Don’t Be a Vector: Prevent Movement of Invasive Plant Propagules on You and Your Equipment

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Are We “Missing the Boat” on Preventing the Spread of Invasive Plants in Rangelands

Invasive Plant Science and Management 2011 4:166–171

- “Vague suggestions”
- “Limited information”
- “Second priority”
- “Un-validated management options”
- “Prevention is largely underutilized”
- “Lack of specific prevention strategies”
  - “General lack of research”
- “Reactive more than proactive approach”

“…urgent need to place emphasis on integrating effective preventive strategies into invasive plant management.”
The Problem

Documenting the number of acreage of invasive plants treated is easily measured, ‘makes great reports,’ and less abstract than some “undetermined” decrease in the risk of invasion with prevention efforts.

*Paraphrased from “Davies and Johnson, 2011”*
So what are propagules?

Plants parts that give rise to new plants:

1) Asexual – rhizome fragments, node tissue, leafs, buds, tubers, corms, and stems

2) Sexual – seeds and spores
How are plant propagules spread:

Naturally:
- Wind
- Water
- Animals

Un-naturally?:
- “Humans”
Some Examples of propagules:

- Tubers
- Leaves
- Node tissue
- Corms
- Seeds
- Bud/apical tips
- Spores
- Rhizome/root fragment
Common hitchhikers

- Sandbur
- Caesarweed
- Beggarweed
- Spanish needles
Some examples of highly invasive plants spread unintentionally or accidentally from movement of propagules
Hydrilla

Florida: First documented in 1960

By the early 1970’s, it had spread into all the drainage basins in the state
Tubers

Apical tips / fragments

Hydrilla tubers
Photo by Alison Fox
Other Examples - Invasive Climbing Ferns

Japanese climbing fern  
*Lygodium japonicum*

- Introduced around 1900
- Multiple sites in SE United States

Old World Climbing fern  
*Lygodium microphyllum*

- Introduced around 1958?
- Two herbarium records from Florida

Both species spread by small microscopic spores
Japanese climbing fern

Pine plantations

Movement in pine straw

Florida Forests
Fall 2001
Old World climbing fern

Some cursory research

Wildland Weeds
Spring 2006

Rain of spores
Most samples contained Lygodium fragments and spores
<table>
<thead>
<tr>
<th></th>
<th>Lygodium fragments</th>
<th>Gametophytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial treatment</td>
<td>61.6 %</td>
<td>96.1 %</td>
</tr>
<tr>
<td>Re-treatment</td>
<td>22.2 %</td>
<td>56.8 %</td>
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</table>
Kissimmee River
Sample from a shirt
= 1219 gametophytes
Some Conclusions

We can only make some general recommendations.

But.....think back to the spread of Hydrilla?
Don’t Create More Problems

- Applicators need to be more aware of moving propagules when working in an area with a high infestations of invasive plant propagules

- Keep vehicles out of undisturbed areas

- Do not move invasive plants or their parts around unless they are properly secured

- Limit disturbance to soil and native vegetation
Do not use swamp buggies or track vehicles in undisturbed natural areas

Minimize swamp buggies and track vehicle use to roads and heavily disturbed areas

Important Point:
Restrict movement of vehicles from infested to un-infested areas
So what can you as an applicator do?

1) Learn the biology of invasive plants
   i.e. – treat when seeds are not present if possible

2) Early detection and control of small invasive plant populations (corridors, access areas, disturbed areas, burned areas, etc.)

3) Minimize soil disturbance in areas with desired vegetation (i.e., stay out of undisturbed areas)

4) Minimize non-target damage if possible

5) Utilize herbicide control options such as basal bark or foliar treatment leaving plant material in place
So what can you as a manager/biologist do?

1) Review all contracts and include specific recommendations

2) Ask for an initial (and other random) inspection of applicators clothing and equipment prior to entering the project site

3) Conduct frequent site inspections during invasive plant control projects

4) Delineate staging areas and travel corridors for applicators in the project contract
   - Select weed-free sites

5) Document all areas where disturbance occurred

6) Education / kiosks – consider enlisting hikers, mountain bikers, horse back riders, etc.
Decontamination Recommendations

• Spray down all equipment with high pressure sprayer prior to leaving a site.
  - *Specifically when working in dense infestations of invasive plants*
  - *Use high pressure water or compressed air*
  - *Focus on treads, cracks, and crevices*

• Wash all clothing prior to working in another site.
  - *Focus on soil in shoes*
Decontamination Recommendations…continued

• Disposable suits are an option during cool weather, but make working conditions difficult in hot, humid weather.
  - *Bagged prior to leaving work site*

• Limit tracked vehicles and swamp buggies in areas heavily infested with invasive plants.
  - *Vehicles are most difficult to decontaminate and will require extra cleaning*
Questions

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