The intent of the Environmental Horticulture Survey was to poll growers, landscape care operators, researchers, extension personnel and others affiliated with this industry on needs and issues related to disease, insect, and weed management. The responses from the survey feed directly into how IR-4 allocates its research budget for environmental horticulture projects.

**Demographics of Survey Participants**

The purpose for several questions in this survey was to describe the demographics of participating growers, landscape care personnel and others in the green industry. The survey participants came from across the United States with responses unequally distributed among the four geographic regions (Table 1), with 45% from the western region. Sixty percent were growers with the next largest segment being extension personnel at 14% (Table 2). The operation types most represented were producers (greenhouse, nursery container, nursery field grown) (Table 3). Landscape care represented about 11% of the respondents. Very few survey participants selected more than one operation type (data not shown).

Relatively equal numbers of respondents identified themselves as using chemical control and/or IPM (Table 4). Nineteen percent used biological controls while 11% of survey participants used organic tools. Many participants did not choose a philosophy for when to apply, but those that did make applications when needed rather than based on a calendar.

Herbaceous perennials, shrubs and trees were grown by 13 – 14% of the respondents followed closely by bedding plants and ornamental grasses (Table 5). Fewer survey respondents grew seasonal potted plants, foliage plants, cut flowers, palms, and Christmas trees.

### Table 1. IR-4 Region for survey participants

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>NorthCentral</td>
<td>16</td>
<td>11%</td>
</tr>
<tr>
<td>Northeast</td>
<td>28</td>
<td>18%</td>
</tr>
<tr>
<td>Southern</td>
<td>39</td>
<td>26%</td>
</tr>
<tr>
<td>Western</td>
<td>69</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Table 2. Employment sector for survey participants (single selection option)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension</td>
<td>22</td>
<td>14%</td>
</tr>
<tr>
<td>Government</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Grower</td>
<td>92</td>
<td>60%</td>
</tr>
<tr>
<td>Industry</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Interiorscaper</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>LCP</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Researcher</td>
<td>17</td>
<td>11%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Table 3. Operation types (multiple selections)

<table>
<thead>
<tr>
<th>Production Site</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse</td>
<td>36</td>
<td>24%</td>
</tr>
<tr>
<td>Nursery Container</td>
<td>31</td>
<td>21%</td>
</tr>
<tr>
<td>Nursery Field</td>
<td>32</td>
<td>21%</td>
</tr>
<tr>
<td>Landscape</td>
<td>17</td>
<td>11%</td>
</tr>
<tr>
<td>Interiorscape</td>
<td>8</td>
<td>5%</td>
</tr>
<tr>
<td>Christmas Tree Farm</td>
<td>22</td>
<td>15%</td>
</tr>
<tr>
<td>Sod Farm</td>
<td>4</td>
<td>3%</td>
</tr>
</tbody>
</table>

### Table 4. Disease, insect and weed management styles (multiple selections)

<table>
<thead>
<tr>
<th>Management Styles</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Control</td>
<td>37</td>
<td>19%</td>
</tr>
<tr>
<td>Chemical Control</td>
<td>47</td>
<td>24%</td>
</tr>
<tr>
<td>IPM</td>
<td>44</td>
<td>23%</td>
</tr>
<tr>
<td>Organic</td>
<td>22</td>
<td>11%</td>
</tr>
<tr>
<td>Weekly/Monthly Sprays</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Spray at Thresholds</td>
<td>39</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Table 5. Spectrum of crops grown (multiple selections)

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedding Plants</td>
<td>25</td>
<td>11%</td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>21</td>
<td>9%</td>
</tr>
<tr>
<td>Christmas Trees</td>
<td>22</td>
<td>9%</td>
</tr>
<tr>
<td>Foliage Plants</td>
<td>16</td>
<td>7%</td>
</tr>
<tr>
<td>Perennials</td>
<td>34</td>
<td>14%</td>
</tr>
<tr>
<td>Ornamental Grasses</td>
<td>22</td>
<td>9%</td>
</tr>
<tr>
<td>Palms</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Seasonal Potted Plants</td>
<td>17</td>
<td>7%</td>
</tr>
<tr>
<td>Shrubs</td>
<td>32</td>
<td>13%</td>
</tr>
<tr>
<td>Trees</td>
<td>34</td>
<td>14%</td>
</tr>
<tr>
<td>Turf</td>
<td>11</td>
<td>5%</td>
</tr>
</tbody>
</table>
Type of Data Needed

Two questions solicited information on the general direction of research and the type of data needed in the program. The first question asked whether crop safety data was needed more than efficacy, efficacy more than crop safety, or both equally. The option for needing both crop safety and efficacy equally was highly selected (Figure 1) with more participants favoring efficacy data over crop safety.

Activities to Protect Beneficial Organisms including Pollinators

This was the third time a question was added to the survey to assess current practices used to protect beneficial organisms including pollinators during production and maintenance of plants.

There were 141 respondents to this question, and they were able to select multiple answers. The activity most employed was scouting for pest and disease hot spots and apply crop protection tools to only those areas (Figure 2). The next selection by frequency was applying crop protection tools when no beneficial organisms are present, followed by applying an optimal rate to manage pests or diseases without harming beneficial organisms. The next highest was applying the best tool possible for crop situation knowing that some beneficial organisms may be harmed followed by applying systemic tools when they offer greater safety than foliar tools.

Of note, the option to apply only biopesticides was the least selected followed by only applying biorationals.

Among the write-ins (Table 6, p3), most were geared towards cultural methods, timing or spot treatment.

