

Southern Pine Site Preparation



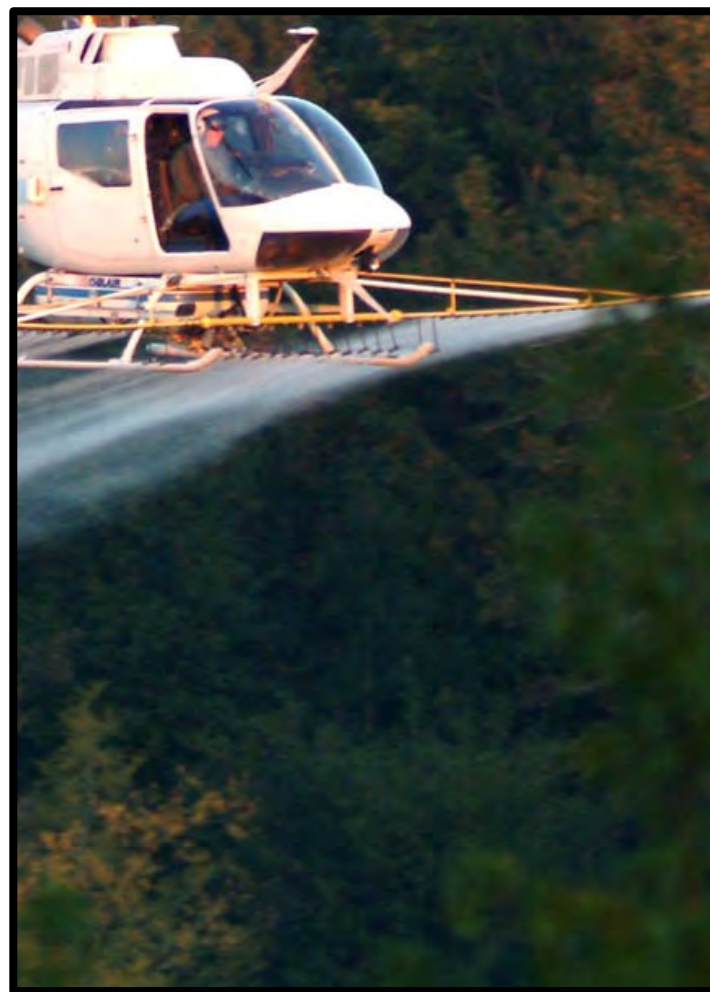
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Strategic Accounts Manager
Professional Vegetation Management
BASF Corporation

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Agenda

- **Discuss Situations**
- **Base Products**
 - Chopper GEN2
 - Arsenal AC
- **Other Products**
 - Frequency
 - Detail
 - Finale VU
- **Use Recommendations**



You Just Harvested Timber

What do you do now?



Ready To Plant?



This Is What Comes Back!



Goal of Site Preparation

- Maximize seedling survival
- Control competitive species
- Provide residual control
- Maximize tree growth



Types of Site Preparation

■ Broadcast

● Aerial



● Ground



Timing of Site Preparation Applications

- Early summer

- Target hardwoods and wildling pine

- Fall

- Target hardwoods, wildling pine and extended herbaceous weed control

Chopper® GEN2™ Review

- Active ingredient: imazapyr
- Chemical Group 2
- **Chopper GEN2** with *Transport Technology*™ improves absorption of the active ingredient
- Provides the most effective, long-term brush and broadleaf weed control on the market



