



## WSU Long Beach Research and Extension Unit

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- General Progress report for Willapa Bay
- Herbicides
- Timing
- Application methods
- Surfactants
- Other variables

# Spartina Control in Willapa Bay

- ~ 5 000 acres of solid Spartina was sprayed in 2004
- ~ 6,000 acres of solid Spartina was sprayed in 2005 (>15,000 affected acres)
- ~\$2.4 Million/year
- % control ? Ranged from 50 to 100%, with a mean of 85-90%
- In 2006
  - Final aerial treatments of all remaining meadows and large clones
  - Final boom and hand spraying of all other “non-treated areas”
  - Clean up last remaining outliers in South Bay
- In 2007 to 2012
  - Follow up control of missed and poorly controlled sites
  - Seek and destroy of outliers
- 2012 ? celebrate

## 2004/2005 Willapa spray season results - Herbicide

- All agencies report great success (80 to 99%) with aerial application of Habitat 6pt/ac with 1 qt/ac Competitor.
- All agencies report good success (75 to 95%) with hand spraying with a mix of Habitat (5 pt/100 gallons) + Rodeo (2 gal/100 gallons)+ Agridex or Competitor (1 gal/100 gal).
- All agencies have a strong preference for the inclusion of glyphosate in the tank mix. This hasn't provided greater efficacy, but has been very useful to show skips (browndown) 2 weeks post-treatment.

## 2004/2005 Willapa spray season results – Application methods

- Failure with aerial and hand applications are mainly due to skips or or poor coverage (applicator problem).
- Clean-up (re-treatment) requires at least three passes per season to miss skips. Some applicators were more rigorous than others with significant less skips. Many of the applicators only treated an area once.
- Hand applications using backpacks has shown problems getting the back-side of large plants.
- For hand-applications off of air-boat, tracked amphibious machines or ATV, control is found wanting where applicators have to get out of the boat. (Some applicators try hard to avoid walking through deep mud to spray – if they can't reach it from the boat it doesn't get sprayed.)

## 2004/2005 Willapa spray season results – Application timing

- Best, most uniform, control (approaching 100% over a large area) was from aerial treatments to virgin canopy in mid to late June/early July.

- The later in the season applications were made the greater the frequencies of failures. This was largely due to do poorer quality canopy (bent/broken shoots, canopy very dirty, canopy covered by eelgrass).

- Application past late August (during seed fill) resulted in viable seed production.

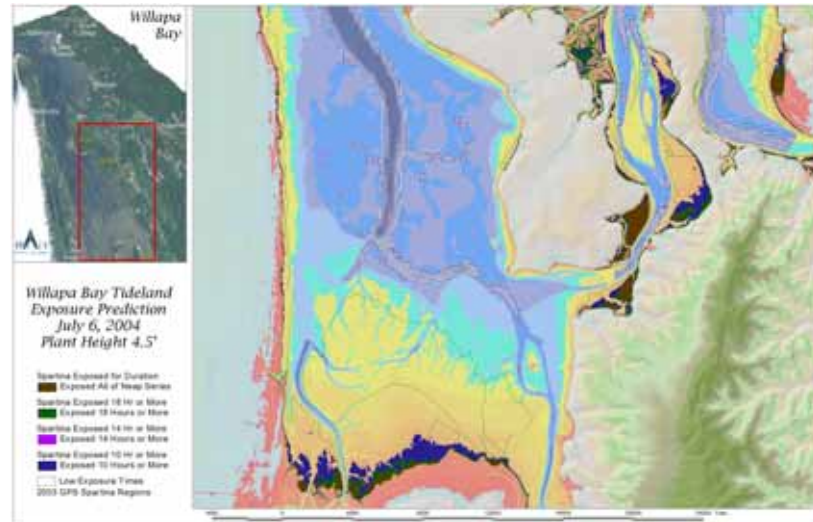
- Mixed results with May application – virgin Spartina 1-3' tall responds well (>98% control) to Habitat in May, but treatment of regrowth of previously treated Spartina has shown less than perfect efficacy.

- In areas of mixed seedling and regrowth – there is a preference to wait until later in the season to treat.

## 2004/2005 Willapa spray season results – other variables

-Efficacy was also problematic when dry-time was less than 6 hours. Research data indicated control is possible with 2-4 hours of dry time, but real-world experience indicates problems associated with 4 hours dry times.

- We have been using dry-time models based on tides, tidal elevations and plant height to schedule application windows for each area.



- Compromised efficacy with “non-virgin canopy” or previous treated/ stunted canopies. No data is available on the best way to treat these sites.

