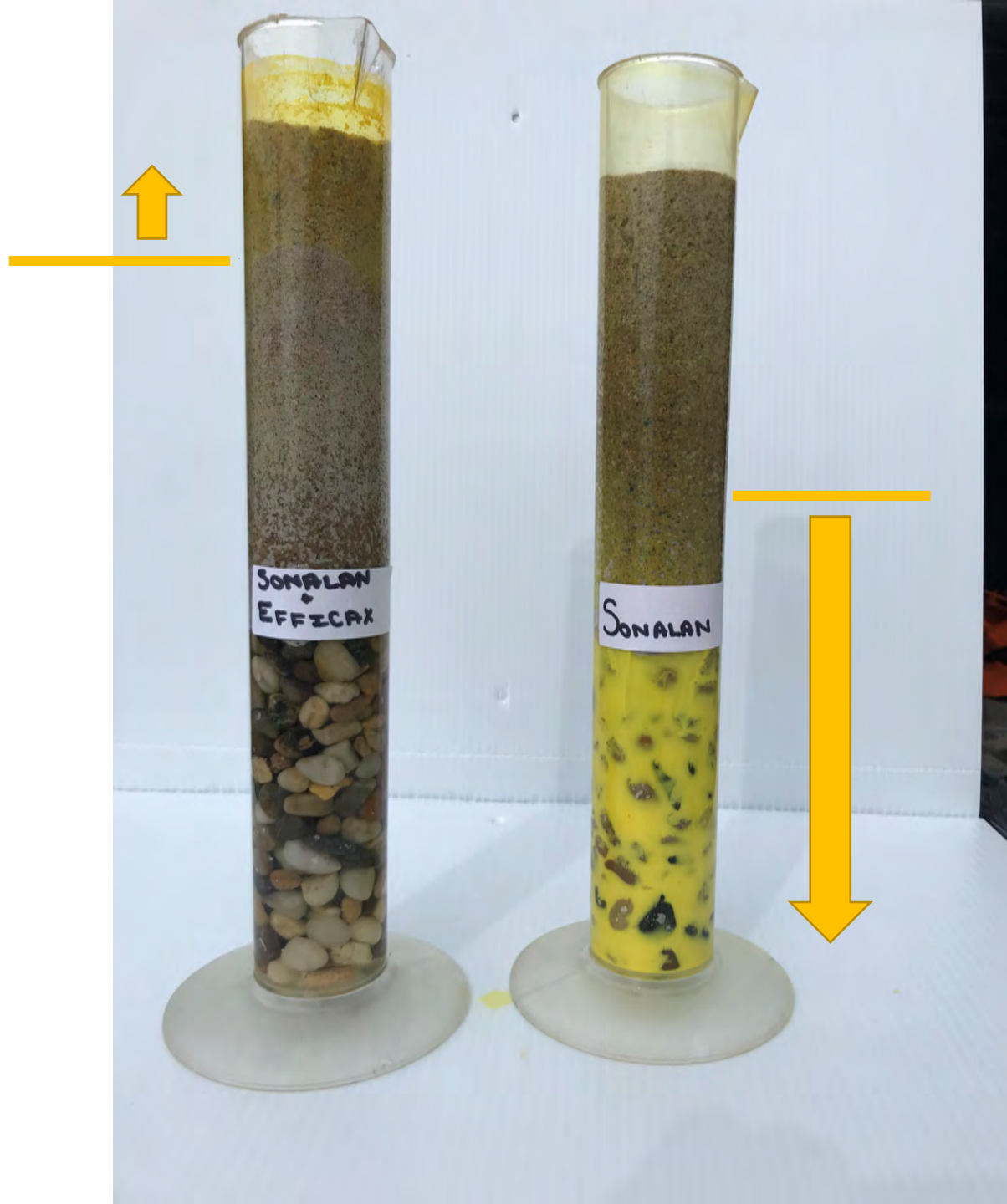
EFFICAX® OPTIMIZES THE PERFORMANCE OF SOIL-APPLIED HERBICIDES

- Increase coverage, absorption and adhesion of spray material deposits
- Optimize the residual activity of most soil-applied herbicides
- Excellent tank mix compatibility