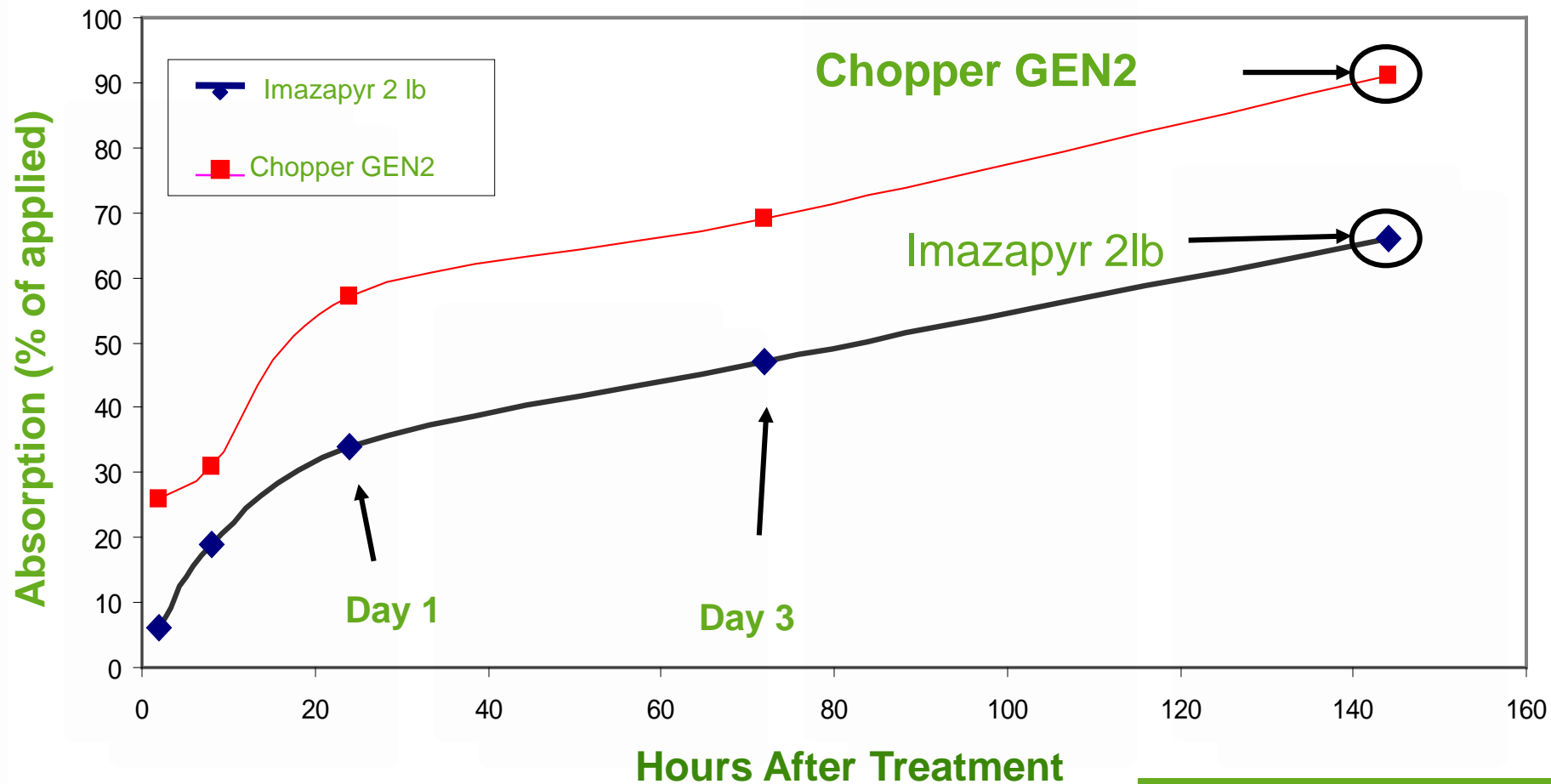
Chopper® GEN2™ Review

- Site Preparation or understory Mid-rotation release
- Early summer to fall
- Designed to mix with Oil for enhanced control
- 48 oz. Chopper GEN2 is the industry standard for site preparation



Chopper[®] GEN2[™] Review

Red Oak- Impact of Transport Technology



Chopper® GEN2™ Review

- Get more imazapyr into the plant faster
 - Better for drought conditions
 - Better for late season applications when leaves start to change
 - Better when application is not ideal
 - ▶ Works well on waxy shrubs with 1 gallon MSO/acre
- Excellent for fall site preparation applications
 - ▶ Provides residual HWC into the next year



