

# Adapting your yard and garden for climate change

**Weston Miller**  
**OSU Extension Service**  
**January 2019**



**Oregon State University**  
Extension Service

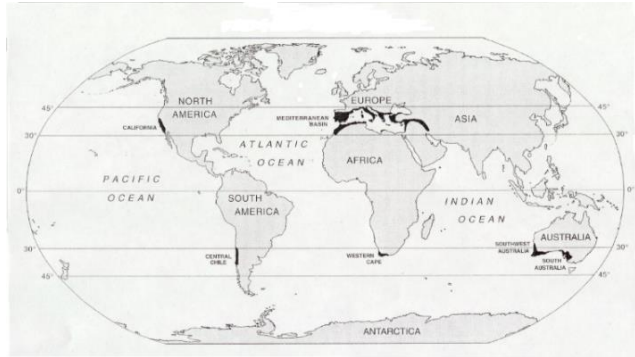
# Preview of presentation

- **Historical climate of the Northwest**
- **The evidence about climate change is clear**
- **What should we expect in the future?**
- **What's a gardener/landscaper to do?**
- **What's a Master Gardener to do?**
- **What's OSU doing in terms of research and extension about climate change?**



# The historical climate of the Northwest

- Mild, wet winters
- Warm, dry summers



# Not enough water?

Study: County demand may outpace its supply

BY CRAIG COLEMAN  
coleman@englenewspapers.com

POLK COUNTY - The demand for drinking water in Polk County in 2040 will outpace what's available in its collective supplies during peak months by almost 13 million gallons a day.

That's the prognosis of an in-depth analysis completed in October involving representatives from the county's cities and water providers.

The same report, entitled the Regional Water Supply Strategy, also recommends creating a county-wide resource, using a treatment plant to divert water from the Willamette River to deficient areas, as the most viable solution to the problem.

That would entail either revamping an existing treatment facility at Adair Village or constructing a new one near Independence. The cost for either option: roughly \$70 million.

Almost two years ago, Polk County Commissioners created an advisory committee to evaluate the lack of viable long-term water resources in the region and to research a reliable supply source.

That group, with members from five incorporated cities and eight water associations and co-ops, presented their recommendations last week.

The issue of water scarcity seems a distant problem right now, said Commissioner Phil Walker.

"But if we don't take the necessary steps, we will be suffering for lack of water in the future," he also said. "And the whole net of our constituents will be asking, 'Why didn't we act on this sooner?'"

Projected demand was calculated by using population growth estimates and the gallons per capita day for each of the entities. The county will grow to almost 90,000 residents by 2040, according to the study.

Consultants from Engineering and Economic Services, Inc., who performed the report, excluded West Salem from that fig-

*"If we don't take the necessary steps, we will be suffering for lack of water in the future. And the whole net of our constituents will be asking why we didn't act sooner."*

— Phil Walker

ure and the analysis because the area receives its water from the City of Salem.

Most parts of the county get water from wells and other ground sources. Dallas, Willamina and the Buell Red Prairie and Rock Creek Water districts also use some surface water from reservoirs.

According to the study, 75 percent of the future deficit can be attributed to the three largest county cities. Dallas, could be experiencing a shortfall during peak demand in the summer by 2006.

Independence and Monmouth are expected to exceed their supplies during high-use periods in 2013 and 2026, respectively. Willamina is the only incorporated city where demand won't outstrip resources.

As a whole, the county will be deficient by an average of 13 million gallons per day (mgd) by 2040. The average daily demand for water was under 7 mgd in 2000.

The study looked at almost a dozen alternative water supply options, from expanding groundwater sites near Rickreall to constructing a reservoir in Yamhill County. The objective was to design a regional source from which all the entities could incrementally draw water from as need arises.

All of the parties involved in the study would form a regulatory body that would oversee distribution. The existing water supplies - and surplus - of all of the parties would not be threatened.

The two most feasible solutions involve diversion and treatment plants along the Willamette at one of two points, either Adair Village or near Independence.