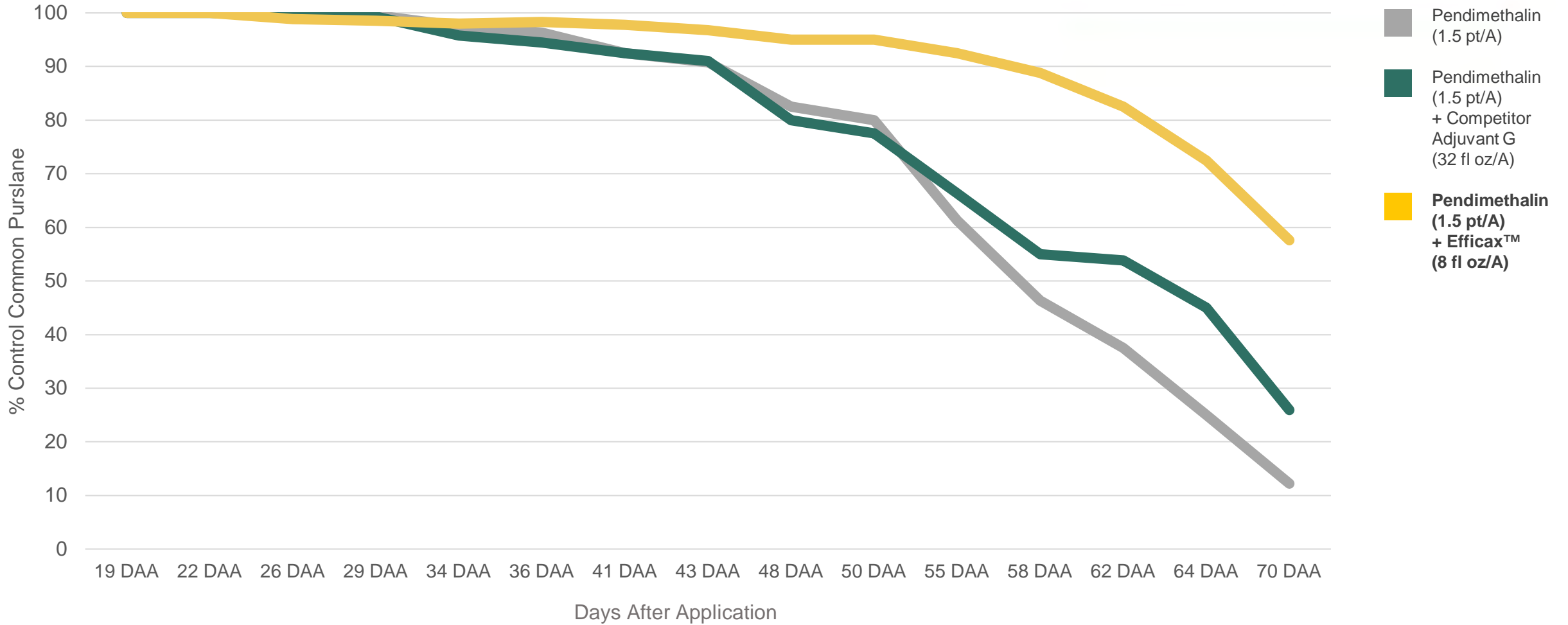
EFFICAX® utilizes proprietary technology and is designed for customers who want to optimize residual activity from their pre-plant/preemergent chemistry. EFFICAX helps to increase spray deposits of the spray material, allowing for better coverage and adhesion to soil particles, resulting in enhanced control of early season weed pressures. EFFICAX is labeled for use in agriculture, forestry, golf course, industrial, non-cropland, roadside, turf and ornamental.

Residual herbicide is optimized with the addition of 8 oz/ac of EFFICAX





Residual Herbicide Study



Use Rate

- 4-16 fl/oz per AC
- Forestry rate is 8 oz per acre

- Primary Focus uses
 - VM pre-emergent
 - Turf pre-emergent
 - Sod Farm planting
 - Bed pre-emergent
 - Forestry
 - Nursery
 - Range and Pasture



CHEMICAL SITE PREP COSTS – WHAT'S CHANGED?

2000 Site Prep Mix:

2 qts Roundup Original @
\$36.35/gl.
12 oz Arsenal AC @ \$469.33/gl.
3 oz Oust @ \$10.90/oz
1 oz Escort @ \$18.40/oz
32 oz MSO @ \$13.90/gl.