Chopper® GEN2™ Timing and Pine Growth on Upper Coastal Plain Sites

Chopper GEN2 site prep was applied at different timings and was followed by different HWC timings: 3 year results

- Early Chopper GEN2 site preparation treatments (July) resulted in better pine growth than site preparation later in the year (October)
- There was a synergistic response between Chopper GEN2 site preparation and Arsenal AC + Oust XP HWC with pine growth far exceeding the growth of either treatment alone



48 oz. Chopper GEN2



Chopper® GEN2™ Timing and Pine Growth on Upper Coastal Plain Sites

Chopper GEN2 site prep was applied at different timings and was followed by different HWC timings: 3 year results

- Optimal HWC timing was not influenced by timing of Chopper GEN2 site preparation
 - ▶ On sites where planted pines and weeds developed quickly in the first year, HWC early in the first pine year resulted in the best pine response
 - ▶ On sites with slow pine and weed development response, HWC in June of the first pine year resulted in the best pine response
- A second year HWC increased pine growth by up to 23%
- Modern silvicultural techniques resulted in pine growth that equaled or exceeded the growth in complete vegetation management studies where pines were kept weed free for up to 5 years



Arsenal AC Review

- Active ingredient: imazapyr
- Very versatile
 - ▶ Pre-plant or Over the Top
 - ▶ Summer or Fall
- Provides the effective, long-term grass, broadleaf weed and brush control
- Aquatic Label
- 20 oz. to 24 oz. Arsenal AC is the industry standard for late summer and fall site preparation



ARSENAL[®]
herbicide
APPLICATORS CONCENTRATE

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Arsenal AC Summary

- Consistent control across labeled species
- Better control of tough species
- Lower use rates than other programs



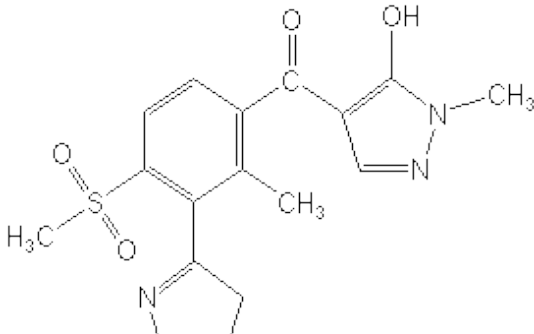
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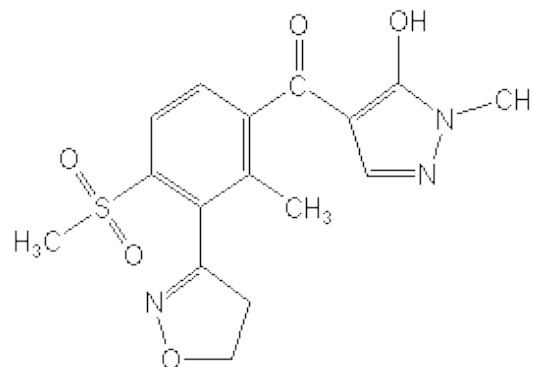
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What About Planting Timing after Site Preparation with Arsenal AC or Chopper GEN2?

- Best pine growth is early summer site preparation, followed by HWC the next spring
- Majority of site preparation is from August to November with no seedling injury
 - We have 30 years of successful history
- Some temporary height growth inhibition can occur
 - Occasionally seen following release not site preparation
 - Greatest potential on sandy soils
- No need to cut rates – Competition control provides pine growth
- We have the data!

Frequency Review

- Active ingredient: Topramezone
 - ▶ Chemical Family: benzoylpyrazole; pyrazolone
 - ▶ HPPD Inhibitor (Bleacher)
 - Pre-emergent and early postemergent control of grasses and broadleaf weeds
 - Absorbed by roots and foliage
 - Xylem and phloem mobile
 - Non-volatile
 - Caution label
 - No lateral or vertical movement
- 
- CN1C=CC(=C1C(=O)c2cc(C)c(S(=O)(=O)C)c3c2C=C4C=CCN4)O
- The chemical structure of Topramezone is a benzoylpyrazole derivative. It features a central benzene ring substituted with a methyl group, a methanesulfonyl group, and a 4-methyl-5-(4-methyl-5-hydroxy-1H-pyrazol-3-yl)-2-pyrazolyl group.