The county has a water right agreement in place with the City of Adair Village,

which resides in Benton County.

Polk officials may buy or transfer part that right to a location on the river that would better serve residents of this county.

The \$72 million Adair Village option would see a retrofit of its treatment plant built during World War II.

The system has a current production capacity of 2.3 mgd, and only uses 6 mgd for local customers.

The proposed improvements would be completed in four phases over the next four decades, until the plant was capable of producing as much as 12 mgd.

Transmission lines would have to be built to carry water from the facility to three main cities, then to the other parts of the county.

The second option is a new river intake and treatment plant near Independence, \$68 million. Distributing the water would be less costly than the Adair Village project, but would require more extensive treatment to meet state and federal drinking water standards because it's located downstream of industrial sites in Albany.

Both options would require water providers to secure water rights on the Willamette.

Revenue bonds would be used to finance the majority of the up-front cost of construction. Wholesale rates, system development charges and debt would fund operation of the entity.

With the technical portion of the search complete, the water providers still need to select one of the alternatives, and decide what type of organizational framework they would form to oversee the regional water source.

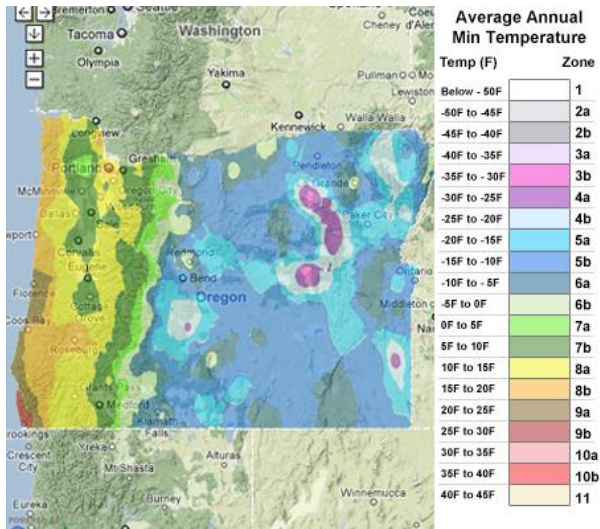
The county will be forming a policy committee consisting of the mayors of each city and water district heads to make the final decisions.

Commissioners in the past have said the county would not be involved in selling water. Other possibilities for a governing body include a people's utility district, water authority or intergovernmental agency. All of the options allow for issuance of revenue bonds.

Each carries its own risk. For example, an intergovernmental agency formed under Oregon statute could make the all of the participants liable for the financial activity of the other parties or the regional entity a whole.

Drought happens...  
• Seasonally  
• Regionally

# USDA Hardiness Zone 8a and 8b



**Expect lows  
from 10 – 20 °F**



# ZONE 6: The Willamette and Columbia River Valleys

Growing season 280  
days in Portland  
neighborhoods

40 to 55 inches of  
annual precipitation

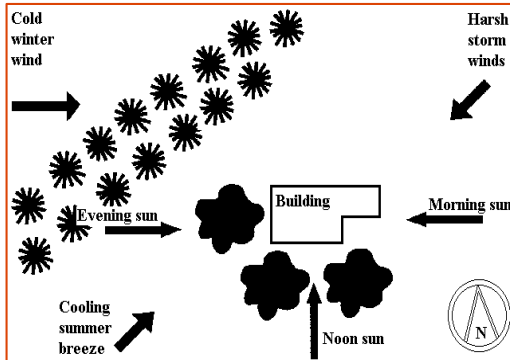
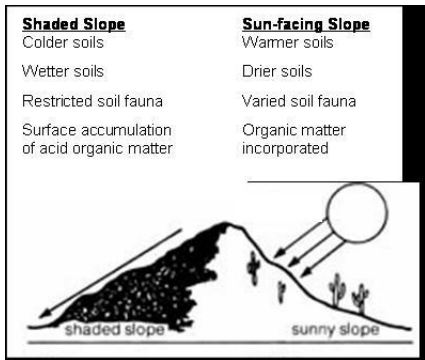
Ten-year extreme  
lows average 0 to 10°F

