

Imazapyr (Stalker* or Chopper* herbicide);

Considerations for the Control of Invasive Plants

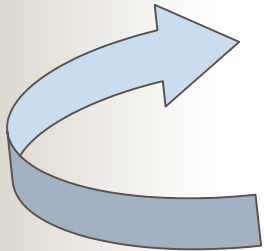




Vegetation Management Considerations

■ Purpose

- Fuels
- Access (ROW)
- Facility integrity
- Habitat restoration/creation
- Noxious and exotic weed control



■ Ecosystem

- Forest
- Grass land
- Riparian



Vegetation Management Considerations

- Legal use sites (Labeled and purpose)
 - Roadside/trail/ROW (transportation/recreation)
 - Riverbank (water conveyance/habitat/recreation)
 - Pasture (grazing/wildlife habitat)
 - Potential disturbance
- Target Species
 - Grass/ broadleaf
 - Family/genus/species
 - Annual/perennial



4-4'00



Imazapyr

At a Glance

- Stalker, Chopper
 - 2 lb ai. Imazapyr
 - Imidazolinone
 - Broadleaf and grass activity
 - Broad spectrum/use sites
 - Category III
 - Caution label



Imazapyr

Mode of Action

- Pre & Post-emergent
- Amino Acid Synthesis Inhibition
 - AHS inhibitor
 - Growth stops and growing point becomes chlorotic
 - Plants die as result of AHS inhibition
- Very systemic/phloem mobile
- Slow metabolism in plants
- Moderate soil persistence



Imazapyr

Toxicity

■ Stalker, Chopper

- rat, Oral LD₅₀ > 5000mg/kg
- rabbit, dermal LD₅₀ >2000 mg/kg
- eye irrit., rabbit, moderate
- NOEL, 24 months, 500-1500 mg/kg/d
- Not an oncogenic (E rating)
- Not a teratogen
- Not A reproductive toxin
- Not a mutagen



Imazapyr

Wildlife Toxicity

■ Stalker, Chopper

- Quail 8 day diet $LC_{50} > 5000\text{ppm}$
- Duck 8 day diet $LC_{50} > 5000\text{ppm}$
- Honey bees $LD_{50} > 100 \text{ M g/bee}$
- Earth worm 14 day $LC_{50} > 132.5\text{ppm}$
- Daphnia 48 hr- $LC_{50} > 100\text{ppm}$
- Bluegill 96 hr- $LC_{50} > 100\text{ppm}$
- Trout 96 hr- $LC_{50} = > 100\text{ppm}$
- Catfish 96 hr- $LC_{50} = > 100\text{ppm}$



Imazapyr

Environmental Fate

■ Stalker

- Soil half life ~ 25-142 days
 - Microbial Degradation
- Water half life 2-3 days
 - Light
 - Temperature
- Soil mobility
 - 12-18 inches vertically/no lateral movement
 - Binding is a factor of
 - OM and clay content (more = less movement)
 - pH(lower = less movement)
 - Moisture (less = less movement)



Imazapyr

Spectrum

- Alder
- Arundo
 - Other exotic grasses
- Castor Bean
- Eucalyptus
- fennel
- German Ivy
- Madrone
- Maple
- Manzanita
 - Other Brush
- Oaks
- Pepper (Brazilian)
- Spartina
- Tamarix (salt cedar)
- Tanoak
- Tree of Heaven (Ailanthus)
- Willow sp.

*Weak on Berries, Broom,
Mustards and Thistles*



Imazapyr; Pros for Habitat restoration

- Spectrum
 - Arundo
 - Tamarisk
 - Tree Of Heaven
 - Weak on legumes
- Characteristics
 - Phloem mobile
 - Very systemic
 - Persistent in the plant
 - Low volume capable/spot treatments
 - Little goes a long way







Imazapyr; Cons for Habitat restoration

- Spectrum
 - Grasses
 - Willows
 - Oaks
 - Weak on Thistles
- Characteristics
 - Soil active
 - Persistence
 - Undesirable selection
 - Phloem Mobile
 - Root Grafting





Imazapyr; Why Consider it for Arundo Control

■ Efficacy

- Very sensitive
- Systemic
- Slow to act
- Control roots

■ Applications compatible with restoration

- Low Volume Foliar
 - Easy to direct
- Backpack or ATV
- Spot treatments avoid soil contact

■ Growth characteristics of Arundo

- Wide leaf
- Extensive root system
- Site Dominate
 - Non-target impact minimized







Imazapyr; Arundo Control Application Basics

- Rate or Concentration
 - 3% Stalker or Chopper
 - 5% MSO
- Volume and Coverage
 - 20% coverage of the upper portions of the plant
 - Uniform distribution of the applied material
 - 8-10 gpa max
- Application tips; back pack or Sure flow pump assist
 - Nozzle; X -1 or 2, 4003
 - Low volume
 - Focused pattern
 - Apply April thru October
 - Resprouts should be 3 to 5 feet tall and a majority of the site should have sprouted



Imazapyr; Precautions for Arundo Control

- Arundo density
- Proximity of desirable species to arundo
- Presence and density of undisireable species
 - YST,
- Proximity of water
- Revegetation plans





Imazapyr; Why Consider it for Salt Cedar Control

- Efficacy
 - Sensitive
 - Systemic
 - Persistent in plant
 - Tolerant of leaf residue
- Applications compatible with control
 - Low volume foliar
 - Basal
 - Backpack or ATV
- Growth Characteristics of Salt Cedar
 - Extensive canopy
 - Extensive root system
 - Site dominate
 - Impurities in surrounding soil reduce significant of imazapyr soil activity





Imazapyr; Salt Cedar Control

Application Basics

- Rate or Concentration
 - 1% Stalker or Chopper
 - 5% MSO
- Volume and Coverage
 - 60% coverage of the entire plant
 - Uniform distribution of the applied material
 - 20-25 gpa max
- Application tips; back pack or Sure Flow pump assist
 - Nozzle; X -8 or, 6504
 - Slightly higher volume
 - Wider pattern
 - Apply leaf out through early color change
 - Resprouts should be 3 to 5 feet tall and should have true lateral branching



Imazapyr; Precautions for Salt Cedar Control

- Proximity of desirable species to Salt Cedar
- Proximity of water
- Revegetation plans
- Type of application
 - Poor cut stump treatment



Imazapyr; Why Not Consider it for Fennel Control

- Controls grass
- Weak on YST and mustards that may invade
- Label restricts foliar applications
- Soil activity may restrict plant back options.
- Better alternatives



Imazapyr;

- Make sure product fits the job
- Don't broadcast
- Minimize soil contact when not dealing with monoculture
- Species efficacy is secondary to habitat restoration goals
- Must be part of an integrated approach