Figure 1. Counts for type of data to be generated

![Figure 1. Counts for type of data to be generated](image)

Figure 2. Activities to protect beneficial organisms including pollinators (multiple selections)

<table>
<thead>
<tr>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>120</td>
</tr>
</tbody>
</table>

- Apply crop protection tools when no beneficials are present
- Grow crops without pollinator attractive flowers
- Apply only biopesticides
- Scout for pest and disease hot spots and apply to only those areas
- Apply best tool possible for crop situation knowing that some beneficial organisms may be harmed
- Apply foliar tools when they offer greater safety than systemic tools
- Grow flowering plants in greenhouses
- Apply biorational tools
- Use products without pollinator toxicity
- Apply optimal rate to manage pests or diseases without harming beneficial organisms
- Apply systemic tools when they offer greater safety than foliar tools
- Other...
Table 6. Comments included related to protecting beneficial organisms including pollinators

<table>
<thead>
<tr>
<th>Additional Activities Use to Protect Beneficial Organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage pollinators &amp; birds with habitats. We have 3 hives on our farm. We don't use pesticides or herbicides.</td>
</tr>
<tr>
<td>Use non-chemical strategies like crop isolation, physical removal where possible; early detection and treatment before</td>
</tr>
<tr>
<td>flowering, some mating disruption (oriental beetle)</td>
</tr>
<tr>
<td>Apply tool using herbal plant base for safer beneficial organism</td>
</tr>
<tr>
<td>don't produce plants</td>
</tr>
<tr>
<td>Emerald Ash Borer is the only insect we treat and rarely do we treat for plant disease</td>
</tr>
<tr>
<td>Use mechanical or biological tools or procedures first</td>
</tr>
<tr>
<td>Try to attract beneficial insects, remove and destroy infected trees, use insecticidal soaps and hand spray, basal prune</td>
</tr>
<tr>
<td>and have my trees more open to air circulation</td>
</tr>
<tr>
<td>compost tea</td>
</tr>
<tr>
<td>I have a tolerance threshold. If the pest exceeds our tolerance then we spray, we really don't like to spray if it will</td>
</tr>
<tr>
<td>harm pollinators.</td>
</tr>
<tr>
<td>apply by hand to target each tree rather than spraying entire area</td>
</tr>
<tr>
<td>Avoid pesticide use, use non-chemical controls whenever possible</td>
</tr>
<tr>
<td>I simply don't use any of the three chemicals I describe above during the brief period in early May / early seasonal</td>
</tr>
<tr>
<td>maturation, (not far enough seasonally progressed to inject) when ash trees are flowering (OSU Bee Lab has confirmed</td>
</tr>
<tr>
<td>that a minimal though</td>
</tr>
<tr>
<td>Reduce insect pests by increasing the diversity of flowering plants in landscapes to attract insects that are both</td>
</tr>
<tr>
<td>pollinators and enemies (predators or parasitoids) of plant pests</td>
</tr>
<tr>
<td>Growing flowering plants in greenhouses increases western flower thrips populations</td>
</tr>
</tbody>
</table>

Ranking of Issues by Discipline

Each of the issues within the disciplines listed by participants was given a weighted ranking based on the order written. Each was also assigned to a group based on similar diseases, pests, or weeds. This section also examines the survey responses grouped by production site.

Entomology

When all responses were grouped together the top five pests of concern were thrips, mites & spider mites, borers & beetles, scale & mealybugs, and aphids (Table 7, p3). Note that the calculation for weighted ranking here removes any duplication for crop or production site.

When weighted rankings were calculated for categories of crops, the top 5 pests changed for each crop type (Table 10, p5). One pest group was in all five crop types: mites & spider mites. Two were in four of the five: snails & slugs, and thrips. There was little consistency among the rest of the top five pests.

When the weighted rankings were calculated based on the production sites, there were some differences among the order, but 4 of the top 5 were similar (Table 11, p5). Four pest types were in the top five for each primary production site: mites & spider mites, scale & mealybugs, snails & slugs, and thrips. For greenhouse and nursery container, borers & beetles was the fifth

Table 7. Ranking of pests with limited management choices.

<table>
<thead>
<tr>
<th>Pest Group</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrips</td>
<td>69</td>
</tr>
<tr>
<td>Mites &amp; Spider Mites</td>
<td>61</td>
</tr>
<tr>
<td>Borers &amp; Beetles</td>
<td>58</td>
</tr>
<tr>
<td>Scale &amp; Mealybugs</td>
<td>48</td>
</tr>
<tr>
<td>Aphids</td>
<td>45</td>
</tr>
<tr>
<td>Whiteflies</td>
<td>27</td>
</tr>
<tr>
<td>Lepidopterans</td>
<td>12</td>
</tr>
<tr>
<td>Snails &amp; Slugs</td>
<td>11</td>
</tr>
<tr>
<td>Lygus</td>
<td>10</td>
</tr>
<tr>
<td>Fruit &amp; Nut Pests</td>
<td>9</td>
</tr>
<tr>
<td>Leafminers</td>
<td>8</td>
</tr>
<tr>
<td>Adelgids</td>
<td>8</td>
</tr>
<tr>
<td>Gall Insects</td>
<td>6</td>
</tr>
<tr>
<td>Mammals</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
<tr>
<td>Turf Pests</td>
<td>6</td>
</tr>
<tr>
<td>White Grubs &amp; Root Weevils</td>
<td>5</td>
</tr>
<tr>
<td>Midges</td>
<td>5</td>
</tr>
<tr>
<td>Plant Bugs</td>
<td>4</td>
</tr>
<tr>
<td>Public health pests</td>
<td>3</td>
</tr>
<tr>
<td>Leaf Hoppers</td>
<td>2</td>
</tr>
<tr>
<td>Flies, Sawflies &amp; Fungus Gnats</td>
<td>2</td>
</tr>
<tr>
<td>Wasp</td>
<td>2</td>
</tr>
</tbody>
</table>
pest group while for field in ground borers & beetles was tied with lepidopterans. For Landscape, lepidopterans was the fifth.