Total Material = \$116.76/ac.

2022 Site Prep Mix:

1.5 qts Gly 5.4 @ 40.00 gl.
12 oz Imazapyr 4SL @ \$117/gl.
1 oz MSM 60 @ \$2.50/oz
3 oz SFM 75 @ \$1.75/oz.
32 oz MSO @ \$17.20/gl.

Total Material = \$38.15/ac.

A helicopter with a long spray boom is flying over a vast forested mountain range. The helicopter is in the upper right quadrant of the image. The background shows snow-capped mountains under a blue sky with light clouds. The foreground is a dense forest of evergreen trees, with some cleared areas visible in the lower right.

Use July Thru Sept.

Site Prep. Mix

-
- Glyphosate 5.4 48 oz.
 - Rotary 24 oz.
 - Escort XP 2 dry oz.
 - Crosshair 4 oz.
 - Syl-Tac 6.4 oz.
 - \$37 per acre

Site Prep. Mix With Glyphosate

Use July Thru Sept.

- Glyphosate 5.4 48 oz.
- Rotary SP 24 oz.
- Bronc Max 6.4 oz
- Crosshair 4 oz.
- Syl-Tac 6.4 oz.
- May add Escort for some brush species
- Oust for heavy grass?
- Transline for Thistles?
- Esplanade F long term soil residual control?
- Opensight?



Glyphosate Products

- **Aqua Neat, Glyphosate 5.4, Accord XRT II, Roundup Pro Concentrate**
- Glyphosate is broad spectrum systemic (Roundup)
- No soil activity
- Site prep. & release
- Mix with most herbicides to target grass*, forbs, and brush
- Conifer Release – safest w/ directed spray or dormant spray
- Supply issues currently affecting cost and availability
- Lawsuits and public perception may doom this products future use

Use Spring Though Fall



Glyphosate

- We are starting out the season with plenty of:
- Aquaneat
- Accord XRT II
- Roundup Pro Concentrate

Imazapyr Products

- Arsenal AC; Polaris AC;
Polaris SP; Rotary SP, Imazapyr 4SL

Rotary is the Best choice for site prep as it has carriers that help with brush penetration

Imazapyr 4SL is best for release treatments

- Brush, forbs, and grass* control; broad spectrum systemic
- Great mix partner with glyphosate
- Short term soil activity
- Site prep & release, directed spray, or trunk treatments

Use Summer Through
Fall



Sulfometuron methyl

- Oust XP
- Great grass & fair weed killer
- Safe over top dormant conifers
- Post & pre-emergent
- Most uptake via roots
- Active availability dependent on rate applied, soil type, soil organic matter, soil pH, soil temp., and soil moisture
- Tends to release annuals such as Marestalk and Prickly lettuce
- Esplanade F would be a great tank mix partner



Metsulfuron methyl

- **Escort XP**
- Foliar and soil active; post and pre-emergent
- Kills brush, weeds, forbs, conifers
- Safe for most grasses
- Unsafe over top conifers
- Site prep only or directed spray
- Great on Mullein, brush and many noxious weeds



Glyphosate 5.4
, Rotary and
Escort!



Hexazinone Products

- Velpar L & DF
- Safe for PP; DF; LP; GF; ES
Kills WL; WP
- Site prep or release applications Spring & Fall
- Soil & foliar active systemic
- Post & pre-emergent for;
Grass, SL Ceanothus, Bear
grass, Aspen, Willow, Hawthorn



Velpar L

- Manufactured by NovaSource
- Now has a combined ag and forestry label.
- Ag label includes crops such as Alfalfa and Blueberry.
- Replaces Velpar L (VU) and Velpar L (CU)



Velpar[®]
DF

Upcoming label changes

- Mixers and loaders supporting applications to Forestry, Christmas Trees, Pasture/Rangeland, Berbudagrass/Bahiagrass, and Uncultivated areas including Rights-of- Way must wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any N, R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any N, R or P filter; OR a NIOSH-approved powered air purifying respirator with HE filters.
- Respirator fit testing will be required (for non-crop uses; forestry and range and pasture fall under the worker protection standards which have respirator fitting requirements)
- Closed mixing and loading systems will be required for mixers and loaders when applying aurally to uncultivated areas. This will not pertain to applications in forestry.