[Sunset Zone descriptions](#)

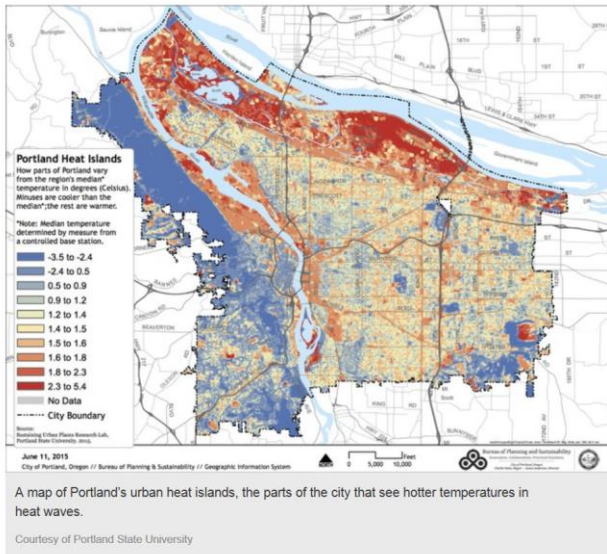


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# Microclimate: It depends on your location



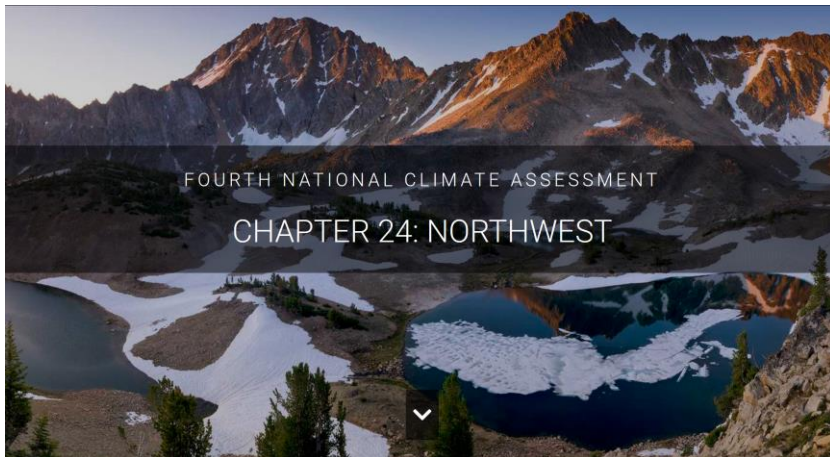
# Urban heat islands



<https://www.opb.org/news/article/mapping-portlands-hottest-places/>



# The evidence about climate change is clear



<https://nca2018.globalchange.gov/chapter/24/>

# Detroit Lake – Summer 2015



<https://nca2018.globalchange.gov/chapter/24/>

# Detroit Lake – Summer 2018

Toxic algae blooms found in parts of Detroit Lake, Oregon health officials warn

by KATU Staff | Wednesday, May 23rd 2018



ec57916-de87-4f07-bf8f-25a182bd59f8-080521\_detroit\_lake.jpg

<https://katu.com/news/local/toxic-blue-green-algae-found-in-parts-of-detroit-lake-oregon-health-officials-warn>

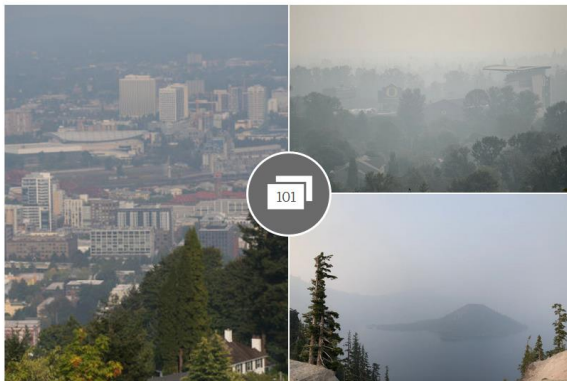


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# Summer 2017 and Summer 2018