The specific pests mentioned most frequently included thrips (40) and aphids (27), but this does not take into consideration specific pests or those listed with host plants (Table 12, p5).

**Plant Pathology**

When all responses were grouped together, the top five diseases included bacterial diseases, Botrytis, Phytophthora & Pythium, leaf spots & anthracnose, and crown & root rots (Table 8, p4). The crown & root rot group contains diseases affecting roots, crowns, and lower trunks that are clearly not caused by Pythium or Phytophthora. Note that the calculation for weighted ranking here removes any duplication for crop or production site.

When the rankings were calculated based on the crop types there were some differences among the groups (Table 13, p8). Only bacterial diseases appeared in all crop types. Botrytis, crown & root rots (non-oomycete), leaf spots & anthracnose, Phytophthora & Pythium and powdery mildew all appeared in three crop types.

For the rankings grouped by production site, bacterial diseases, Botrytis, and Phytophthora & Pythium appeared in all four production sites. (Table 14, p8). Both crown & root rots and leaf spots & anthracnose categories appeared in three of the four production sites.

The specific diseases mentioned most frequently include botrytis (40) and powdery mildew (22), but this does not take into consideration specific pests or those listed with host plants (Table 15, p8). Plus, the largest emphasis for botrytis was related to peony growers from Alaska (data not shown).

**Table 8. Ranking of diseases with limited management choices.**

<table>
<thead>
<tr>
<th>Disease Group</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial Diseases</td>
<td>51</td>
</tr>
<tr>
<td>Botrytis</td>
<td>50</td>
</tr>
<tr>
<td>Phytophthora &amp; Pythium</td>
<td>45</td>
</tr>
<tr>
<td>Leaf Spots &amp; Anthracnose</td>
<td>44</td>
</tr>
<tr>
<td>Crown &amp; Root Rot</td>
<td>41</td>
</tr>
<tr>
<td>Powdery Mildew</td>
<td>24</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
</tr>
<tr>
<td>Downy Mildew</td>
<td>22</td>
</tr>
<tr>
<td>Rusts</td>
<td>18</td>
</tr>
<tr>
<td>Nematodes</td>
<td>16</td>
</tr>
<tr>
<td>Foliar Blights</td>
<td>14</td>
</tr>
<tr>
<td>Canker</td>
<td>9</td>
</tr>
<tr>
<td>Turf Diseases</td>
<td>7</td>
</tr>
<tr>
<td>Virus</td>
<td>3</td>
</tr>
<tr>
<td>Vascular Wilts</td>
<td>3</td>
</tr>
</tbody>
</table>

**Table 9. Ranking of weeds with limited management choices.**

<table>
<thead>
<tr>
<th>Weed Group</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaf - Perennial</td>
<td>57</td>
</tr>
<tr>
<td>Broadleaf - Summer Annual</td>
<td>33</td>
</tr>
<tr>
<td>Grasses</td>
<td>31</td>
</tr>
<tr>
<td>Horsetail &amp; Similar Weeds</td>
<td>25</td>
</tr>
<tr>
<td>Liverworts &amp; Moss &amp; Algae</td>
<td>20</td>
</tr>
<tr>
<td>Sedge &amp; Nutsedge</td>
<td>19</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
</tr>
<tr>
<td>Comment</td>
<td>15</td>
</tr>
<tr>
<td>Broadleaf - Biennial</td>
<td>15</td>
</tr>
<tr>
<td>Broadleaf - Winter Annual/Biennial</td>
<td>8</td>
</tr>
<tr>
<td>Vine - Perennial</td>
<td>4</td>
</tr>
<tr>
<td>Broadleaf - Winter Annual</td>
<td>4</td>
</tr>
<tr>
<td>Broadleaf - Annual/Perennial</td>
<td>3</td>
</tr>
<tr>
<td>Broadleaf</td>
<td>2</td>
</tr>
<tr>
<td>Vine - Winter/Summer Annual</td>
<td>2</td>
</tr>
<tr>
<td>Broadleaf - Annual</td>
<td>2</td>
</tr>
</tbody>
</table>

**Weed Science**

When all responses were grouped together, the top five weeds included Broadleaf Perennials, Broadleaf Summer Annuals, Grasses, Horsetail & Similar Weeds, and Liverworts & Moss & Algae (Table 9, p4). Note that the calculation for weighted ranking here removes any duplication for crop or production site.

Although there were some variations between rankings whether the responses are grouped together or separated by crop or production site, there was a general trend with broadleaf perennials, broadleaf summer annuals, and
liverworts & moss and algae in the top five weed types across crops and production sites (Table 16, Table 17, p11). Horsetails (Equisetum), liverwort, and wild carrot were identified most frequently as problematic weeds (Table 18, p11).

Table 10. Top 5 issues by crop category for Entomology.