Velpar[®]
DF

Upcoming label changes

- An upper limit will be added for maximum allowed lbs of hexazinone active per gallon when applied by mechanically powered handguns (1.12 lbs of a.i. per gallon). Does not apply to backpack sprayer applications.
- All rates required conversion to lb a.i./acre
- Add maximum use rate, single maximum use rate, maximum applications per year and retreatment intervals in more than one application.
- Additional changes not listed here— always read and follow label directions

Atrazine

- Soil & foliar active, post, pre-emergent
- Good for grass, weeds, forbs, seed pre-emergent
- Can be sprayed on freshly burned or logged areas
- Site prep or release over top dormant conifers
- Federally restricted use, all states
- Looks like this products forestry uses will be taken off the label



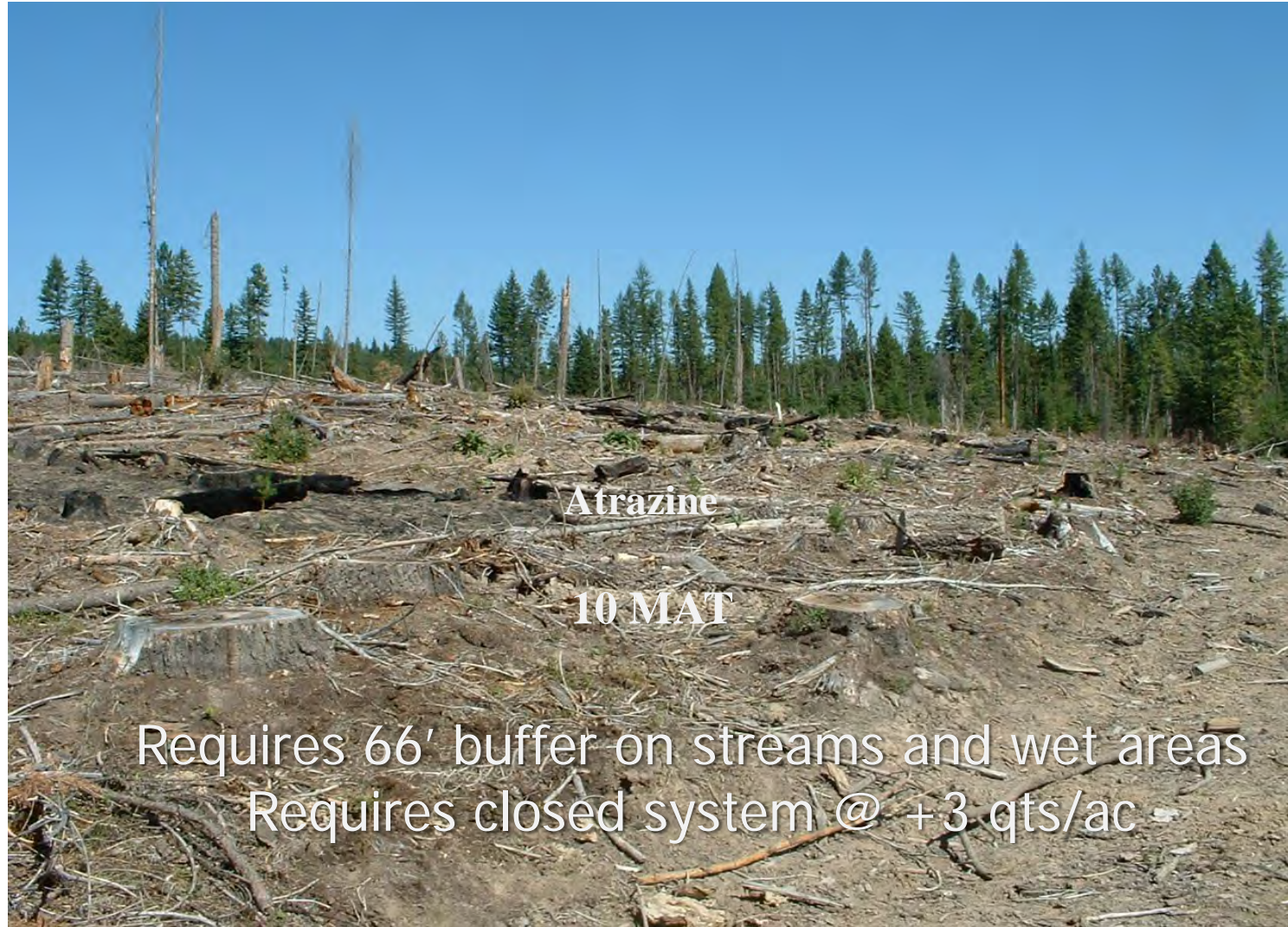
Atrazine Test Strip



Same site



Waving Wand Application



Atrazine

10 MAT

Requires 66' buffer on streams and wet areas

Requires closed system @ +3 qts/ac

Late Fall Site Prep. Mix

- Atrazine 128 oz.

- Efficax 8 oz.

- Or

- Oust XP 1.5 dry oz.