## Portland air quality updates: Latest wildfire smoke forecast

Updated Aug 23, 2018; Posted Aug 23, 2018



Gallery: Wildfire smoke and unhealthy air conditions on the West Coast

[https://www.oregonlive.com/portland/index.ssf/2018/08/portland\\_air\\_quality\\_updates\\_l.html](https://www.oregonlive.com/portland/index.ssf/2018/08/portland_air_quality_updates_l.html)

What we can expect in the future

***The frequency and  
intensity of extreme  
weather will increase!***



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# Fire preparedness

PBSO NEWS HOUR

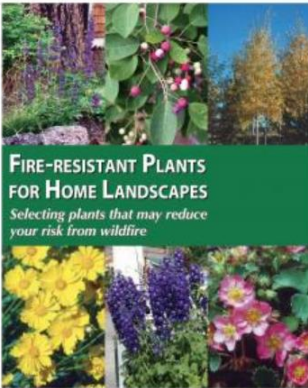


By Gretchen Frame

## How climate change is changing your insurance

17

Making Smaller Nov 27, 2018 4:00 PM EST



### FIRE-RESISTANT PLANTS FOR HOME LANDSCAPES

*Selecting plants that may reduce your risk from wildfire*

PNW 530 • August 2016

A Pacific Northwest Extension publication  
Oregon State University • Washington State University • University of Idaho

# Aberrant freezing and snow patterns – Both early and late season



**Evergreen shrubs  
are vulnerable to  
snow load**

**Early/late  
flowerings/fruiting  
varieties harder to  
grow**



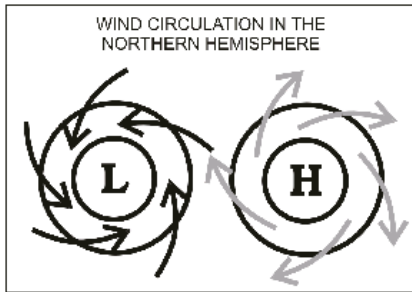
# Aberrant freezing and snow patterns – Both early and late season

Freezing rain can  
damage plants,  
especially big trees





# Think about wind gusts and trees on your property



Winds blow counter-clockwise into an area of low pressure and clockwise around and out of an area of high pressure.

Storm winds  
from the SE



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# Wind storms



# Warmer temperatures boosts insect activity

## Climate change projected to boost insect activity and crop loss, researchers say

James Urton

UW News

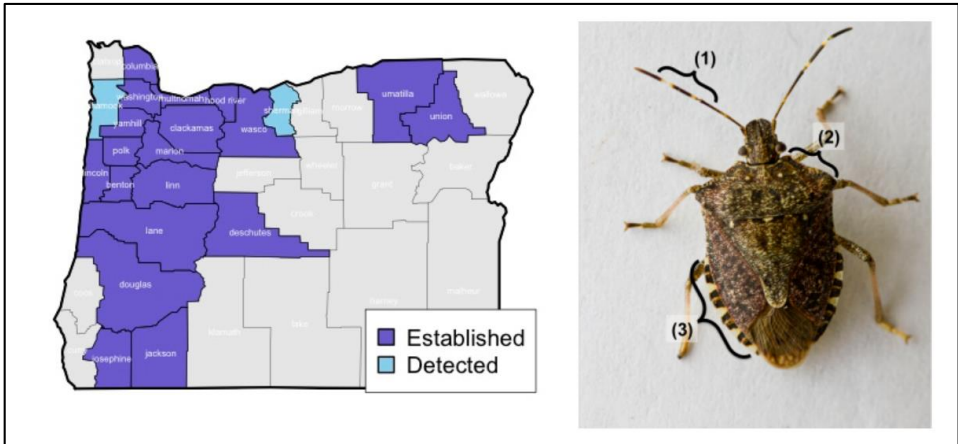


<https://www.washington.edu/news/2018/08/30/climate-change-insects-crops/>



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# Pest problems happen!