<table>
<thead>
<tr>
<th>Bedding Plants &amp; Seasonal Potted Plants</th>
<th>Cut Flowers</th>
<th>Ornamental Grasses</th>
<th>Foliage &amp; Perennial Plants</th>
<th>Shrubs, Trees, Palms &amp; Christmas Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thrips (35)</td>
<td></td>
<td>Thrips (30)</td>
<td>Borers &amp; Beetles (51)</td>
</tr>
<tr>
<td>2</td>
<td>Whiteflies (22)</td>
<td></td>
<td>Mites &amp; Spider Mites (21)</td>
<td>Mites &amp; Spider Mites (43)</td>
</tr>
<tr>
<td>3</td>
<td>Mites &amp; Spider Mites (22)</td>
<td></td>
<td>Scale &amp; Mealybugs (18)</td>
<td>Scale &amp; Mealybugs (33)</td>
</tr>
<tr>
<td>4</td>
<td>Aphids (12)</td>
<td></td>
<td>Mites &amp; Spider Mites (4)</td>
<td>Borers &amp; Beetles (16)</td>
</tr>
<tr>
<td>5</td>
<td>Lepidopterans (10)</td>
<td></td>
<td>Thrips (3)</td>
<td>Snails &amp; Slugs (11)</td>
</tr>
</tbody>
</table>

Table 11. Top 5 issues by production site for Entomology.

<table>
<thead>
<tr>
<th>Greenhouse</th>
<th>Nursery Container</th>
<th>Nursery Field</th>
<th>Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thrips (81)</td>
<td>Mites &amp; Spider Mites (74)</td>
<td>Thrips (62)</td>
</tr>
<tr>
<td>2</td>
<td>Mites &amp; Spider Mites (69)</td>
<td>Borers &amp; Beetles (58)</td>
<td>Mites &amp; Spider Mites (48)</td>
</tr>
<tr>
<td>3</td>
<td>Scale &amp; Mealybugs (53)</td>
<td>Thrips (58)</td>
<td>Scale &amp; Mealybugs (18)</td>
</tr>
<tr>
<td>4</td>
<td>Borers &amp; Beetles (41)</td>
<td>Scale &amp; Mealybugs (48)</td>
<td>Scale &amp; Mealybugs (39)</td>
</tr>
<tr>
<td>5</td>
<td>Snails &amp; Slugs (40)</td>
<td>Snails &amp; Slugs (40)</td>
<td>Borers &amp; Beetles (34)</td>
</tr>
</tbody>
</table>

Table 12. Specific issues for each pest group.

<table>
<thead>
<tr>
<th>Pest Group</th>
<th>Pest</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelgids</td>
<td>Adelgid, fir</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Adelgid, silver fir</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Balsam woolly adelgid</td>
<td>3</td>
</tr>
<tr>
<td>Aphids</td>
<td>Aphid, fir</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Aphid, lily</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Aphids</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Aphids, bedding plants</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Aphids, true fir</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Oleander aphid, milkweek</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Root aphid, noble fir</td>
<td>3</td>
</tr>
<tr>
<td>Borers &amp; Beetles</td>
<td>Ambrosia beetle, woodies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Borers</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cucumber beetle, EHC field crops</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Flea beetle</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Ips</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Japanese beetle, rose</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Red headed flea beetle</td>
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<td></td>
<td>Red-headed flea beetle</td>
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<tr>
<td></td>
<td>South american palm weevil</td>
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<td></td>
<td>Twig borer, fir</td>
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<tr>
<td></td>
<td>Twig weevil</td>
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<td></td>
<td>Weevil, fir</td>
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<td>Flies, Sawflies &amp; Fungus Gnats</td>
<td>Fungus gnats, poinsettia</td>
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<td>Fungus gnats, shorefly</td>
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<td>Fruit &amp; Nut Pests</td>
<td>Ambrosia beetle, avocado</td>
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<td>Pest Group</td>
<td>Pest</td>
<td>Weighted Ranking</td>
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<td></td>
<td>Spotted wing drosophila</td>
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<td>Gall Insects</td>
<td>Gall wasps, midges</td>
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<td>Leaf/stem gall, oak</td>
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<td>Leaf Hoppers</td>
<td>Leafhopper, rosemary</td>
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<td>Leafminers</td>
<td>Leafminer</td>
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<td>Bagworms, arborvitae</td>
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<td>Caterpillars</td>
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<td>Lygus, peony</td>
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<td>Mites &amp; Spider Mites</td>
<td>Douglas fir needle midge</td>
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<td>Needle midge</td>
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<td>Broad mite</td>
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<td>Eriophyid mite</td>
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<td>Eriophyid mite, conifers</td>
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<td>Mites</td>
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<td>Mites, choisya</td>
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<td>Olive mite</td>
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<td>Two spotted spider mites</td>
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<td>Armored cale</td>
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<td>Armored scale, magnolia white scale</td>
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<td>Scale &amp; Mealybugs</td>
<td>Armored scale, woodies</td>
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<td>Citrus mealybug</td>
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<td>Crapemyrtle bark scale</td>
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<td>Honeydew mealybug, phormium &amp; cordyline</td>
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<td>Scale &amp; Mealybugs</td>
<td>Japanese maple scale</td>
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<td>Scale &amp; Mealybugs</td>
<td>Lobate scales</td>
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<tr>
<td>Scale &amp; Mealybugs</td>
<td>Long tailed mealybug</td>
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<td>Scale &amp; Mealybugs</td>
<td>Mealybug</td>
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<td>Scale &amp; Mealybugs</td>
<td>Mealybug, ruscus</td>
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<td>Scale &amp; Mealybugs</td>
<td>Oystershell scale</td>
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<td>Scale &amp; Mealybugs</td>
<td>Scale</td>
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<td>Scale &amp; Mealybugs</td>
<td>Scale, holly</td>
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<tr>
<td>Scale &amp; Mealybugs</td>
<td>Scale, woodies</td>
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<tr>
<td>Snails &amp; Slugs</td>
<td>Amber snail</td>
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<td>Snails &amp; Slugs</td>
<td>Slugs</td>
<td>3</td>
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<tr>
<td>Snails &amp; Slugs</td>
<td>Snail &amp; slug</td>
<td>3</td>
</tr>
<tr>
<td>Snails &amp; Slugs</td>
<td>Snails</td>
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</tr>
<tr>
<td>Pest Group</td>
<td>Pest</td>
<td>Weighted Ranking</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>White garden snail</td>
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</tr>
<tr>
<td>Thrips</td>
<td>Chili thrips, distyllium</td>
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</tr>
<tr>
<td></td>
<td>Chili thrips, nuttall oak</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Onion thrips</td>
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</tr>
<tr>
<td></td>
<td>Thrips</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Thrips, dahlia &amp; gerbera</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Thrips, lily</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thrips, peony</td>
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<tr>
<td></td>
<td>Western flower thrips</td>
<td>11</td>
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<td></td>
<td>Western flower thrips, impatiens</td>
<td>3</td>
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<tr>
<td>Turf Pests</td>
<td>Rhodesgrass mealybug, bermudagrass</td>
<td>6</td>
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<tr>
<td>Wasp</td>
<td>Megastigmus</td>
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<tr>
<td>White grubs &amp; Root Weevils</td>
<td>June bug - larvae</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Root weevil</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Strawberry root worm</td>
<td>1</td>
</tr>
<tr>
<td>Whiteflies</td>
<td>Bemisia tabaci Q</td>
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<tr>
<td></td>
<td>Whiteflies</td>
<td>18</td>
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<td></td>
<td>Whitefly, hibiscus</td>
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<tr>
<td></td>
<td>Whitefly, poinsettia</td>
<td>6</td>
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</tbody>
</table>
Table 13. Top 5 issues by crop category for Plant Pathology.