- Esplanade F 5 oz

- Efficax 8 oz





Science For A Better Life



Kent Pittard – Area Sales Manager

Bayer Vegetation Management

- <http://www.bayervm.com> Kent.Pittard@Bayer.com

Bayer products for coniter production



Velpar[®]
DF



Oust[®]
EXTRA



EsplAnade[®]
F



Escort[®]
XP



Oust[®]
XP



EsplAnade[®]
F

- Pricing unchanged for 2022
- FIFRA 2(ee) Recommendation - For use on conifer production areas where Christmas trees are grown



Science For A Better Life

Introducing Esplanade F A Bayer Innovation for Forestry Vegetation Management

David Spak, Ph.D.

Product Development Manager, IVM Herbicides

Weed Shifts?

- Prickly lettuce
- Maretail
- Seen 1 to 2 years after chemical site prep
- Seems to be worse where we used SU's?



Spring release at early
post bud break
Transline and Esplanade F



Good spring annual preemergent control



Esplanade F
Good over the top conifer tolerance

Spot Application Over Seedlings

- Velpar L 128 oz.
- Efficax 8 oz
- Hi-Light Dye 2 oz.
- Dormant PP, LP, DF, ES

- Esplanade F 5 oz
- Oust XP 1.5 dry oz
- Efficax 8 oz
- All dormant conifer including Larch and White pine



