Invasive Weed Outreach in Nevada

Earl Creech
Extension Weed Specialist

The Early Years…
- Born and raised on a family dairy and crop production farm
  - Silver Sage Farms, Inc., Cornish, UT

My Education
- B.S. Utah State Univ. (2001)
- M.S. Utah State Univ. (2003)
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- B.S. Utah State Univ. (2001)
- M.S. Utah State Univ. (2003)
- Ph.D. Purdue Univ. (2007)

M.S. Research Project at USU

Ph.D. Research Project at Purdue

What does the Extension Weed Specialist do?
- Control Nevada’s weeds
- Enforce weed control laws

What does the Extension Weed Specialist do?
- Control Nevada’s weeds
- Enforce weed control laws
- Teach “the other person”
Mission statement of UNCE:
- To discover, develop, disseminate, preserve and use knowledge to strengthen the social, economic and environmental well-being of people.

Extension Weed Specialist
- Noxious, poisonous, and invasive weed management in Nevada
  - conduct applied research
  - provide timely and accurate information

Extension Program #1:
Statewide Needs Assessment
- formal surveys
- personal interaction
- industry trends
- issues from other states

Extension Program #2:
Weed Prevention
- Some interesting figures…
  - U.S. farmers and ranchers spend $12 billion for weed control each year
  - Invasive weeds are spreading at average rates of 11-18% per year

Where do new weeds come from?
What can we do?
1. Wait until a weed becomes a problem before doing something about it
   OR
2. Take steps to prevention weed invasion
   - *Always* the best strategy!
   - "An ounce of prevention is worth a pound of cure"

Weed Seed Movement
1. Crop seed, grain feed, hay, and straw

Dodder contaminated alfalfa seed
(planted at 20 lb per acre)

<table>
<thead>
<tr>
<th>Dodder seed by wt (%)</th>
<th>No. of dodder seeds sown per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001</td>
<td>160</td>
</tr>
<tr>
<td>0.01</td>
<td>1,600</td>
</tr>
<tr>
<td>0.1</td>
<td>16,000</td>
</tr>
<tr>
<td>0.25</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Weed Seed Movement
1. Crop seed, grain, hay, straw, and soil
2. Wind
3. Water
4. Animals and humans
What about seeds that are passed through an animal?

<table>
<thead>
<tr>
<th>Type of seed</th>
<th>Calves</th>
<th>Horses</th>
<th>Sheep</th>
<th>Chickens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field bindweed</td>
<td>22</td>
<td>6</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Sweetclover</td>
<td>14</td>
<td>15</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Velvetleaf</td>
<td>11</td>
<td>5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Smooth dock</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

% Viable seed:

Harmon and Kain (1934)

Weed Seed Movement

1. Crop seed, grain, hay, straw, and soil
2. Wind
3. Water
4. Animals and humans
5. Machinery

How do weeds invade a new area?

Public awareness typically begins

Introduction

Acres Infested

Control Costs

Time

Extension Program #3

Early Detection/Rapid Response

- Prevention is the ALWAYS the best strategy!
- Early detection is the second best strategy
  - Look for any unfamiliar plants
  - Control new infestations

Extension Program #4

Integrated Weed Management

- Use multiple methods to control weeds
  - Mechanical
  - Cultural
  - Biological
  - Chemical
Nevada’s Unique Weed Situation

Climate – Temp in January

<table>
<thead>
<tr>
<th>City</th>
<th>Ave. Temperature (°F)</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elko</td>
<td>37</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Tahoe</td>
<td>39</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Reno</td>
<td>45</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Las Vegas</td>
<td>57</td>
<td>34</td>
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</tr>
</tbody>
</table>

Climate - Temp in July

<table>
<thead>
<tr>
<th>City</th>
<th>Ave. Temperature (°F)</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elko</td>
<td>91</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Tahoe</td>
<td>78</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Reno</td>
<td>91</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Las Vegas</td>
<td>105</td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

Elevation

<table>
<thead>
<tr>
<th>City</th>
<th>Elevation (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elko</td>
<td>5,080</td>
</tr>
<tr>
<td>Tahoe</td>
<td>6,230</td>
</tr>
<tr>
<td>Reno</td>
<td>4,400</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>2,170</td>
</tr>
</tbody>
</table>

Climate - Annual Precipitation

<table>
<thead>
<tr>
<th>City</th>
<th>Ave. Precip. (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elko</td>
<td>10</td>
</tr>
<tr>
<td>Tahoe</td>
<td>32</td>
</tr>
<tr>
<td>Reno</td>
<td>7</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>4</td>
</tr>
</tbody>
</table>
Topography
- 314 mountain ranges in NV – most of any U.S. state

Source: www.destination360.com

Tahoe vs. Las Vegas
- 22% near Reno
- 71% near Las Vegas

Population
- 2.5 million NV residents in 2006
- 4.5% increase annually
- Led nation since 1940 (Arizona overtook NV in 2006 by 0.1%)
- Highest percentage of residents not born in the state

Land Usage/Ownership
- ~71 million acres in NV – 7th largest state
  - 86.5% controlled by federal government (highest of any state – Utah is #2 at 64%)
  - 68% BLM
  - 8% USFS
  - 11.5% privately owned
  - 2.4% owned by tribes, state and local government

Agriculture in Nevada
- 6.3 million acres in farms/ranches
- ~3,000 in the state
- Average size is 2,100 acres
  - U.S. average 444 acres
- Elko county ave. farm size is 6,227 acres (n=397)
- Clark county ave. farm size is 272 acres (n=253)

Source: Nevada Ag Statistics
Cash Receipts from Farm Marketings, NV, 2005

- Cattle & Calves: 44%
- Dairy Products: 16%
- All Hay: 22%
- Other Livestock: 4%
- Other crops: 5%
- Vegetables: 9%

Harvested Acreage, NV, 2005
- 485,000 Acres Harvested
- Other crops: wheat, barley, corn, alfalfa seed, potatoes, mint, onions, garlic (between 1,000 and 10,000 acres each)

Harvested Crop Value, NV, 2005
- All Hay: $195.2 million
- Onions: $31.7 million
- Potatoes: $11.8 million
- Other: (Small grains, mint, garlic, alfalfa seed) $11.5 million

Challenges in NV Agriculture
- Hobby farmers
- Declining profits
- Water
- Tradition