## 2004/2005 Willapa spray season results – surfactant effects

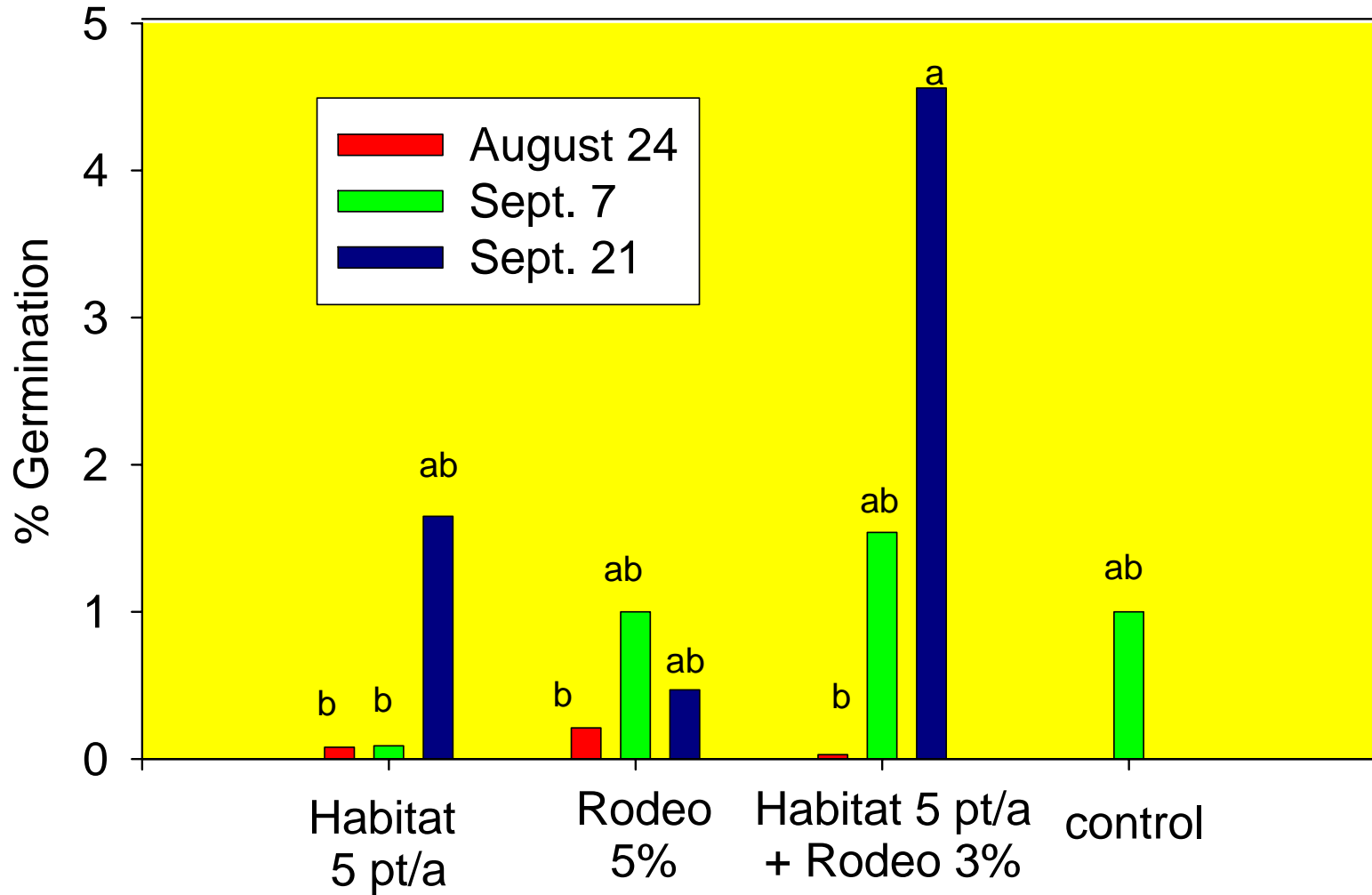
- Difference in efficacy between surfactants has been difficult to discern in the real world.
- Difference in efficacy between rates of surfactant has been difficult to discern in the real world.
- We have had application significant failures from too low a rate (1%) of surfactant (Agridex) with aerial treatments.
- Some agencies prefer Agridex for the high-volume application because of the better toxic profile. Other agencies prefer Competitor for the slight edge it has shown in research trials with efficacy under shorter dry times.
- My research data indicates superlative efficacy for Competitor, but only under compromising conditions.

## 2004/2005 Willapa spray season results – other useful piece of information

- Applicator training with live ammo is useful to avoid over-application.
- Need to adjust tank-mix concentration based on actual spray volume being applied
- Real time aerial photos has been useful for locating skips and directing re-treatment in the 1000s of miles of upper guts.