Spot spray: >3-5 feet in diameter



Spot treatments: Meter Jet



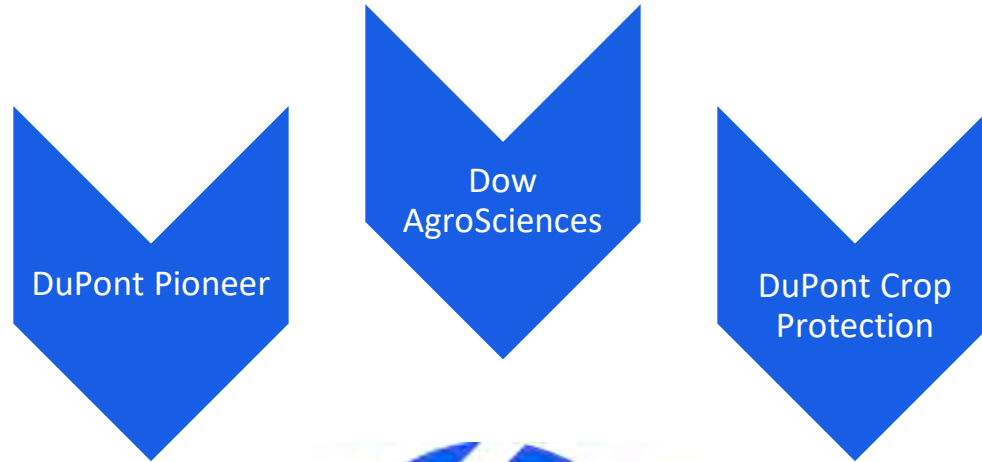
Meter-Jet gun



w/o
DISK



Bringing Industry Leaders Together

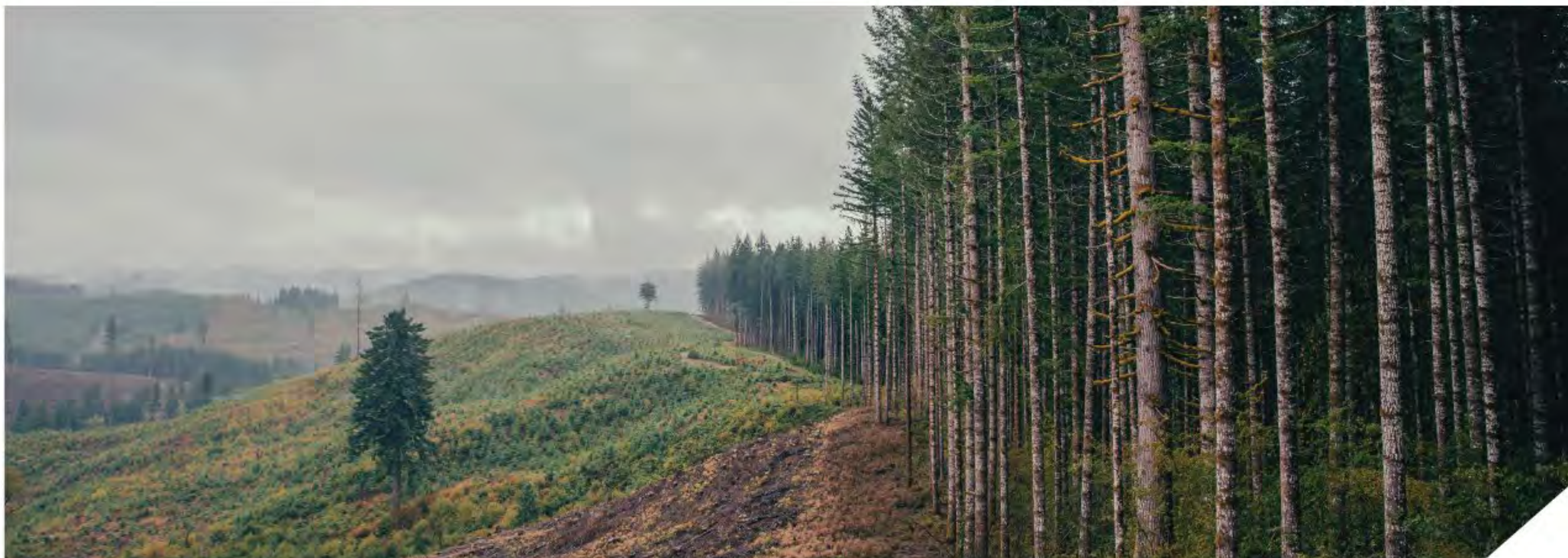


CORTEVATM
agriscience

Cleantraxx[®]

HERBICIDE

Conifer Forest and Tree Plantations Use



Visit us at
vegetationmgmt.com

Cleantraxx[®] herbicide is an SC formulation containing:

Penoxsulam – 0.083 lb/gallon, an ALS inhibitor (Group 2) herbicide with broad spectrum weed control.

Oxyfluorfen – 3.96 lb/gallon, a PPO inhibitor (Group 14) herbicide, a long time standard for broad spectrum weed control.

Cleantraxx Best Results

Cleantraxx[®]
HERBICIDE

Best results are obtained using Cleantraxx[®] herbicide at 4.5 pints/acre with a rain event within 21 days after application.

- Optimum results using 10 gallons per acre and to areas after burns with little litter and vegetation on the soil.
- Keep product agitated, keep from freezing, and avoid use in temperatures close to freezing.
- **MIX AND SPRAY SAME DAY!**

Benefits

- ✓ Broad Spectrum Weed Control – Over 50 broadleaf and grass species, including **False Dandelion, Woodland Groundsel, and Ceonothus. (SLN)**
- ✓ Burndown and Residual Control – Up to 6 months after the application.

Benefits

- ✓ Conifer Safety – Excellent conifer safety when applied both pre-bud break to early post-bud break.
- ✓ **Douglas-Fir, Ponderosa Pine, Redwoods, and plus hexazinone intolerant species such as Western Larch, Sugar Pine, Incense Cedar and White Fir.**
- ✓ New trials show good tolerance for other species, as well.

