The OutREACCH
A quarterly report by Regional Approaches to Climate Change
Pacific Northwest Agriculture

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www.reacchpna.org

Director's Corner:

Getting the Word Out to Agribusiness

Sanford Eigenbrode, Project Director, UI

The Far West Agribusiness Association held its December 2013 Winter Conference on Dec. 9-11 in Pasco, Washington. Several REACCH scientists and students were in attendance to learn about the mission and concerns of the Association, build relationships with these stakeholders and make presentations about our work in the REACCH PNA project. The opportunity was ideal as we move into Phase II of REACCH, which will include a much greater emphasis on outreach, communicating our science and working to make sure it is relevant by considering feedback from all sectors of our stakeholder audience. The ten presentations by REACCH members were: *Precision Management to Increase N Use Efficiency in Dryland Wheat* (Dave Huggins), *An Economic Forecasting Tool to Measure the Profitability of an Investment* (Clark Seavert), *Cropping System Intensification and Diversification in PNW Dryland Cropping Systems* (Bill Pan and Tai Maaz), *Cereal Aphids and Changing Climates in the Northwest* (Sanford Eigenbrode), *The Use of Different Satellite Sensors for Assessing Crop Performance* (Troy Magney), *What Do We Currently Know About the Impacts of Climate Change on PNW Cropland Agriculture?* (Chad Kruger), *Soil Carbon Sequestration in Dryland Wheat-Based Cropping Systems* (Dave Huggins), *The Cereal Leaf Beetle and Changing Climates in the Northwest* (Sanford Eigenbrode, John Abatzoglou and Nate Foote), *Transitioning from Traditional Fallow to Chemical Fallow with the Stripper Head* (Frank Young and Lauren Young). Our presentations included several with immediate relevance to producers and agricultural professionals and others addressing longer-term issues pertaining to climate change and its impacts for agriculture to mid century and beyond. All were well attended and well received, helping enormously to educate stakeholders about what REACCH is and what we are doing. The interactions with other participants and opportunities to learn were invaluable. We are very grateful to Jim Fitzgerald, Executive Director at Far West Agribusiness Association, his planning committee and staff, especially Tara Smith, for encouraging our team to contribute to the conference and for organizing the event.
Look for more REACCH-related presentations this winter at meetings including the Idaho Cereal Schools, the Far West Agribusiness Association January Winter Conference, January 6-8 at the College of Southern Idaho in Twin Falls, ID, posters at Oilseed/Direct Seed conference January 21, 2014 at the Three Rivers Convention Center in Kennewick, Washington.

Extension on the Move: Upcoming Projects and Opportunities

Kristy Borrelli, UI

As winter settles in and 2013 draws to a close, REACCH is already preparing for next year. Our Annual Conference is in March and we are going to make it a good one! Our annual report will be available then in a new magazine-style format and will help guide conversations and activities at the conference. Everyone is welcome to attend for any length of time, but Wednesday March 5 has been designated "Stakeholder Day" and the day's events will be targeted towards addressing the interests and needs of our stakeholders, with many opportunities to interact with REACCH scientists, students and advisory committee members. Applications for REACCH Extension mini-grant projects are due December 15, 2013 for early 2014 awards. If you can't meet the December deadline, or have that great idea a little too late, applications can be submitted again in April and August. These projects assist development of important extension resources, so please help us to encourage people to apply. The RFP and examples of previously funded projects can be accessed at: https://www.reacchpna.org/mission/extension/. We are continuing to improve our communication abilities and interactions with our stakeholders. You will see and hear more about new resources and opportunities to be involved with REACCH after the New Year. Have a wonderful holiday season and we hope to see you all in March!