<table>
<thead>
<tr>
<th>Bedding Plants &amp; Seasonal Potted Plants</th>
<th>Cut Flowers</th>
<th>Ornamental Grasses</th>
<th>Foliage &amp; Perennial Plants</th>
<th>Shrubs, Trees, Palms &amp; Christmas Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Crown &amp; Root Rot (21)</td>
<td>Botrytis (38)</td>
<td>Bacterial Diseases (6) *</td>
<td>Botrytis (21)</td>
<td>Leaf Spots &amp; Anthracnose (33)</td>
</tr>
<tr>
<td>2 Bacterial Diseases (19)</td>
<td>Crown &amp; Root Rot (9)</td>
<td>Turf Diseases (5)</td>
<td>Bacterial Diseases (19)</td>
<td>Bacterial Diseases (28)</td>
</tr>
<tr>
<td>3 Phytophthora &amp; Pythium (18)</td>
<td>Bacterial Diseases (6)</td>
<td>Rusts (4)</td>
<td>Phytophthora &amp; Pythium (14)</td>
<td>Phytophthora &amp; Pythium (24)</td>
</tr>
<tr>
<td>4 Downy Mildew (18)</td>
<td>Leaf Spots &amp; Anthracnose (4)</td>
<td>Powdery Mildew (3)</td>
<td>Crown &amp; Root Rot (14)</td>
<td>Foliar Blights (14)</td>
</tr>
<tr>
<td>5 Botrytis (16)</td>
<td>Powdery Mildew (4) Rusts (4)</td>
<td>Nematodes (3)</td>
<td>Leaf Spots &amp; Anthracnose (11) Nematodes (11)</td>
<td>Powdery Mildew (12)</td>
</tr>
</tbody>
</table>

*Note: Ornamental grasses are not known to be susceptible to bacterial disease infections.*

Table 14. Top 5 issues by production site for Plant Pathology.

<table>
<thead>
<tr>
<th>Greenhouse</th>
<th>Nursery Container</th>
<th>Nursery Field</th>
<th>Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bacterial Diseases (66)</td>
<td>Bacterial Diseases (62)</td>
<td>Bacterial Diseases (52)</td>
<td>Bacterial Diseases (26)</td>
</tr>
<tr>
<td>2 Crown &amp; Root Rot (48)</td>
<td>Phytophthora &amp; Pythium (36)</td>
<td>Botrytis (50)</td>
<td>Phytophthora &amp; Pythium (19)</td>
</tr>
<tr>
<td>4 Botrytis (40)</td>
<td>Botrytis (25)</td>
<td>Leaf Spots &amp; Anthracnose (27)</td>
<td>Botrytis (12)</td>
</tr>
<tr>
<td>5 Downy Mildew (33)</td>
<td>Leaf Spots &amp; Anthracnose (22)</td>
<td>Crown &amp; Root Rot (25)</td>
<td>Powdery Mildew (10)</td>
</tr>
</tbody>
</table>