**Brown Marmorated Stink Bug**  
<http://agsci.oregonstate.edu/bmsb>

# And increasing numbers of pests...



Azalea lace bug damage Photo: Robin Rosetta, OSU

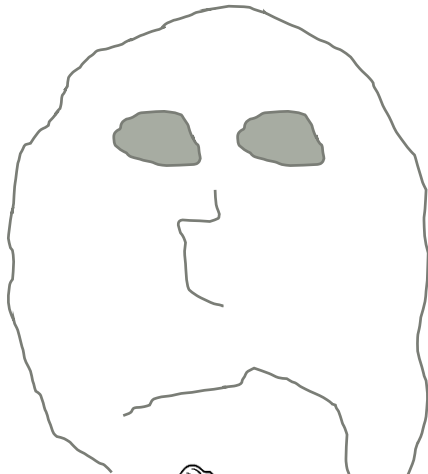


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# And increasing numbers of invasive weeds



**Lesser celandine**



[http://www.nyis.info/index.php?action=invasive\\_detail&id=71](http://www.nyis.info/index.php?action=invasive_detail&id=71)



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Climate change could alter weed proliferation and competitive behavior in weedy vegetation as well as in crop areas and maintained landscapes

Change range in terms of latitude and elevation

Change phenology



Summer  
weeds might  
become  
more  
aggressive



# What's a gardener/landscaper to do?

- **Improve soil conditions *before* planting**
- **Do your research**
- **Choose drought hardy plants**
- **Water for establishment**
- **Irrigate?**



# Improve soil compaction issues...



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# This works well...



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EC 1561. Improving garden soils with organic matter



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# Choose drought hardy plants



Courtesy Neil Bell



**A drought-tolerant plant is...**

**A plant which, after a short establishment period, will grow and flower normally without supplemental irrigation**

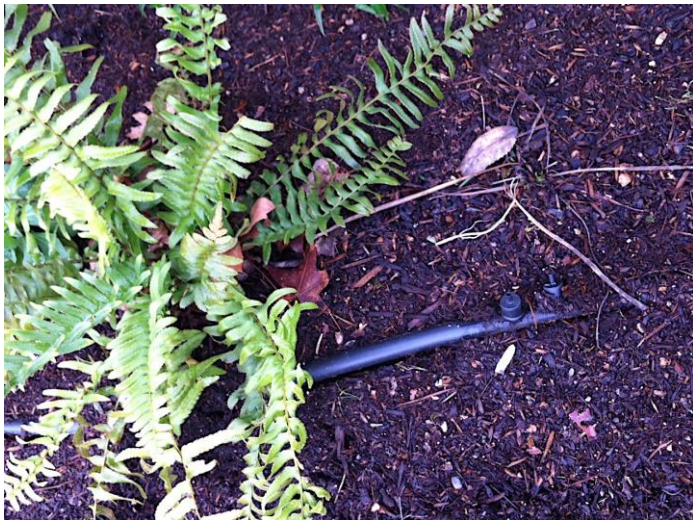


# Irrigate for plant establishment





**Temporary drips systems work well too!**





**Irrigation systems work, but  
have disadvantages**

**• Cost of installation**

**• Cost of the water, will  
the cost go up?**

**• Contribute to summer  
weed issues**

# Arborist chips and other mulches shade the soil



# Ecolawns tolerate drought better than turfgrass



Yarrow vs Ryegrass after  
5 weeks without water

Courtesy Tom Cook



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# Protect sensitive plants during cold spells