Broadleaves Controlled

- Palmer Amaranth
- Powell Amaranth
- Burcucumber
- Carpetweed
- Common Chickweed
- Common Cocklebur
- Common Lambsquarters
- Common Mallow
- Dandelion*
- Hairy Galinsoga

- **Horseweed (Marestail)**

- Jimsonweed
- Kochia
- Venice Mallow*
- Morningglory sp.*
- Mustard sp.

- Nightshade - Black, E. Black, Hairy

- **Pigweeds - Redroot, Smooth,**

Tumble and Prostrate

- Prickly Lettuce

- **Common Ragweed**

- **Giant Ragweed**

- Shepardspurse
- Prickly Sida
- Pennsylvania Smartweed
- Ladysthumb
- Sunflower - Wild and Volunteer
- Canada Thistle*
- Russian Thistle
- Velvetleaf
- Waterhemp - Common and Tall

*partial control

Grasses Controlled

- Bermudagrass
- Barnyardgrass
- Large Crabgrass
- Smooth Crabgrass
- Giant Foxtail
- Goosegrass
- Green Foxtail
- Yellow Foxtail*
- Seedling Johnsongrass*
- Shattercane*
- Sprangletop
- Rhodes grass, windmill grass
- Fall Panicum*
- Wild-Proso Millet
- Broadleaf Signalgrass*
- Woolly Cupgrass*

*partial control

Frequency Review

- AI has been approved for aquatic uses
- Excellent for high rainfall areas
- MSO @ 1% for post emerge activity
- Use Rates: Up to 16 oz. for Forestry site preparation
- Minimum 10-20 gpa
- Weed size range: 3-6 inches

Frequency Opportunities

- Longleaf Pine Site Preparation
 - ▶ Old fields
 - ▶ Bermudagrass Pastures
- Where crop trees have less tolerance to Arsenal AC or Chopper GEN2.
 - ▶ Slash pine
 - ▶ Longleaf pine

Longleaf Pine Establishment and Release



Frequency Opportunities

- Longleaf or Slash Pine Site Prep / HWC
 - ▶ Old fields
 - ▶ Bermudagrass Pastures



Frequency Site Preparation

8 oz. Frequency + 32 oz. Arsenal AC + 2 qts. Glyphosate
11MAT (June Application)



Longleaf Pine Tolerance to Frequency

8 oz. Frequency + 4 oz. Arsenal AC – HWC 1 MAT



Herbaceous Weed Control

Applied April 2018

1.5 YAT



8 oz. Frequency + 16 oz. Atrazine
Slash Pine

Tips For Success

- Add 2 oz. Detail for improved burndown of existing vegetation
 - ▶ Site prep only
- Tank-mix with Chopper GEN2 for site prep or Arsenal AC for site prep and HWC to improve grass control

Frequency Summary

- Excellent tank-mix partner for difficult to control weeds
- Use with tank-mix partners to improve grass control, nutsedge and vine control
- Up to 16 oz. per acre
- Season long control
- Tank-mix partner for resistance management

Frequency Conclusions

- Excellent tolerance over the top of southern pines
- New solution for enhanced Bermudagrass and broadleaf weed control problems
- Another option where pine tolerance is a concern