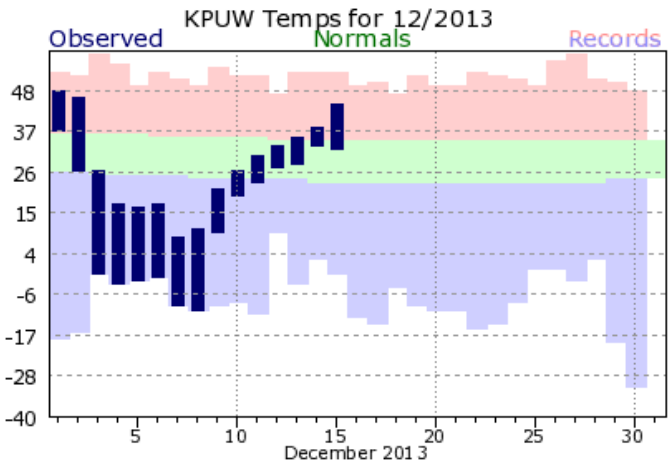
Cold Start to December

John Abatzoglou, UI

We are finally thawing from a strong early winter cold air outbreak. Temperatures in the 30s never felt so warm, right?

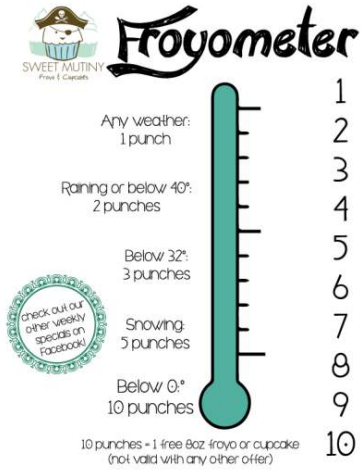
The perfect setup for a cold air outbreak includes: (a) North to Northeasterly flow that directs Arctic/Continental Polar air that has been "chilling" over the frigid northern continent into the NW, (b) a white carpet rolled out ahead of the cold air outbreak from a land alling winter cyclone that drops snow across the area and minimizes the amount of modification the Arctic air undergoes when migrating south, and (c) strong surface high pressure that allows for calm conditions and extremely low levels of atmospheric moisture. It further helps to have these conditions "locked in" for some time for a cumulative effect on low temperatures.

Much of the inland NW received measurable snowfall between December 3-5 during the transition between our typical maritime zonal pattern and the Arctic meridional pattern. Locations that avoided any appreciable snow got off the hook easier than their counterparts. One of the local cold spot in Northern Idaho and eastern Washington that did receive a couple of inches of snow was the Pullman airport which recorded 6 consecutive nights below 0F. This is the longest streak of minimum temperatures of sub-0 temperatures since the ASOS station began in 1998. This was not the case for longer-term stations in the area as colder events in early December occurred in 1972, 1922, and 1919. In addition to the ideal synoptic setup for cold temperatures mentioned earlier, the topography in the immediate vicinity of the airport allowed for air that is rapidly cooled at night (especially w/snow cover which is an effective emitter of radiation) to drain into the valley where the airport sits.



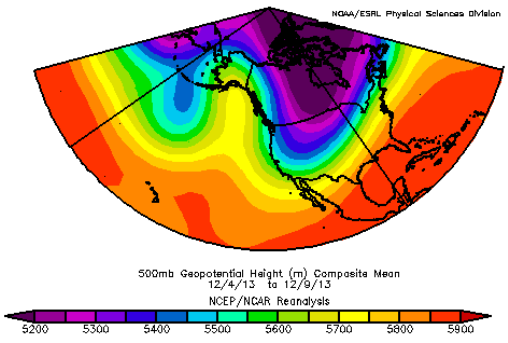
The inland NW was is good shivering company as this cold air outbreak brought wickedly cold temperature to much of the contiguous US and associated hazards of snow, ice and power outages. While much news coverage across the country focused on the cold, Alaska was toasty (relatively). In fact, freezing rain was reported in Anchorage and Fairbanks as air temperatures near 5000-feet elevation were above freezing. The daily average temperature from December 4-8 was 7F, 7F, 8F, 0F, 0F at the Pullman Airport, while average temperature on these same days in Barrow Alaska was 15F, 9F, 18F, 24F and 23F (w/o an appearance from the sun at 71.3N). Yes, sometimes life is not fair.

A local cupcake and frozen-yogurt shop called Sweet Mutiny in Pullman provides a humorous incentive to increase business during such cold times. See it pays to watch the weather.



This harkens back to one of my favorite computer games as a kid on the Apple II called Lemonade Stand where you'd base your decisions on how many glasses of lemonade and their price as a function of the daily weather forecast (e.g., hot you sell a lot, cold and wet not so much). Promotions like the one by Sweet Mutiny this would have been a real wildcard in that game.

