PARROT FEATHER MILFOIL

Kim Patten
WSU LONG BEACH
pattenk@wsu.edu
Acknowledgments

Washington State Commission for Pesticide Registration
Washington State Department of Ecology
Parrotfeather Milfoil
A problematic species in many western drainage ditches and water bodies.
Parrotfeather Milfoil
Often a second story species in an invasive aquatic weed complex
Primrose/ Parrotfeather / Eurasian milfoil or Fanwort.
Parrotfeather fun facts

- Native to South America
- Introduced ~1850 as an aquarium plant and pond ornamental
- Found in Ponds, lakes, rivers, streams, canals and ditches
- Fairly well established in most of the slow moving drainage systems in SW coastal WA (Longview to Aberdeen)
- Spread to new sites stem fragments
  - floating
  - clinging to feet or feathers of water fowl
  - boating
  - mechanical harvesting
  - dumping of aquarium contents
  - no seeds
Parrotfeather fun facts

- Prefers shallow slow mowing water (depth 0.1 to 8’)
- Stems may grow 15’ long
- Roots fibrous with creeping rhizomes
- Prefers high light conditions
- Tops may be killed by hard frost, but roots over-winter sub zero weather
- Parrotfeather has some very unique bio-filtration capacity
- Tough weed to kill; here to stay
Control options

- Mechanical
- Biological
- Chemical
Control options

• Mechanical
  – Raking of top growth
    • Temporary
    • Requires annual or bi-annual
    • Massive amounts of canopy to haul and dump
  – Dredging of sediment
    • Temporary
    • Annual or every other year
    • Requires equipment access
    • Massive amounts of canopy to haul and dump
  – Concerns about sediment disturbance?
Control options

• Biological
  – A common herbivore feeds on parrotfeather, but!
Control options

Chemical

• Constraints
  – NDPES and aquatic endorsement
  – Registered herbicides
  – Herbicide efficacy
  – Herbicide restriction re: irrigation water
<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Post-treatment</th>
<th>Efficacy</th>
<th>Risk to cranberries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovate</td>
<td>120 days</td>
<td>OK, requires multiple treatments per year (Injection or broadcast)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Reward</td>
<td>2 weeks</td>
<td>Poor to OK, won’t work with dirty water, knock down only (injection)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Rodeo</td>
<td>1 day</td>
<td>OK, but requires multiple treatments per year for 3 years (Broadcast)</td>
<td>None</td>
</tr>
<tr>
<td>2,4-D amine</td>
<td>3 weeks</td>
<td>Good as high rates of injection or broadcast (injection or broadcast)</td>
<td>Depends on timing</td>
</tr>
<tr>
<td>Habitat</td>
<td>120 days</td>
<td>Good, requires 2 treatments per year or several years of one treatment (Broadcast)</td>
<td>None</td>
</tr>
<tr>
<td>Clearcast</td>
<td>None (&lt;30 ppb)</td>
<td>Fair to good, requires 2 treatments per year or several years of one treatment (Broadcast or injection)</td>
<td>None, but product is limited to Federal EUP</td>
</tr>
</tbody>
</table>
## Herbicide vs. cranberry irrigation

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Comments on risk to ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovate</td>
<td>trees and broadleaf plants in ditch (willows etc) could be hurt with drift or non target application</td>
</tr>
<tr>
<td>Reward</td>
<td>none</td>
</tr>
<tr>
<td>Rodeo</td>
<td>trees and plants in ditch (willows etc) could be hurt with drift or non target application.</td>
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<td>Habitat</td>
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<tr>
<td>Clearcast</td>
<td>none</td>
</tr>
</tbody>
</table>
Parrotfeather - easy to achieve burn down, but hard to achieve permanent control with one application
You can knock it back, but killing it for good is more difficult.
% control
## Parrotfeather Milfoil 2004

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovate 2 qt/a on 6/30</td>
<td>77</td>
</tr>
<tr>
<td>Habitat 4 pt/a 6/30 &amp; 7/13</td>
<td>67</td>
</tr>
<tr>
<td>Habitat 6 pt/a on 6/30</td>
<td>88</td>
</tr>
</tbody>
</table>

100 gpa, 1% Competitor

JBH m1
## Parrotfeather Milfoil 2004/2005

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% re-sprout coverage</th>
<th>% control 18 mat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat 6 pt/a on 9/3/04 &amp; 3 pt/a on 6/15/05 &amp; 8/29/05</td>
<td>4.5 b</td>
<td>98 a</td>
</tr>
<tr>
<td>Renovate 2 qt/a on 9/3/04 &amp; 10/20/04; 1qt/a on 6/23 &amp; 8/29</td>
<td>78.3 a</td>
<td>83 b</td>
</tr>
</tbody>
</table>

Applied 100 gpa with 1% Agridex

Seaview pfm 8 2004
Two years of treatment
Habitat vs. Renovate

March 2006

August 2004

June 2005

October 2005
## Parrotfeather Milfoil 2005

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% control (8 MAT)</th>
<th>% control (11 MAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat 3 pt/a</td>
<td>96</td>
<td>99</td>
</tr>
<tr>
<td>Habitat 6 pt/a + Rodeo 5%</td>
<td>99</td>
<td>98</td>
</tr>
<tr>
<td>Rodeo 5 %</td>
<td>87</td>
<td>83</td>
</tr>
<tr>
<td>2,4-D amine 4 qt/a</td>
<td>89</td>
<td>88</td>
</tr>
<tr>
<td>Renovate 2 qt/ac</td>
<td>92</td>
<td>95</td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Applied Sept 05, June 06 and Oct 06
2”-4” canopy in 4’-5’ water
~ 0.06

12”-18” canopy in 2-3’ water
~0.4

4”-6” canopy in 5’ water
~0.09

2” canopy in 4’ water
~0.04

Parrotfeather had significant predation by *Galerucella nymphaeae* prior to treatment.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>~ Ratio above to below water canopy</th>
<th>% resprout 50 to 66 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovate 4 pt/ac 9/3 &amp; 10/20</td>
<td>0.1</td>
<td>78</td>
</tr>
<tr>
<td>Renovate 2 qt/ac 8/12</td>
<td>0.06</td>
<td>57</td>
</tr>
<tr>
<td>Renovate 2 qt/ac 7/7</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Chemical control of Parrotfeather

• Most herbicide do a fairly decent job of providing initial control.
• Some regrowth will occur with all treatments.
• Lasting control only occurs if plots are retreated within the same year and in subsequent years.
• Control choice(s) will depend the water uses restrictions for irrigation
Best options for Grayland Drainage Ditch

• Need to figure out who can/will spray and get permits
• Assess / map the extent of infestation in north and south drainage systems.
• Compare infestation with irrigation uses by cranberry grower.
• Waters that will not be used for irrigation treated with Habitat mid summer during low water with a fall follow-up treatment.
• Waters used for irrigation should be treatment with Rodeo mid-summer with two follow-up treatment.
• In 2008/2009 retreat all areas twice
Another option for Grayland Drainage Ditch

- Clearcast injection of entire north flowing drainage ditch as large-scale experiment.
- Pending BASF approval.
- May or may not work.