Welcome!

Jim Johnson
Acting Dean || Program Leader
Forestry & Natural Resources Extension
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 7:30am       | Conference Registration  
Breakfast available                                                 |
| 8:30-10:30am | Opening Plenary  
*Welcome with Tom Miles, Conference Chair and Jim Johnson, College of Forestry* |
| 8:45-9:20am  | Keynote Speaker: Jen Kucera, USDA Natural Resources Conservation Service  
*Soil Health: Opportunities and Challenges*                          |
| 9:20-9:30    | Plenary Table Discussion Instructions  
*with David Smith*                                                    |
| 9:45-10:20am | Keynote Speaker: Jim Amonette, Pacific Northwest National Laboratory  
*Potential Use of Biochar to Drawdown Atmospheric Carbon: A Preliminary Assessment for Washington State* |
| 10:20-10:30am| Table Discussion                                                        |
| 11am-4:30pm  | Concurrent Sessions: See the schedule on page 5 for Tuesday’s sessions |
| 12:15-1pm    | LUNCH Plenary Presentation: Alberta Biochar Initiative and Introduction to the North American Biochar Working Group Presented by Don Harfield, Alberta Innovates |
| 4:30-6pm     | Cascade Ballroom  
*Poster Session*                                                        |
| 6-8pm        | BBQ Dinner  
*Tickets in Back of Name Tag*                                           |

**WEDNESDAY, AUGUST 24TH**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 7:30am       | Conference Registration  
Breakfast available                                                 |
| 8:30am-10am  | Plenary: Group Discussion Report and Panel Discussion  
*with David Smith, Oregon State University*                          |
| Panel:       | *Jim Amonette, Pacific NW National Laboratory, Marcus Kauffman, OR Department of Forestry, Jen Kucera, Natural Resources Conservation Service, John Miedema, Biological Carbon, LLC, and Tom Miles, TR Miles Technical Consultants* |
| 10:30am-4:45pm| Concurrent Sessions continued: See the schedule on page 6 for Wednesday’s sessions |
| 4:50-5:15pm  | Ending Plenary – Biochar Book Raffle (blue tickets!)                  |

**THURSDAY, AUGUST 25TH**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 9am-1pm      | Morning Biochar Field Day  
*From Production to Practice*  
Meet at the Alumni Center at 8:45am |
| 10am-2pm     | Burn Boss Demonstration  
*CANCELLED!*                                                        |
| Noon-4pm     | Afternoon Biochar Field Day  
*From Production to Practice*                                         |
Schedule Announcements

• **Tuesday Night BBQ**, there will be a ticket or tickets in the back of your name tag. *If you do not have a ticket in your nametag but would like to attend, please see someone at the registration desk- there may be tickets available.*

• **Wednesday 4:20 PM** 3.6.4 Policy and Production, Trysting Tree Room
  
  **Alan Propp, Syntech Bioenergy**

  Commercial biopower system for high value biochar production

• **Raffle** at the closing plenary and for taking the post-conference survey

  **Biochar: Production, Characterization, and Applications**, CRC Press

  Sophie Minori Uchimiya

  1 -- Raffle Ticket at Closing Plenary. Must be Present to Win!

  1 – Post-Conference Survey
Biochar 2016 Participants by Sector

- **Fundamental, Applied, Extension, Dissemination**
  - 82 RESEARCH/EDUCATION (28%)
- **Biochars, Media with Biochar, Energy, Co-Products**
  - 60 BIOCHAR PRODUCERS (21%)
- **User-Producers, Systems, Equipment**
  - 34 TECHNOLOGY SUPPLIERS (12%)
- **Policy - Energy, Economics, Climate, Environment, and Resource Management**
  - 25 POLICY (9%)
- **Forest, Ag, Food, Landscape, Urban Waste, Stormwater, Organic Recycling, Retail**
  - 80 RESOURCES, INDUSTRY, MARKETS (28%)
- **OTHER**
  - 2%
Biochar Producers Attending