Don't let the cold weather and snow cover fool you though. The cold air coincides with a typically very wet time of the year across the Pacific NW. This cold-dry regime has further contributed to the snowpack deficit where it really matters in our mountains. While snowpack in the Idaho Panhandle, western Montana and the Yellowstone area is on par, the Cascades and Boise Front Range are lagging.

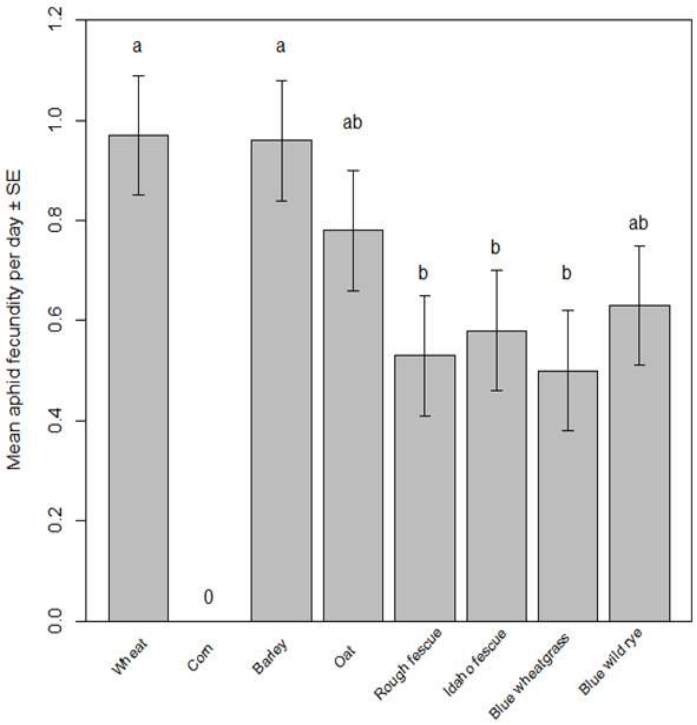


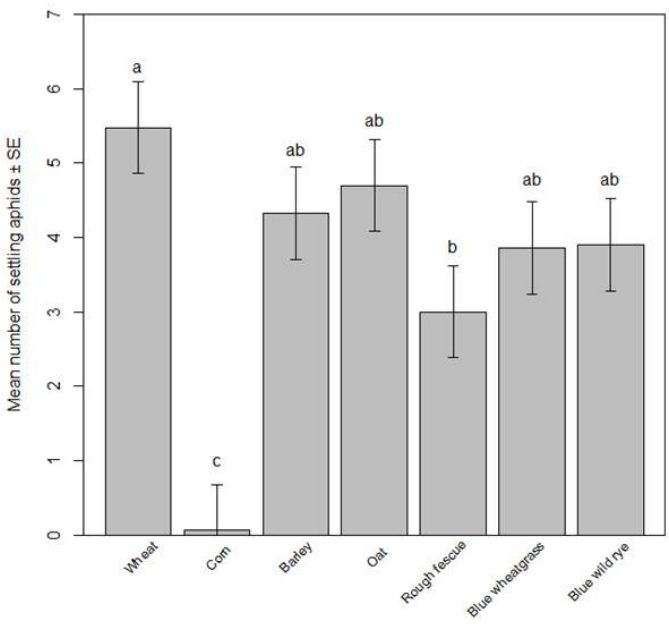
New Insights into a New Aphid Species, Data on *Metopolophium festucae cerealium*

Seth Davis, UI

The cereal aphid *Metopolophium festucae cerealium* (Stroyan) is a recent addition to North America, but little is known about this species in its exotic habitat. We surveyed aphid populations for three years (2011-2013) to investigate changes in aphid density in the Pacific Northwest U.S.A. We tested aphid host settling preference and fecundity on eight grass species: four native grasses (Blue wheatgrass, Blue wild rye, Idaho fescue, and rough fescue) and four cereal crops (corn, wheat, barley, and oat). We also evaluated the effects of aphid feeding on plant biomass in no-choice assays.