Table 15. Specific issues for each disease group

<table>
<thead>
<tr>
<th>Disease Group</th>
<th>Disease/Pathogen *</th>
<th>Weighted Ranking</th>
</tr>
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<tbody>
<tr>
<td>Bacterial Diseases</td>
<td>Bacteria</td>
<td>20</td>
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<tr>
<td>Bacterial Diseases</td>
<td>Bacterial leaf spot</td>
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<tr>
<td>Bacterial Diseases</td>
<td>Erwinia</td>
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<tr>
<td>Bacterial Diseases</td>
<td>Erwinia in propagation</td>
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</tr>
<tr>
<td>Bacterial Diseases</td>
<td>Fire blight</td>
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</tr>
<tr>
<td>Bacterial Diseases</td>
<td>Pseudomonas</td>
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<td>Pseudomonas, woodies</td>
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<tr>
<td>Bacterial Diseases</td>
<td>Xanthomonas</td>
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<tr>
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<td>Xanthomonas, prunus</td>
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<td>Botrytis</td>
<td>Botrytis</td>
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<td>Botrytis</td>
<td>Botrytis - biocontrols</td>
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<td>Botrytis</td>
<td>Botrytis, peony</td>
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<tr>
<td>Canker</td>
<td>Botryosphaeria</td>
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<tr>
<td>Canker</td>
<td>Canker (Grovesiella sp)</td>
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<td>Phoma</td>
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<td>Canker</td>
<td>Phomopsis</td>
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<td>Crown &amp; Root Rot</td>
<td>Armillaria</td>
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<td>Fusarium</td>
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<td>Fusarium, chrysanthemum</td>
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<td>Rhizoctonia</td>
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<td>Rhizoctonia, woodies</td>
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<td>Disease Group</td>
<td>Disease/Pathogen *</td>
<td>Weighted Ranking</td>
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<tr>
<td>-----------------------------</td>
<td>------------------------------------------------------------------------------------</td>
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<tr>
<td>Root rot</td>
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<td>Sclerotium rolfsii</td>
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<td>Soil borne diseases</td>
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<td>Tulip bulb diseases</td>
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<td>Downy mildew, hellebore</td>
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<td>Downy mildew, phlox</td>
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<tr>
<td>Foliar Blights</td>
<td>Interior Needle Blight</td>
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<td>Needle necrosis</td>
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<td>Leaf Spots &amp; Anthracnose</td>
<td>Anthracnose</td>
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<td>Apple scab</td>
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<td>Needle cast, Scot Pine</td>
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<td>Frasier fir death</td>
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<td>Geotrichum</td>
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<td>Rusts</td>
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<td>Disease Group</td>
<td>Disease/Pathogen *</td>
<td>Weighted Ranking</td>
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<td>--------------------</td>
<td>--------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Rust, grand fir</td>
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<td>Rust, Guava</td>
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<tr>
<td>Rust, heuchera</td>
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<td>3</td>
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<tr>
<td>Rust, ornamental grass</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Turf Diseases</td>
<td>Bermuda grass decline</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Brown patch</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Dollar spot</td>
<td>3</td>
</tr>
<tr>
<td>Vascular Wilts</td>
<td>Wilt, laurel</td>
<td>3</td>
</tr>
<tr>
<td>Virus</td>
<td>Rose Rosette Virus</td>
<td>3</td>
</tr>
</tbody>
</table>

*The authors standardized the format for presenting diseases and pathogens. In parentheses are Latin names, where either mentioned by survey participants or when specific diseases were mentioned to foster clarity (i.e., rusts). Where crops were mentioned, the disease or pathogen is listed first followed by a comma and one or more crops.
### Table 16. Top 5 issues by crop category for Weed Science.

<table>
<thead>
<tr>
<th>Bedding Plants &amp; Seasonal Potted Plants</th>
<th>Cut Flowers</th>
<th>Ornamental Grasses</th>
<th>Foliage &amp; Perennial Plants</th>
<th>Shrubs, Trees, Palms &amp; Christmas Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Liverworts &amp; Moss &amp; Algae (12)</td>
<td>Grass (12)</td>
<td>Liverworts &amp; Moss &amp; Algae (17)</td>
<td>Broadleaf - Perennial (26)</td>
<td>Broadleaf - Perennial (35)</td>
</tr>
<tr>
<td>2 Broadleaf - Perennial (10)</td>
<td>Broadleaf - Perennial (12)</td>
<td>Broadleaf - Perennial (14)</td>
<td>Liverworts &amp; Moss &amp; Algae (18)</td>
<td>Broadleaf - Summer Annual (21)</td>
</tr>
<tr>
<td>3 Broadleaf - Winter Annual/Biennial (5)</td>
<td>Broadleaf - Summer Annual (9)</td>
<td>Broadleaf - Summer Annual (8)</td>
<td>Broadleaf - Summer Annual (11)</td>
<td>Horsetail &amp; Similar Weeds (19)</td>
</tr>
<tr>
<td>4 Grass (3)</td>
<td>Horsetail &amp; Similar Weeds (6)</td>
<td>Grass (6)</td>
<td>Broadleaf - Winter Annual/Biennial (5)</td>
<td>Broadleaf - Biennial (15)</td>
</tr>
</tbody>
</table>