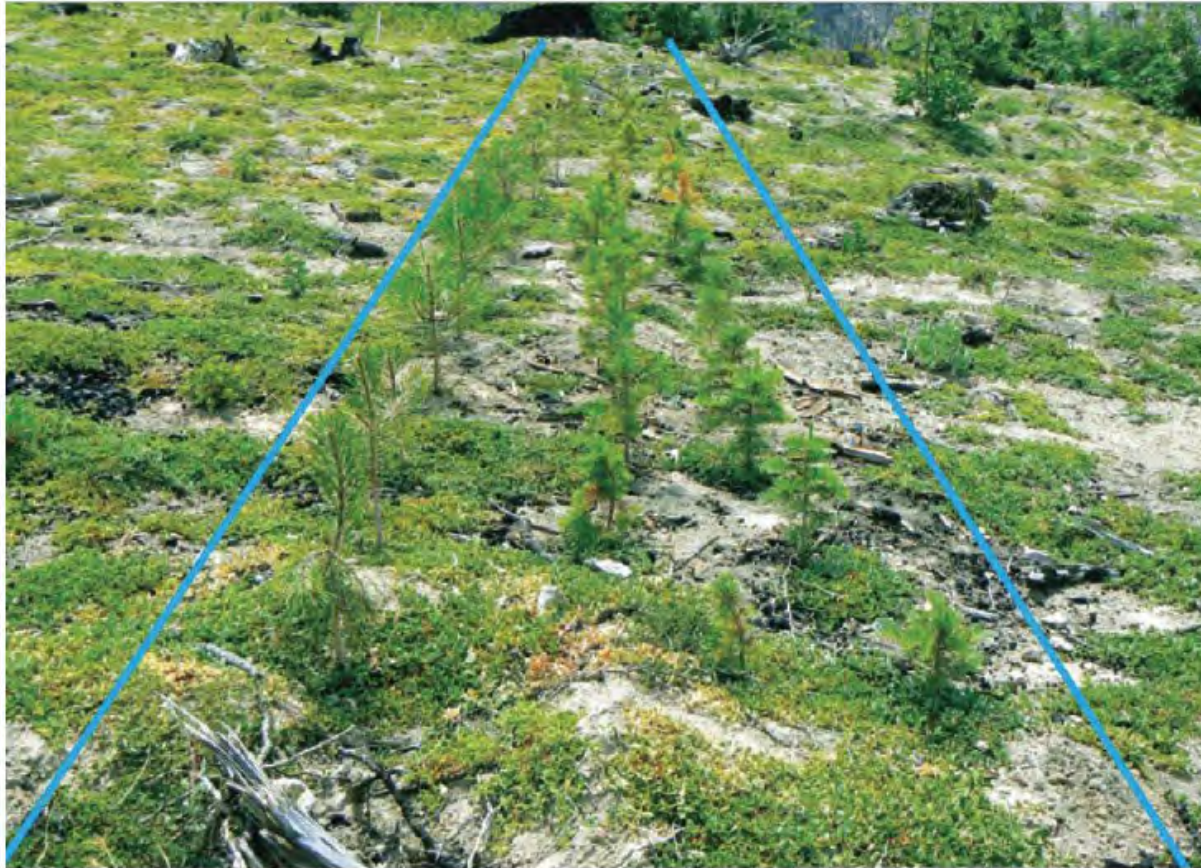
Use Rates

- Use Cleantraxx[®] herbicide at 3 to 4.5 pints/acre in the fall or early spring for pre or early post weed control.
- Typical use rate is 4.5 pints/acre (max annual).
- For effective early post-emergence weed control it is required that a surfactant be added such as MSO or COC at 1 qt/A or NIS at 0.25% v/v .

Sec 24c SLN

- Labeled for use in CA, OR, & WA forestry as a Special Local Needs (SLN) label.
 - WA renewal Pending
- We are lobbying for an Idaho SLN label

*Squaw Carpet control with Cleantraxx[®] at 3 pints/acre applied pre-emergence in spring
(Photo taken approximately 1-YR after treatment)*



Transline[®]

HERBICIDE

The Advantage of Transline[®] Herbicide



Visit us at
vegetationmgmt.com

Transline[®] herbicide is an SC formulation containing:

Clopyralid – 3 lb/gallon, an Auxin (Group 4) herbicide with broad spectrum weed control.