Sponsor*

Algae Aqua, MT
A Meliora, CA
Aqueous Solutions, NC
Biochar Farms, OR
Biochar Now, CO
Biochar Options, WI
Biochar Solutions, CO*
Biochar Supreme, WA
Biological Solutions, OR*
Biospecific LLC, WI*
Blue Sky Biochar, CA
Cascade Carbon LLC, CA
Charborn, CA
Clean Forest Energy, CO*
Confluence Energy, CO*
Cool Planet, CO
Emergent Waste Solutions, BC
Energy Anew, CA
Finger Lakes Biochar, NY
Forest Energy Group, OR
Freer Organics, ID
Integrated Biomass Resources, OR
Karr Group, WA*
Miller Soils, LLC, ID*
Natural Plant Solutions, WA
New England Biochar, MA
Nextchar, LLC, MA*
Olympic Biochar, WA
Pacific Biochar, HI*
Permamatrix, OR*
Phoenix Energy, CA
Rainforest Capital, MX
Rexius Forest ByProducts, OR*
Seachar, WA/Costa Rica
Sierra Pacific Industries, CA
Simon Landscape, WI
Smart Terra Care LLC, KS
Terra Char, MO*
Titan Carbon Smart Technologies, SK, Canada
Umpqua Biochar Alternatives, OR
Wakefield Agricultural Carbon, MO
Wallowa Resources, OR
Waste to Energy Inc, GA
Western Excelsior Corporation, CO
Wilson Biochar, OR*
Wind River Biomass LLC, WA
Zero Waste Vashon, WA
<table>
<thead>
<tr>
<th>Technology and System Suppliers Attending</th>
<th>Sponsor*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Energy Solutions, WA</td>
<td>Karr Group, WA*</td>
</tr>
<tr>
<td>Algae Aqua-Culture Technology, MT</td>
<td>LEI Products, KY</td>
</tr>
<tr>
<td>Amaron Energy, LLC</td>
<td>Living Soil Abundant Life, WA</td>
</tr>
<tr>
<td>BC Biochar, BC, Canada</td>
<td>New Carbon, South Africa</td>
</tr>
<tr>
<td>BioEnergy Development, CA</td>
<td>New England Biochar, MA</td>
</tr>
<tr>
<td>BioforceTech, CA</td>
<td>Norris Thermal Technologies/Biogreen, IN*</td>
</tr>
<tr>
<td>Biomass Controls, CT</td>
<td>PHG Energy</td>
</tr>
<tr>
<td>Cascade Carbon, CA</td>
<td>R&amp;R Technologies, CA</td>
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<tr>
<td>Dr TLUD, IL*</td>
<td>TSI Inc, WA</td>
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<tr>
<td>Enginuity Worldwide LLC, MO</td>
<td>V-GRID, CA</td>
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<tr>
<td>Exterra LLC, OH</td>
<td>Vorsana, OR</td>
</tr>
<tr>
<td>ICM Inc, KS*</td>
<td>Wilson Biochar Associates, OR</td>
</tr>
<tr>
<td>Innovative Reduction Strategies, AB, Canada</td>
<td></td>
</tr>
</tbody>
</table>
Research and Education Organizations Attending

Sponsor*

Alberta Innovates, AB, Canada
Aqueous Solutions, NC
Biochar Books, Australia
Carbon in the Soil, BC, Canada
Center for Carbon Removal, CA
Colorado School of Mines, CO
Colorado State University, CO
Gonzaga University, WA
Humboldt University, CA
Instituto Nacional de Investigaciones Forestales, Mexico
Iowa State University, IA*
Ithaka Institute, NY
Kansas State University, KS
King Saud University, Saudi Arabia
Laurentian University, ON, Canada
Lincoln University, MO
Marquette University, WI
Michigan State University, MI
Montana State University, MT
New Mexico State University, NM
Oregon State University, OR*
Pacific Northwest National Laboratory, WA
Portland State University, OR
Rice University, TX
Schatz Energy Research Center, CA
Southern Illinois University, IL
The Biochar Journal, NY
The Urban Farmer, BC, Canada
Université Laval, QC, Canada
University of Alaska, AK
University of Arid Agriculture, Pakistan
University of California, Berkeley, CA
University of California, Merced, CA
University of California, Riverside, CA
University of Colorado, Boulder, CO
University of Dayton, OH
University of Delaware, DE
University of Georgia, GA
University of Hawaii Manoa, HI
University of Massachusetts, Amherst, MA
University of Massachusetts, Boston, MA
University of Minnesota, MN
University of Technology, Sydney, Australia
University of Toronto, ON, Canada
University of Ulsan, South Korea
University of Washington, WA
University of Wisconsin, WI
USDA Agricultural Research Service, ID, IL, LA, MN, OR, SC,
USDA Natural Resources Conservation Service, OR
US Environmental Protection Agency, OR
Utah Agricultural Experiment Station, UT
Utah State University Extension, UT
Washington State University, WA
Alberta Innovates, AB, **Canada**

Biotecnologia Mexicana Contra el Cambio Climatico, **Mexico**

California Department of Agriculture, CA

City of Minneapolis, MN

International Biochar Initiative

Metro, Portland, OR

Nebraska Forest Service, NE

Oregon BEST, OR

Oregon Department of Forestry, OR*

Sonoma Biochar Initiative/Sonoma Ecology Center, CA

South Fork John Day Watershed Council, OR

South Umpqua Rural Community Partnership, OR

Sustainable Northwest, OR

US Biochar Initiative

US Environmental Protection Agency

USDA Forest Service, AK, CA, OR

USFS Umatilla National Forest, OR

Washington Department of Commerce, WA

Washington Department of Ecology, WA

Washington Department of Natural Resources, WA

Westbrook Associates, WA
Thank You!

Gold Sponsor

Alberta Innovates Technology Futures

Iowa State University

Cenusa Bioenergy

ALL Power Labs

Silver Sponsors

Boost BioChar

KARR Eco-Friendly Solutions

Terra Char

Bronze Sponsors

Biochar Solutions

Biological Solutions

Juntos Energy Solutions

Forest Concepts

Pacific Biochar

Biogreen

TSI

The Biochar 2016 planning committee would like to express their sincerest thanks for the support of our sponsors!
Thank You Workshop Instructors and Exhibitors!