### Table 17. Top 5 issues by production site for Weed Science

<table>
<thead>
<tr>
<th>Greenhouse</th>
<th>Nursery Container</th>
<th>Nursery Field</th>
<th>Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Broadleaf - Perennial (79)</td>
<td>Broadleaf - Perennial (75)</td>
<td>Broadleaf - Perennial (72)</td>
<td>Broadleaf - Perennial (54)</td>
</tr>
<tr>
<td>2 Liverworts &amp; Moss &amp; Algae (61)</td>
<td>Liverworts &amp; Moss &amp; Algae (47)</td>
<td>Liverworts &amp; Moss &amp; Algae (47)</td>
<td>Broadleaf - Summer Annual (19)</td>
</tr>
<tr>
<td>3 Broadleaf - Summer Annual (37)</td>
<td>Broadleaf - Summer Annual (30)</td>
<td>Broadleaf - Summer Annual (40)</td>
<td>Vine - Perennial (8)</td>
</tr>
<tr>
<td>4 Broadleaf - Winter Annual/Biennial (20)</td>
<td>Sedge &amp; Nutsedge (15)</td>
<td>Horsetail &amp; Similar Weeds (16)</td>
<td>Liverworts &amp; Moss &amp; Algae (6)</td>
</tr>
<tr>
<td>5 Grass (13)</td>
<td>Vine - Perennial (10) Horsetail &amp; Similar Weeds (10)</td>
<td>Grass (16)</td>
<td>Grass (6) Broadleaf – Winter Annual (6)</td>
</tr>
</tbody>
</table>

### Table 18. Specific issues for each weed group.

<table>
<thead>
<tr>
<th>Weed Group</th>
<th>Weed</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaf</td>
<td>Bindweed</td>
<td>2</td>
</tr>
<tr>
<td>Broadleaf - Annual</td>
<td>Parthonium</td>
<td>2</td>
</tr>
<tr>
<td>Broadleaf - Annual/Perennial</td>
<td>Oxalis</td>
<td>3</td>
</tr>
<tr>
<td>Broadleaf - Biennial</td>
<td>Queen Anne's Lace</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wild Carrot</td>
<td>12</td>
</tr>
<tr>
<td>Broadleaf - Perennial</td>
<td>Canada Thistle</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Chickweed</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Clover</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Dandelion</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>False Dandelion</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Fig buttercup</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Fireweed</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Horse nettle</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Meadow fleabane</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Multiflora rose</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Northern Willowherb</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Oxalis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Perennial Weeds</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rorippa sylvestris</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Violet</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Willowherb</td>
<td>3</td>
</tr>
<tr>
<td>Weed Group</td>
<td>Weed</td>
<td>Weighted Ranking</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Broadleaf - Summer Annual</td>
<td>Yarrow</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Asian mustard</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Bidens</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Eclipta</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Euphorbia</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fumewort</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Globe camomile</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hairy Fleabane</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Mallow</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pigweed</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Prostrate Spurge</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Ragweed</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Small flower stock (invasive)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Smartweed</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Spurge</td>
<td>4</td>
</tr>
<tr>
<td>Broadleaf - Winter Annual</td>
<td>Groundsel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Horseweed</td>
<td>3</td>
</tr>
<tr>
<td>Broadleaf - Winter Annual/Biennial</td>
<td>Bittercress</td>
<td>8</td>
</tr>
<tr>
<td>Comment</td>
<td>Need pre-emergents</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Peony - Virtually no effective products registered</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pre emergent weed control</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Pre-emergent herbicide w/ 90+ day control</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Round up resistant weeds and grasses</td>
<td>3</td>
</tr>
<tr>
<td>Grass</td>
<td>Crabgrass</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Dallisgrass</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Eragrostis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Goosegrass</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Grass</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Johnsongrass</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Roughstalk Bluegrass</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Ryegrass</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Smutgrass</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wild grass</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Witch grass (Panicum capillare)</td>
<td>1</td>
</tr>
<tr>
<td>Horsetail &amp; Similar Weeds</td>
<td>Equisetum</td>
<td>25</td>
</tr>
<tr>
<td>Liverworts &amp; Moss &amp; Algae</td>
<td>Liverwort</td>
<td>16</td>
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<tr>
<td></td>
<td>Moss</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nostoc Algae</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>All weeds</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>All weeds, greenhouse</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Broadleaf weeds, grasses</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Glyphosate</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Native weeds</td>
<td>3</td>
</tr>
<tr>
<td>Sedge &amp; Nutsedge</td>
<td>Kyllinga</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nutgrass</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nutsedge</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Yellow Nutsedge</td>
<td>9</td>
</tr>
<tr>
<td>Vine - Perennial</td>
<td>Convolvululus</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Porcelain vine</td>
<td>2</td>
</tr>
<tr>
<td>Vine - Winter/Summer Annual</td>
<td>Morning glory</td>
<td>2</td>
</tr>
</tbody>
</table>
## Region Specific Results