Recommendations

Longleaf or Slash Pine Site Preparation

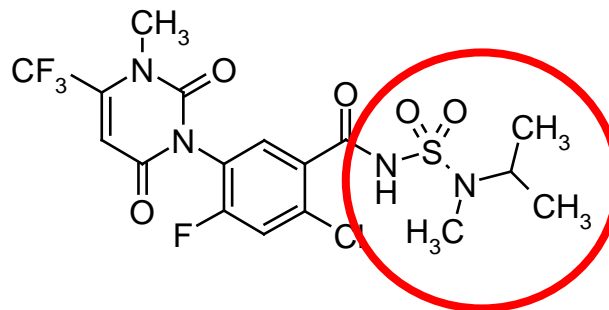
- 32 oz. Chopper GEN2 + 8 oz. Frequency + 2 oz. Detail + 1% MSO

Longleaf Pine or Slash Herbaceous Weed Control

- 4 oz. Arsenal AC + 8 oz. Frequency (No surfactant)
- 16 oz. Clethodim + 8 oz. Frequency (No surfactant)
- 16 oz. Atrazine + 8 oz. Frequency (No surfactant)

Detail Review

- Active ingredient: Saflufenacil
- Synergy patent - Improves spectrum and burn down of glyphosate
- Non volatile
- Caution label
- Limited soil residual



Detail Review

- Chemical Group 14
- Mode of Action: PPO Inhibitor
- Does not antagonize with slow acting ALS chemistry
- Developed as a pine control product
 - ▶ Controls eastern red cedar and other western conifers
- Labeled for site preparation in conifers and hardwood plantations

Detail Summary

- Excellent tank-mix partner for fast burn-down
- State of the art wildling pine control
- Low use rates
- Controls difficult species – mareetail, ragweed
- Add Detail everywhere you use glyphosate or Finale VU



Tips For Success

- 2 oz. per acre broadcast
- 1/8% - 1/4% solution in backpack
- MUST add MSO 1% for control
- Coverage is critical - 15 gpa aerial
- pH must be between 6.0 – 7.5
 - ▶ Do not add acidifying agents
- Use 1 gallon rate of glyphosate
- 15 gpa for site preparation
- Maximum 6 oz. per year



Site Preparation Results 3 WAT



2 oz. Detail + 4 qts. Accord XRT - Aerial, VA



Site Preparation Results 1 MAT



2 oz. Detail + 4 qts. Glyphosate + 20 oz. Arsenal AC + 10 oz. Garlon XRT + 3 oz. Oust XP
Ground Broadcast, SC

DETAIL™ 
POWERED BY **KIXOR**® HERBICIDE


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Site Preparation Results 2 MAT

June



August



2 oz. Detail + 4 qts. Accord XRT + 40 oz. Chopper GEN2
Aerial, VA

Site Preparation Results – 2 MAT



2 oz. Detail + 4 qts. Accord XRT + 48 oz. Chopper GEN2
Aerial, VA

DETAIL™ 
POWERED BY **KIXOR**® HERBICIDE

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Site Preparation Results 4 MAT



2 oz. Detail + 3 qts. Glyphosate + 48 oz. Chopper GEN2 + 18 oz. Garlon XRT
Aerial, SC



Site Preparation Results 6 MAT



64 oz. Chopper GEN2 + 2 oz. Detail + 1 gal. Mad Dog + 16 oz Garlon XRT 4 oz. Oust Extra
Aerial, NC November

DETAIL™
POWERED BY **KIXOR**® HERBICIDE



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Site Preparation Results 7 MAT



20 oz. Arsenal AC + 2 oz. Detail + 128 oz. Accord XRT + 4 oz. Oust Extra + 1 oz. Escort
Aerial, NC October

DETAIL™
POWERED BY **KIXOR**® HERBICIDE



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Site Preparation Results 1 YAT



2 oz. Detail + 4 qts. Accord XRT + 48 oz. Chopper GEN2
Aerial, NC

Site Preparation Results

1 YAT



2 YAT



2 oz. Detail + 4 qts. Accord XRT + 20 oz. Arsenal
Aerial, VA

Site Preparation Recommendation

■ Site Preparation

- ▶ 48 oz. Chopper GEN2 + 2 oz. Detail + 1 gal. glyphosate + MSO
 - Better results with GEN2 and loaded glyphosate, especially early
 - Use 1 gal. Finale VU as a glyphosate alternative