Control & Selectivity

Transline[®] herbicide controls broadleaf weeds and certain woody plants with excellent selectivity, allowing for use **over the top of many conifers and hardwood species.**

Residual

Transline[®] provides excellent residual control of **kudzu**, and many tough, Western invasive weeds, like **knapweeds** and **thistles** in conifer and hardwood forest settings (including Christmas Trees).

Transline Best Results

Transline[®]
HERBICIDE

Best results are obtained using Transline[®] herbicide at 12-20 oz/A.

- Apply when weeds are small and actively growing.
 - Thistles: Apply from rosette to before flower
 - Canada Thistle: Apply during fall regrowth or during bolting to early bud stage
 - Spotted Knapweed: Apply at rosette to mid-bolting or fall regrowth.
 - Russian Knapweed: Apply from bud to mid-flower or on dormant plants in the fall.
- Optimum results may be obtained using 5+ gallons per acre and applications to areas after burns with little litter and vegetation on the soil.

Benefits

- ✓ Conifer Safety – Excellent conifer safety when applied anytime during the season.
 - Some needle/leaf curling may occur if applied during active tree growth.
 - This effect is transient and trees should recover by the end of the same growing season or early the following growing season.

Benefits

✓ Examples of Tolerant Tree Species

Alder	Green Ash	Russian Olive
Balsam Fir	Hackberry	Sawtooth Oak
Black Walnut	Hickory	Scotch Pine
Blue Spruce	Hybrid Aspen	Slash Pine
Bur Oak	Hybrid Poplar	Shortleaf Pine
Cherry	Incense Cedar	Sugar Maple
Cherry Bark Oak	Loblolly Pine	Sumac
Choke Cherry	Lodgepole Pine	Sycamore
Cottonwood	Longleaf Pine	Western Red Cedar
Crabapple	Noble Fir	Western Hemlock
Douglas-Fir	Norway Spruce	White Ash
Eastern Red Cedar	Pacific Silver Fir	White Pine
European Larch	Ponderosa Pine	White Spruce
Fraser Fir	Red Oak	White Oak
Grand Fir	Red Pine	

Transline[®] Conifer Release 16 oz/A Over Growing Conifers



Opensight®

- Water Dispersible Granule (WDG)
 - Aminopyralid + Metsulfuron Methyl
 - Auxin (Group 4) + ALS (Group 2)
 - Pre and Post-emergent activity
- Control over 170 broadleaf weeds and woody plants.
- Use Rate: 2 – 3.3 oz/A
- **The broadest spectrum forestry weed and brush herbicide available in one container.**

Opensight[®]

- 24c SLN – For control of Scotch Broom, Thistles, Hawkweed and other weeds in Forest Plantations.
- ID, WA, OR
- **Forest Site Prep** and Directed / Spot Spray
 - Avoid spray contact with foliage and root zone.
 - Conifers planted sooner than 4 months (East of Cascades) or 2 months (West of Cascades) after treatment may be injured.

Opensight™ Packaging

1.25 lb. and 10 lb. containers



2 x 10 lb containers/case
20 oz measuring device



6 x 1.25 lb containers/case

Species Controlled

- Over 160 weeds listed on label
- General weeds
 - Horsenettle, bedstraw, ragweed's, horseweed (marestail), goldenrods, spiny amaranth, dandelion, wild carrot, ironweed, annual broomweed, biennial thistles
- Noxious weeds
 - Bull thistle, Canada thistle, Italian thistle, Scotch thistle, buttercup, sulfur cinquefoil, hawkweeds, knapweeds, common tansy, tansy ragwort, poison hemlock, pigweed, hoary cress (whitetop), houndstongue, common mullein, *Sericea lespedeza*
- Brush
 - Buckbrush, locust (black and honey), blackberry, gorse, hawthorn, poplar, salmonberry, Scotch broom, thimbleberry, dewberry, rose spp., wisteria, tree of heaven and mimosa.



Opensight-use Efficax to help prevent movement into conifer root zone



Site prep in North Idaho

Shows skip the spring after a summer site prep spray



The background of the slide is a scenic view of a dense evergreen forest covering rolling hills and mountains. The trees are a vibrant green, and the mountains in the distance are shrouded in a light mist or haze. The sky is a pale, clear blue.

Questions?
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