# Last and first frost dates are averages

City	Elevation	Last Frost Date (a) Less than 10% Chance	Average Last Frost Date (b) 50% Chance	Earliest Last Frost Date (c) 90% Chance
Beaverton	220 ft.	May 5	April 14	March 13
Canby	151 ft.	May 25	May 1	April 6
Forest Grove	180 ft.	May 19	April 26	April 5
Hillsboro	200 ft.	May 10	April 26	March 27
Newberg	489 ft.	April 28	April 6	February 24
Oregon City	171 ft.	April 27	April 3	February 26
Portland-Airport	0 ft.	April 21	March 28	February 29
Portland-Downtown	159 ft.	March 13	February 24	January 15
Troutdale	29 ft.	April 23	March 28	March 10
Wilsonville	151 ft.	May 8	April 18	March 20

City	Elevation	First Frost Date (d) Less than 10% Chance	Average First Frost Date (e) 50% Chance	Latest First Frost Date (f) 90% Chance
Beaverton	220 ft.	October 11	November 2	November 30
Canby	151 ft.	October 2	October 30	November 22
Forest Grove	180 ft.	September 29	October 19	November 8
Hillsboro	200 ft.	October 1	October 23	November 18
Newberg	489 ft.	October 18	November 20	December 15
Oregon City	171 ft.	October 19	November 6	December 1
Portland-Airport	0 ft.	October 26	November 6	December 3
Portland-Downtown	159 ft.	November 2	November 27	December 22
Troutdale	29 ft.	October 7	November 8	December 4
Wilsonville	151 ft.	October 8	October 30	November 24

Data source: Oregon Climate Service at Oregon State University (OCS)



# Season extension

**Protection  
from weather**

**Protection  
from pests**



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# Protects from flea beetles...



Image: <http://www.hort.purdue.edu/rhodcv/hort410/8001.jpg>



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# Carrot Rust Fly...



# Cabbage moths...



# But not the slugs!



# What's a Master Gardener to do?

## **New policy from Gail Langellotto about plant sales:**

Horticultural trade, including plant sales and plant swaps, have repeatedly been identified as an area of concern for the introduction and spread of invasive plants.

- Only sell plants that are free from pests
- Only sell plants that are properly identified, cross-checked against state and local noxious weed lists, and tagged.



# Please don't move soil around town

**Japanese beetle**

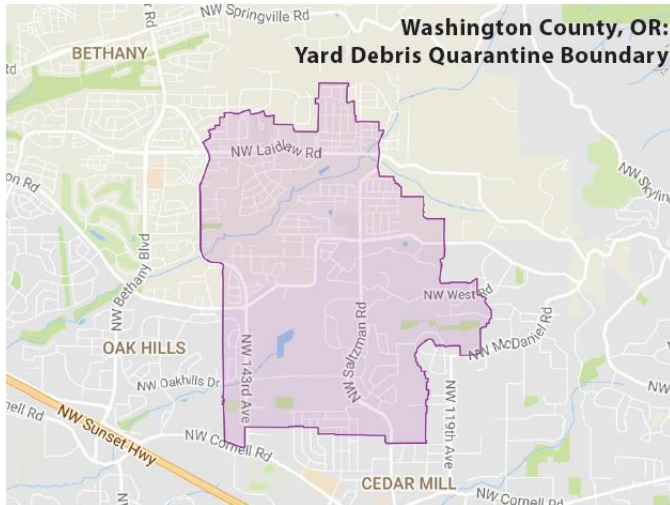


**Crazy snake worm**



# Japanese Beetles in Oregon

## Landscape debris quarantine area



# New, common problem

## **Conifers – especially Doug-firs – are suffering from drought**

August 31, 2018



<https://today.oregonstate.edu/news/conifers-%E2%80%93-especially-doug-firs-%E2%80%93-are-suffering-drought>

# Western red cedar too...





# Researcher identifies new weapons against slugs

By MATEUSZ PERKOWSKI Capital Press Dec 11, 2018



New weapons are being discovered in the battle against slugs.