2 YAT

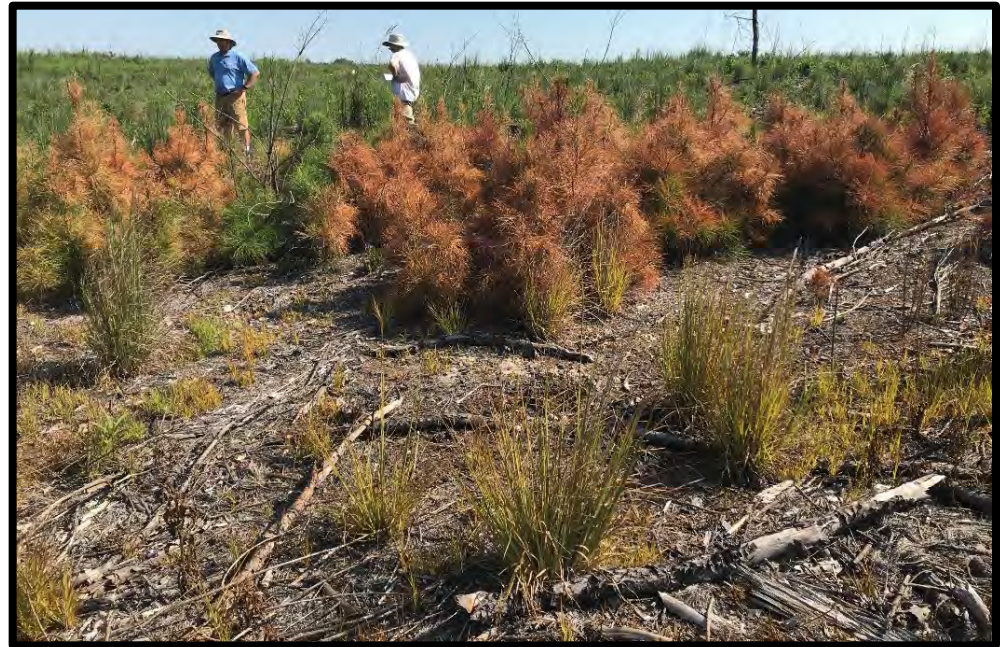
Detail Summary

- Excellent tank-mix partner for fast burn-down
- Patented enhancement of glyphosate
- Add Detail anywhere you use glyphosate or Finale VU
- Resistance management



Finale VU

- BASF now sells Finale VU
- Alternative to glyphosate for pine control
- Provides quick burndown
- Works well with other BASF site prep products

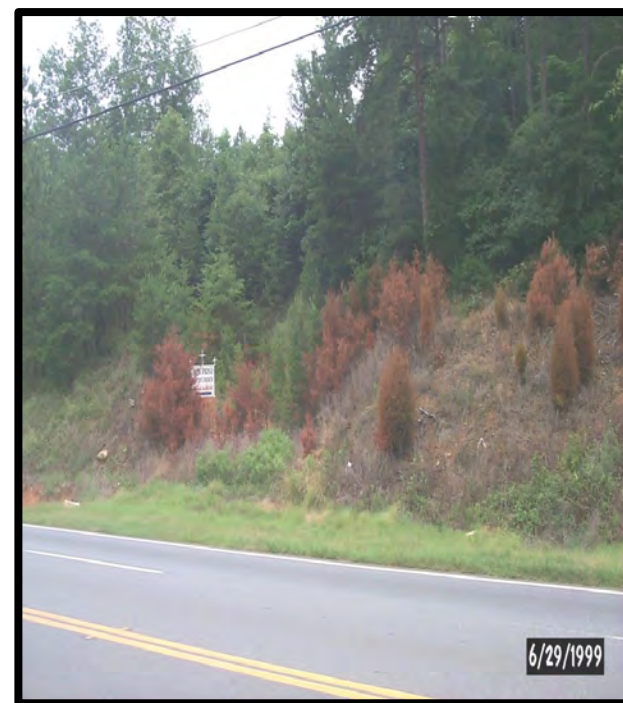


Finale VU
Herbicide

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Finale VU

- Active ingredient: Glufosinate
- Group 10 herbicide
- Signal word: Warning (temporary eye irritation)
- Broad spectrum contact herbicide
- Works on glyphosate, SU and ALS resistant weeds
- Marestalk, pigweed, crabgrass
- Use rates: 2 to 6 qts. based on weed height