# Effect of Herbicide and application timing on the production of viable *Spartina* seed production



# Effect of Herbicide and application timing on Spartina control

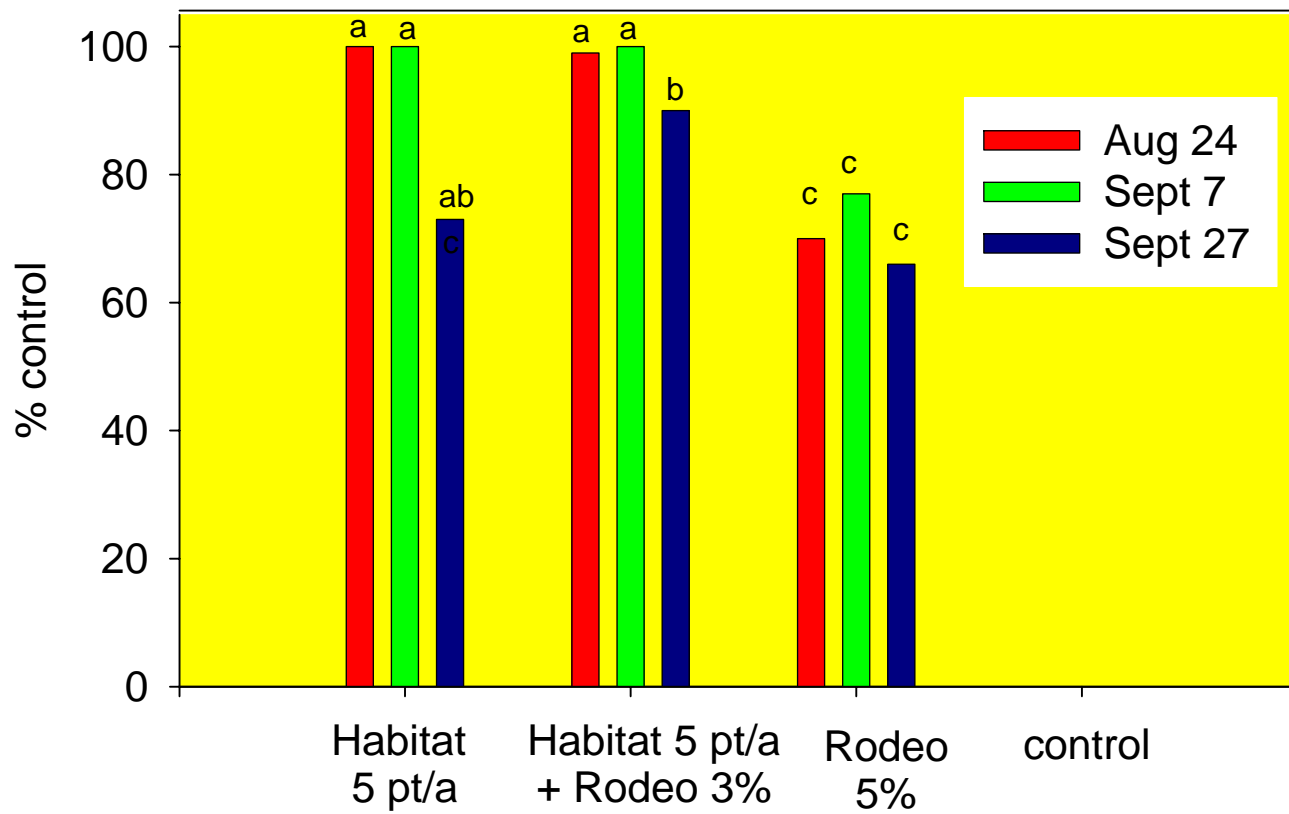


Photo Sept 2005

700 acre Spartina meadow

July 2004 -6 pt/ac Habitat 10m gpa aerial

July 2005 6pt/ac Habitat 3% Rodeo 60 gpa amphibious boom sprayer

Control 98%+






Photo October 2005

500 acre Spartina meadow

August 2004 -6 pt/ac Habitat 10m gpa aerial

July 2005 6pt/ac Habitat 3% Rodeo 60 gpa amphibious boom sprayer

Control varied 50 to 90%, lots of skips and inconsistencies

An aerial photograph showing a large, flat, brownish area, likely a mudflat or tidal flat, surrounded by water. The area is irregularly shaped and has a mottled appearance with some darker patches. To the right, there is a steep, forested hillside. The water is a deep blue color. The sky is light blue with some clouds.

Jensen Spit – mother clone  
Aerial treated June 2005, control ~ 97%



Niwakum River  
Treated with Habitat 2004 & 2005  
Control good (90% +), except for missed areas

Porter Point, 3000 solid acres

Tilled 2001

Treated with Rodeo in 2002 and 2003

Treated with Habitat in 2004 and 2005

Control inconsistent ~ 85%, a lot of clean up required