Mike Flynn
BioSpecifics LLC

David Yarrow
Soil and Carbon Consultant

The planning Biochar 2016 planning committee would like to express their sincerest thanks for the support of our sponsors!
Biochar 2016 Planning Committee

Tom Miles, Conference Chair
TR Miles Technical Consultants

Brianna Beene
Oregon State University

Matt Delaney
Delaney Forestry Services

Myles Gray
Geosyntec Consultants

Sarah Burch
Oregon State University

Marcus Kauffman
Oregon Department of Forestry

John Miedema
Biological Solutions

David Smith
Oregon State University

Kristin Trippe
USDA Agricultural Research Service
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Albert Bates, Global Village Institute, TN

John Bonitz, Celebrity Goat Dairy, NC

Kathleen Draper, Finger Lakes Biochar, NY

Ron Larson, Larson Consulting, CO

Jonah Levine, Biochar Solutions, CO

Tom Miles, Conference Chair, TR Miles Technical Consultants, OR

Kelpie Wilson, Wilson Biochar Associates, OR
Soil Health: Opportunities and Challenges

Jen Kucera
USDA Natural Resources Conservation Service
PLENARY QUESTIONS

Time for audience participation
BIOCHAR WANTS TO KNOW YOUR OPINION!
Q1: Biochar has proven to improve soil health in many ways. How important are each one of these benefits for expanding biochar markets?

Directions: This is the number of votes to record for each part of the question. Tally the votes, multiply by the ranking (1-5), then add-up and enter total points for each part.

Number of people at the table: **6**

<table>
<thead>
<tr>
<th>Importance ranking</th>
<th>No important Votes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very important Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water/nutrient retention</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2x3 +3x1 +5x2 = 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH adjustment (liming)</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1x3 +3x1 +4x2 = 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilth, soil structure improvement</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2x2 +4x3 +5x1 = 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop productivity improvement</td>
<td>6</td>
<td>6x5 = 30</td>
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<td></td>
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<td></td>
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<tr>
<td>Soil carbon addition</td>
<td>5</td>
<td>1</td>
<td>4x5 +5x1 = 25</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Q1: Biochar has proven to improve soil health in many ways. How important are each one of these benefits for expanding biochar markets?

Directions: This is the number of votes to record for each part of the question. Tally the votes, multiply by the ranking (1-5), then add-up and enter total points for each part.

Number of people at the table: ______________

<table>
<thead>
<tr>
<th>Importance ranking, Not important Votes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total points</th>
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</thead>
<tbody>
<tr>
<td>Water/nutrient retention</td>
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<tr>
<td>pH adjustment (liming)</td>
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<tr>
<td>Tilth, soil structure improvement</td>
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<tr>
<td>Crop productivity improvement</td>
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<tr>
<td>Soil carbon addition</td>
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</tbody>
</table>
# Q2: How can we help propel the biochar industry forward? What do we need more of?

**Directions:** This is the number of votes to record for each part of the question. Tally the votes, multiply by the ranking (1-5), then add-up and enter total points for each part.

Number of people at the table: ______________

<table>
<thead>
<tr>
<th>Importance ranking, Do Not Need More Votes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Need More Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical application information</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Increased supply</td>
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<tr>
<td>Better production technology</td>
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<tr>
<td>Lower prices</td>
<td></td>
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<tr>
<td>Technical grade specifications and test methods</td>
<td></td>
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<tr>
<td>Policy support and incentives</td>
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</tbody>
</table>
Potential Use of Biochar to Drawdown Atmospheric Carbon: A Preliminary Assessment for Washington State

Jim Amonette
Pacific Northwest National Laboratory
**Q3: Public and industry acceptance of biochar (and ultimately growth of the industry) are best achieved by promoting its attributes and benefits to society. Which are the most important to promote?**

**Directions:** This is the number of votes to record for each part of the question. Tally the votes, multiply by the ranking (1-5), then add-up and enter total points for each part.

<table>
<thead>
<tr>
<th>Importance ranking, Not important Votes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very important Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation of climate change</td>
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<tr>
<td>Rural economic development</td>
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<tr>
<td>Agricultural soil productivity and water efficiency</td>
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<tr>
<td>Recycling/reuse of biomass</td>
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<tr>
<td>Pollution mitigation/reclamation</td>
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</tbody>
</table>

Number of people at the table: ______________
Q4: Biochar is a growing industry, but how will it grow? In 10 years, how important will each of these producer-types be to the industry’s success?

Directions: This is the number of votes to record for each part of the question. Tally the votes, multiply by the ranking (1-5), then add-up and enter total points for each part.

<table>
<thead>
<tr>
<th>Importance ranking, Votes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very important Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boutique producers, producing a few hundred tons per year.</td>
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<tr>
<td>Medium producers, making a couple thousand tons per year, focused on selling locally.</td>
<td></td>
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</tr>
<tr>
<td>Large producers, making tens of thousands of tons per year to tight quality specs and selling technical grades to large, special markets.</td>
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</tr>
<tr>
<td>Biomass-fueled boilers retrofitted to produce both energy and generic biochar to general specifications for broad markets.</td>
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Number of people at the table: ___________________