Finale VU

- Rainfast in as little as 30 minutes but may take up to 4 hours depending on weed and environmental conditions
- Tank mixes with pre-emergents
- No soil residual – seed immediately
- One lb of active ingredient per gallon
- Packaging: 2 X 2.5 gallon



Finale VU Review - weeds controlled

- **Easy to control weeds:** chickweed, clover, marestail, purslane, shepherdspurse, smartweed, barnyardgrass, fall panicum, foxtail, johnsongrass, lovegrass, stinkgrass
- **Hard to control weeds:** bindweed, thistles, dandelion, dogbane, goldenrod, horsetail, lambsquarter, leafy spurge, pigweed, plantain, ragweed, velvetleaf, wild mustard, wild onion, woodsorrel, annual bluegrass, bahiagrass, Bermudagrass, carpetgrass, crabgrass, dallisgrass, fescue, Kentucky bluegrass, nutsedge, quackgrass, ryegrass, sandbur, smooth brome, torpedograss, wild oat
- **Woody species controlled:** Conifers, blackberry, greenbriar
- The addition of 8.5 to 17 pounds of AMS per 100 gallons may improve control. MSO at 1%

Finale VU versus Roundup Pro

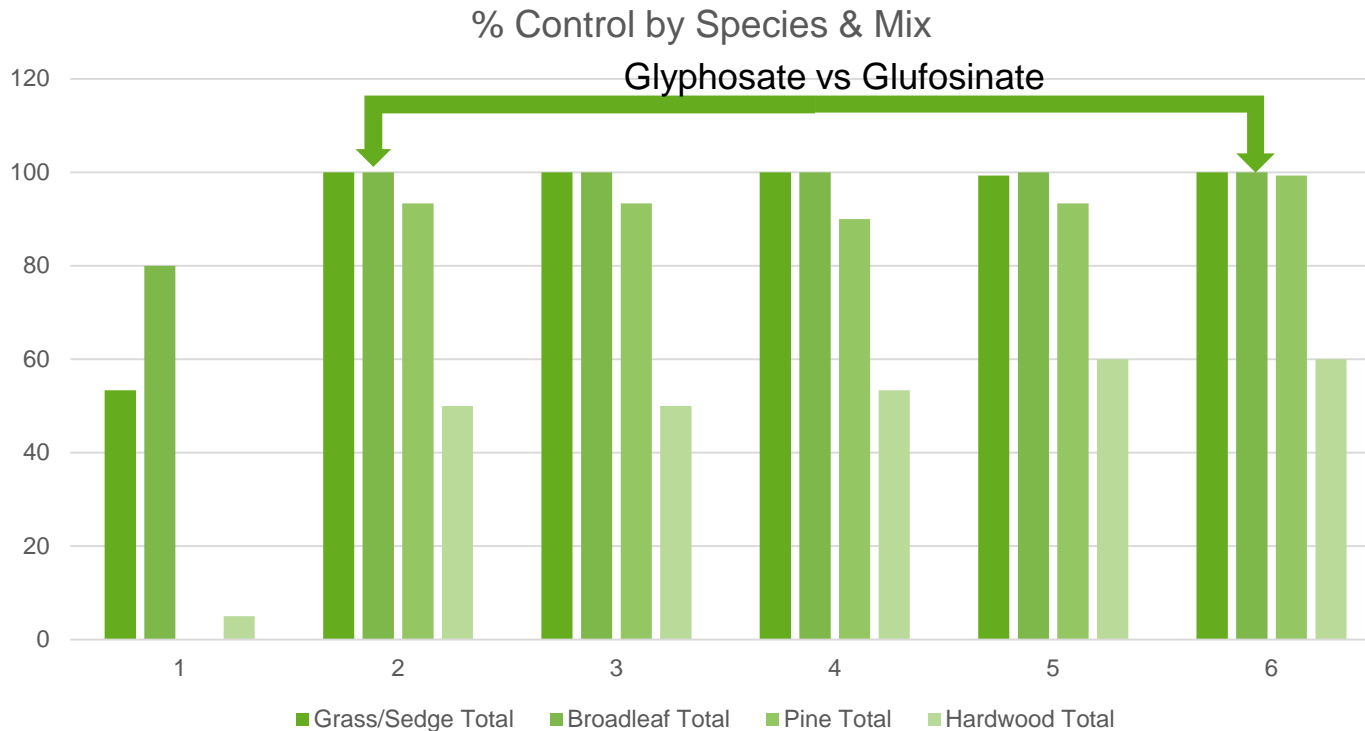
Strengths

- Controls only what you spray
- Symptoms in 1 to 4 days
- Not sensitive to water hardness
- Much lower a.i. per acre
- Strong on ALS or glyphosate resistant weeds

Weaknesses

- Minimal translocation
- No aquatic label
- Warning label – eye irritation

Andy Ezell 2019 Fall Site Prep Trial Starkville, MS – 30 DAT



1	Untreated Check
2	Arsenal AC (20oz) + Accord XRT II (4qts) + Detail (2oz) + MSO (1% v/v)
3	Arsenal AC (20oz) + Accord XRT II (2.5qts) + Finale VU (1.5qts) + Detail (2oz) + MSO (1% v/v)
4	Arsenal AC (20oz) + Accord XRT II (2qts) + Finale VU (2qts) + Detail (2oz) + MSO (1% v/v)
5	Arsenal AC (20oz) + Accord XRT II (1qt) + Finale VU (3qts) + Detail (2oz) + MSO (1% v/v)