Courtesy of Robin Rosetta/OSU

**Coming soon: Essential oils from thyme and spearmint are proving lethal to crop-damaging slugs without the toxicity to humans, animals or the environment that chemical solutions can present.**



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# Solve Pest Problems

## Animals

### House mouse



The **house mouse (*Mus musculus*)** causes damage to structures and supplies with its chewing. Mice contaminate food stores and household supplies with their droppings and urine.

**\*\*Health risk\*\***

Do not tolerate mice in your home or belongings.

## Insect

### Japanese beetles



The **Japanese beetle (*Popillia japonica*)** is a serious invasive insect pest that threatens Oregon. Japanese beetle adults feed on foliage and flowers of numerous plants and cause serious damage. The larvae (or grubs) attack roots of turf grass and plants too.

**\*\*Invasive insect alert!\*\***

Report sightings of Japanese beetle to Oregon Department of Agriculture.

## Diseases

### Rose black spot



**Black spot (*Diplocarpon rosae*)** produces black spots that appear on the upper surface of infested leaves.

When infection is severe, large numbers of spots may form, eventually merging to cover much of the leaf surface.

Infested plants often drop leaves during the summer.

## Weed

### Japanese and giant knotweeds



**Japanese and giant knotweeds (*Fallopia japonica*, *F. sachalinensis*)** can grow in large clumps and spread by roots. They thrive in a variety of habitats. Knotweeds take over existing plants and cause damage to rivers and streams.

**\*\*Invasive plant alert\*\***

Knotweeds are difficult to control and will require a multi-year approach.

Don't let knotweeds become established.




**Forward thinking:  
if we know that  
pests are going to  
get worse, provide  
information to help  
people make  
reasonable choices**

Solve Pest Problems

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### Japanese beetles



**1. Is this the pest?**

Japanese beetles have a distinct metallic blue body. The bronze hair shield behind the six shiny legs with dark spines. Japanese beetles have one generation per year.

**2. What damage can it do?**

The Japanese beetle feeds on grass, forams, alfalfa, field crops, landscape and garden plants. Adults concentrate feeding on leaves of trees, garden, lawn and ornamental plants. Both adults and grubs cause significant damage to the leaves of 250 or more of our most important crops. In the United States, they can cause \$1 billion in damage each year.

**3. How can you solve the problem?**

Use traps to look for Japanese beetles. Check your landscape and garden plants regularly. If you see adult beetles feed just small populations and use pest control products (chemical control) or organic, non-toxic, botanical, long-term products (biological control) that kill Japanese beetle grubs.

**4. Did it work?**

Look for graying of grass blades and adult beetles. Trap with force can be used to monitor for Japanese beetles.

**5. Prevent it from coming back**

If you are planting new plants for a landscape, choose ones that are more resistant to damage from Japanese beetles. Avoid plants that are a preferred food source. Consider gardening and landscaping practices that minimize the risk of spreading Japanese beetles.

**For more information**

**References**

- Japanese Beetles in Oregon - OSU Extension Service Publication EM802
- Japanese Beetles. S. 037 - Colorado State University Extension
- Agribio sample: <https://www.aphis.usda.gov/pests-diseases/healthcare/pests/2016/08/01/japanese-beetle>

**Thank you**

Content provided courtesy of Kent Solters and Chris Helms, Oregon Department of Agriculture

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#### Rogation information

**Japanese beetle pest!** Report insects spotted to Oregon Dept. Agriculture. Invasive Species Online Hotline: 1-800-451-5017 or visit [www.oregon.gov/ODA](http://www.oregon.gov/ODA) for more info.

**Japanese beetles are not established in Oregon**

They were detected in the Bentley area of Washington County and the Balfour area of Lane County. The Oregon Department of Agriculture has responded with measures to control its spread.

Oregon has extensive habitat suitable for Japanese beetle settlement and reproduction. There is a high risk of damage to landscapes, nurseries, and agriculture from this invasive species.