### Table 19. Top issues in each discipline by region

<table>
<thead>
<tr>
<th>Discipline</th>
<th>North Central</th>
<th>Northeast</th>
<th>Southern</th>
<th>Western</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entomology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Borers &amp; Beetles (6)</td>
<td>Thrips (11)</td>
<td>Scale &amp; Mealybugs (28)</td>
<td>Thrips (42)</td>
</tr>
<tr>
<td></td>
<td>Mites &amp; Spider Mites (6)</td>
<td>Mites &amp; Spider Mites (10)</td>
<td>Borers &amp; Beetles (27)</td>
<td>Aphids (35)</td>
</tr>
<tr>
<td>2</td>
<td>Lepidopterans (5)</td>
<td>Borers &amp; Beetles (10)</td>
<td>Mites &amp; Spider Mites (16)</td>
<td>Mites &amp; Spider Mites (29)</td>
</tr>
<tr>
<td>3</td>
<td>Whiteflies (3)</td>
<td>Mites &amp; Spider Mites (10)</td>
<td>Thrips (14)</td>
<td>Borers &amp; Beetles (15)</td>
</tr>
<tr>
<td>4</td>
<td>Aphids (3)</td>
<td>Thrips (7)</td>
<td>Lepidopterans (7)</td>
<td>Whiteflies (14)</td>
</tr>
<tr>
<td><strong>Pathology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Phytophthora &amp; Pythium (12)</td>
<td>Crown &amp; Root Rot (16)</td>
<td>Bacterial Diseases (25)</td>
<td>Botrytis (45)</td>
</tr>
<tr>
<td>2</td>
<td>Other (6)</td>
<td>Leaf Spots &amp; Anthracnose (15)</td>
<td>Leaf Spots &amp; Anthracnose (14)</td>
<td>Crown &amp; Root Rot (20)</td>
</tr>
<tr>
<td>3</td>
<td>Botrytis (5)</td>
<td>Bacterial Diseases (12)</td>
<td>Phytophthora &amp; Pythium (13)</td>
<td>Phytophthora &amp; Pythium (18)</td>
</tr>
<tr>
<td>4</td>
<td>Leaf Spots &amp; Anthracnose (4)</td>
<td>Downy Mildew (6)</td>
<td>Downy Mildew (6)</td>
<td>Rusts (16)</td>
</tr>
<tr>
<td>5</td>
<td>Bacterial Diseases (4)</td>
<td>Nematodes (5)</td>
<td>Other (6)</td>
<td>Foliar Blights (14)</td>
</tr>
<tr>
<td><strong>Weed Science</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Broadleaf - Perennial (21)</td>
<td>Grass (10)</td>
<td>Broadleaf - Summer Annual (10)</td>
<td>Broadleaf - Perennial (29)</td>
</tr>
<tr>
<td>2</td>
<td>Broadleaf - Summer Annual (5)</td>
<td>Broadleaf - Perennial (6)</td>
<td>Sedge &amp; Nutsedge (6)</td>
<td>Horsetail &amp; Similar Weeds (22)</td>
</tr>
<tr>
<td>3</td>
<td>Horsetail &amp; Similar Weeds (3)</td>
<td>Other (6)</td>
<td>Liverworts &amp; Moss &amp; Algae (4)</td>
<td>Broadleaf - Summer Annual (18)</td>
</tr>
<tr>
<td>4</td>
<td>Other (3)</td>
<td>Liverworts &amp; Moss &amp; Algae (6)</td>
<td>Grass (3)</td>
<td>Grass (18)</td>
</tr>
<tr>
<td>5</td>
<td>Comment (2)</td>
<td>Algae (6)</td>
<td>Other (3)</td>
<td>Broadleaf - Biennial (15)</td>
</tr>
</tbody>
</table>

Cell values represent issues with greatest incidence in each region.
Table 20. Specific issues for the North Central region by discipline

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Pest/Disease/Weed Group</th>
<th>Pest</th>
<th>Weighted Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entomology</td>
<td>Aphids</td>
<td>Oleander aphid, milkweek</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Borers &amp; Beetles</td>
<td>Flea beetle</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japanese beetle, rose</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Gall Insects</td>
<td>Gall wasps, midges</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Lepidopterans</td>
<td>Bagworms, arborvitae</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caterpillars</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mites &amp; Spider Mites</td>
<td>Eriophyid mite</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mites</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Plant Bugs</td>
<td>Four-lined plant bug</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Thrips</td>
<td>Thrips</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Whiteflies</td>
<td>Whiteflies</td>
<td>3</td>
</tr>
<tr>
<td>Pathology</td>
<td>Bacterial Diseases</td>
<td>Bacteria</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xanthomonas</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Botrytis</td>
<td>Botrytis</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Canker</td>
<td>Botryosphaeria</td>
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</tr>
<tr>
<td></td>
<td>Leaf Spots &amp; Anthracnose</td>
<td>Apple scab</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Needle cast</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nematodes</td>
<td>Nematode, root knot</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Algae</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fungal disease</td>
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</tr>
<tr>
<td></td>
<td>Phytophthora &amp; Pythium</td>
<td>Phytophthora</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phytophthora &amp; Pythium</td>
<td>3</td>
</tr>
<tr>
<td></td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>Powdery Mildew</td>
<td>Powdery Mildew</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Rusts</td>
<td>Rust</td>
<td>2</td>
</tr>
<tr>
<td>Weed Science</td>
<td>Broadleaf - Perennial</td>
<td>Canada Thistle</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chickweed</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dandelion</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fig buttercup</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Meadow fleabane</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multiflora rose</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Perennial Weeds</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rorippa sylvestris</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Broadleaf - Summer Annual</td>
<td>Mallow</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pigweed</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Broadleaf - Winter Annual</td>
<td>Groundsel</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Comment</td>
<td>Pre-emergent herbicide w/ 90+ day control</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Horsetail &amp; Similar Weeds</td>
<td>Equisetum</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Broadleaf weeds, grasses</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Vine - Perennial</td>
<td>Porcelain vine</td>
<td>2</td>
</tr>
<tr>
<td>Discipline</td>
<td>Pest/Disease/Weed Group</td>
<td>Pest</td>
<td>Weighted Ranking</td>
</tr>
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<td>----------------------------</td>
<td>----------------------------------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Entomology</td>
<td><strong>Aphids</strong></td>
<td>Aphids</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Borers &amp; Beetles</strong></td>
<td>Borers</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Red-headed flea beetle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Fruit &amp; Nut Pests</strong></td>
<td>Cherry fruit worm</td>
<td>3</td>
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