6	Arsenal AC (20oz) + Finale VU (4qts) + Detail (2oz) + MSO (1% v/v)

Finale VU - Site Preparation Recommendations

- Substitute 4 qts. Finale VU for 4 qts. Glyphosate for pine control
- Use 48 oz. Chopper GEN2 or 24 oz. Arsenal AC for hardwood control
- Add 2 oz. Detail for residual broadleaf weed control
- Add 2 oz. Escort XP for rubus and additional hardwood control
- Always add MSO

Site Preparation Recommendations

Pine Control

- 48 oz Chopper GEN2 (or 24 oz Arsenal AC) + 4 qts Finale VU + 2 oz Detail + 2 oz Escort XP + 3 oz Oust XP + 1% MSO per acre

Waxy Shrubs

- 48 oz Chopper GEN2 + 2 oz Detail + 2 oz Escort XP + 3 oz Oust XP + 1 gallon MSO per acre

Upland Hardwoods

- 48 oz Chopper GEN2 (or 24 oz Arsenal AC) + 2 oz Detail + 2 oz Escort XP + 3 oz Oust XP + 1% MSO per acre
- Finale VU provides pine and herbaceous weed control
- Detail enhances pine and waxy shrub control and improves mareetail control
- MSO improves waxy control

Site Preparation Conclusions

- Data indicates the best pine growth occurs following an early summer application of Chopper GEN2 (or Arsenal AC) followed by a HWC treatment the next spring with Arsenal AC + Oust
- Use Chopper GEN2 + 1 gallon MSO for waxy species control
- Use Chopper GEN2 for the best early and late season hardwood control
- Frequency is a new option for site preparation and for pre and post plant herbaceous weed control
- Detail is an effective new tool for wildling pine control
- Finale VU is an alternative to glyphosate for pine control

Questions?

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**Visit our website at www.bettervm.basf.us for
additional product information!**

Thank you!





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