Four important findings emerged: (1) aphid prevalence in sweep net samples increased 331% on average from 2011-2013; (2) aphids preferentially settled on wheat and avoided corn, but aphids did not discriminate between barley, oat, and native grasses; (3) aphid fecundity was high on wheat and barley, intermediate on oat and Blue wild rye, low on Idaho fescue, rough fescue, and Blue wheatgrass, and aphids did not reproduce at all on corn; and (4) barley, corn, oats, Idaho fescue and Blue wild rye were tolerant of aphid feeding, but wheat, rough fescue, and Blue wheatgrass were intolerant of aphid feeding damage.





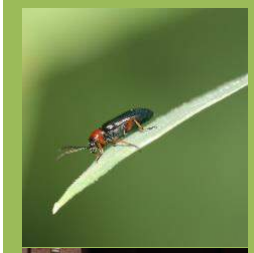
Our results suggest that wheat and barley are preferred by *M. festucae cerealium*, and that aphids reproduce most rapidly on these hosts and cause significant reductions in wheat but not barley growth. Also, *M. festucae cerealium* appears capable of surviving on native grasses, though only Blue wheatgrass and rough fescue were susceptible to aphid feeding damage.

Variable	Plant spp.	Treatment: Aphids	Treatment: Control	df	|t|	P	% biomass reduction
Above ground biomass (g)	Wheat	**3.25±0.82**	**7.35±0.59**	**10**	**4.036**	**0.002**	55.78
	Corn	**6.82±0.32**	**3.73±0.39**	**9**	**−2.356**	**0.042**	-82.84
	Barley	8.58±1.68	9.66±0.48	10	0.618	0.550	11.18
	Oat	8.85±1.73	11.10±0.93	10	1.144	0.278	20.27
	Rough fescue	**0.88±0.14**	**1.67±0.13**	**10**	**4.051**	**0.002**	47.31
	Idaho fescue	0.56±0.31	1.31±0.52	10	1.227	0.247	57.25
	Blue wheatgrass	**4.98±1.12**	**6.68±0.39**	**10**	**2.800**	**0.018**	25.45
	Blue wild rye	12.80±0.97	13.15±0.55	10	0.311	0.761	2.66
Below ground biomass (g)	Wheat	**2.40±1.00**	**7.61±2.12**	**10**	**2.213**	**0.026**	68.46
	Corn	**2.15±0.16**	**1.20±0.13**	**9**	**−4.625**	**0.001**	-79.17
	Barley	3.05±1.15	4.90±0.66	10	1.387	0.214	37.76
	Oat	2.25±0.82	3.36±0.59	10	1.093	0.300	33.04
	Rough fescue	**0.31±0.04**	**0.82±0.08**	**10**	**5.028**	**0.0005**	62.20
	Idaho fescue	0.24±0.14	0.63±0.19	10	1.635	0.133	61.90
	Blue wheatgrass	**2.60±0.53**	**4.80±0.53**	**10**	**2.934**	**0.014**	45.83
	Blue wild rye	21.03±7.22	20.45±5.28	10	−0.065	0.949	2.84

REACCH
Regional Approaches to Climate Change – PACIFIC NORTHWEST AGRICULTURE

REACCH 2014 ANNUAL MEETING

March 5-7, 2014 - Red Lion Hotel - Richland, WA



Mark your calendars and plan to attend the REACCH 2014 Annual Meeting, March 5-7, 2014 at the Red Lion Hanford House Hotel in Richland, WA.

A full-day meeting (8 a.m. - 5 p.m.) is scheduled for Wednesday, March 5 and Thursday, March 6, with a half-day meeting (8 a.m. - 12:30 p.m.) scheduled for Friday, March 7, 2014.

The meeting objectives are to:

- Celebrate our accomplishments and plan for future impacts and priorities.
- Engage productively with our stakeholders and graduate students to enhance the outcomes of the project and Extension products and activities.
- Enhance project integration now and into the future.

Highlights and Featured Activities:

- Speed Science, Poster Session, Keynote Speaker TBD, Toolbox Integration, SNA Assessment, Extension Activities, Graduate Student Highlights and Breakfast, Producer Survey Results, Evening Banquet.

Hotel and Meeting Registration

A room block has been set up at the Red Lion Hanford House Hotel. To request a room reservation please call 509-946-7611 or register online at this link.

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University of Idaho
Washington State University
Agricultural Research Service
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