The Oregon Department of Agriculture has successfully eradicated several recent Japanese beetle infestations in Western Oregon. New infestations are subject to strict quarantines on agricultural and horticultural products to prevent further spread of the pest.

**If you think you have Japanese Beetles in Oregon**

- Report insects you suspect could be Japanese beetles to the Oregon Invasive Species Center.
- Report any extensive beetle damage to trees, vines, grapes, fruits, or other uses and discuss it to the Invasive Species Center.
- Oregon and with Oregon Department of Agriculture staff will determine if you require permission to place traps on your property during the summer.
- Consult with quarantine regulations that prohibit the movement of plants and soil from infested areas to ensure the Japanese beetle is not being transported to new agricultural fields to be free of Japanese beetles or that beetles are not moved to establish any new life stages.

**Washington County, Oregon**

Washington County, Oregon Area for Beetle Quarantine, Oregon for 2016. <http://www.oregon.gov/ODA/pests-diseases/2016-2017-beetle-quarantine>



**OSU Japanese Beetle Field Detects Quarantine Fly (2016)**

Japanese Beetle Field Detects Quarantine Fly (2016).

**OSU Alerts de Cuarentena para escarabajo japonés (2016)**

Alertas de Cuarentena para escarabajo japonés (2016).

**If you have questions, or would like to report a sighting of Japanese beetle, contact:**

Oregon Department of Agriculture  
Invasive Species Management Program  
455 Capitol S. NE  
Salem, OR 97331  
503.986.4800 or 1.800.451.5017  
[www.oregon.gov/ODA/PDF/0999](http://www.oregon.gov/ODA/PDF/0999)

For questions or health concerns about pesticides used by OSU in our invasive Japanese beetle, visit [osulife.oregon.gov](http://osulife.oregon.gov)

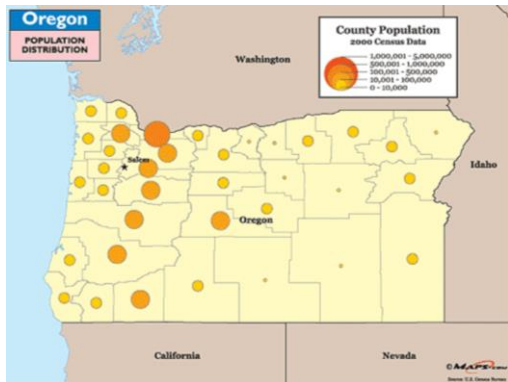
# Project purpose

**The purpose of Solve Pest Problems is to reduce the impacts of pests and pest management practices on people and the environment in non-agricultural settings. The resource will be built in English and Spanish and will address inequities in access to unbiased, science-based pest management information.**



# Intended audience

- **DYI Urban and rural residents**
- **Public and private landscape professionals**
- **Retail nursery workers**
- **OSU Master Gardener, Naturalist, and Beekeeper volunteers**
- **Communities historically underserved by OSU's IPM resources**
- **Anyone in Western US looking for pest management info**



# Audience groups



Super  
users

General  
public



# Broad coalition of support!



CLATSOP  
SWCD



TSWCD



WEST MULTNOMAH  
Soil & Water Conservation District



Metro



Oregon  
Department  
of Agriculture



House of Representatives



NORTHWEST CENTER FOR  
ALTERNATIVES TO PESTICIDES



Commission on Hispanic Affairs



# Oregon Invasive Species Council connection

- I. Prevention
- II. Early Detection & Rapid Response
- III. Control & Management
- IV. Education & Outreach
- V. Coordination & Leadership

Highlight invasives in website footer

- Anticipate 100,000+ users per year with both lay and pro audiences
- Key resource for OSU volunteers

- Starting from scratch!; now is the time to weigh-in
- Referral to state and local agencies
- Michelle Delepine- advisory



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# Please contact us:

**SolvePestProblems.edu**

**Weston Miller, program manager**

**[Weston.miller@oregonstate.edu](mailto:Weston.miller@oregonstate.edu)**

**503-706-9193**

