BIOAG PROJECT FINAL REPORT

Title: 2013 INTERNATIONAL QUINOA RESEARCH SYMPOSIUM

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Key Personnel:

- Matthew Dillon, Seed Matters and Clif Bar Family Foundation
- James Henderson, Hummingbird Wholesale, Eugene, OR
- Tom Hunton, Hunton's Farm and Camas Country Mill, 28390 Milliron Rd., Junction City, OR 97448; tomh@camascountrymill.com
- Steve Goffena, 16005 SW Inverurie Rd., Lake Oswego, Amity, OR 97101; stevegoffena@gmail.com
- Brad Jaeckel, WSU Organic Farm Manager, Pullman, WA, 99164
- Ian Clark, Clark Farms, Albion, WA

Key words: quinoa, international year of quinoa, research symposium, quinoa breeding, quinoa variety trials, organic quinoa

Abstract:
The International Quinoa Research Symposium was held on August 12-14, 2013, at Washington State University. The symposium featured presentations from quinoa experts from around the world, and was attended by a diverse group of participants, some coming from as far away as France, Australia and Senegal. Presentations and discussions of current research, as well as demonstrations at area field trials, highlighted the biodiversity of quinoa and its potential role in global food security and alleviation of poverty. The symposium was primarily funded by the USDA's National Institute of Food and Agriculture (NIFA) through the Organic Agriculture Research and Extension Initiative (OREI). Other partners in the symposium were the United Nations' Food and Agriculture Organization, Brigham Young University, Oregon State University, Utah State University, Clif Bar Family Foundation/Seed Matters, Kellogg Company, Earthbound Farm, FAIR Spirits, and the Center for Sustaining Agriculture and Natural Resources at WSU.

Project Description

The International Quinoa Research Symposium coincided with 2013 having been declared by the United Nations Food and Agriculture Organization as the "International Year of the Quinoa." The symposium, held at the WSU-Pullman campus, was attended by 155 people, made up of 122 participants, 22 speakers, and 11 members of the organizing committee comprised of the members of Kevin Murphy's program and CAHNRS Alumni and Development staff. There were 24 countries represented, with 106 participants from the United States, 10 from Canada, eight from Bolivia, five from Australia, three from Argentina, two each from France, New Zealand, Chile and Rwanda, and one each from the United Kingdom, Denmark, Italy, Germany, Pakistan, Nepal, Peru, Morocco, Ethiopia, Senegal, Malawi, Egypt, Cameroon, Tibet (China) and Indonesia. Participants from the US came from 18 different states, including: Washington (45), California (14), Oregon (12), Colorado (8), Utah (6), Idaho (5), two each from Montana, Arizona, Pennsylvania, New Mexico, and one each from North Dakota, Michigan, Iowa, District of Columbia, Indiana, Ohio, New York and Texas.

The participants come from a wide diversity of professions - quinoa growers, most notably Bolivian farmers representing quinoa farmers' associations, along with scientists and researchers studying the genetics, breeding, agronomy, physiology and nutritional aspects of quinoa. Also among the participants were entrepreneurs and business owners wishing to learn more about quinoa varieties, quinoa production under organic and conventional farming systems, and reliable sources of quinoa seed. Agricultural economists, statisticians, farm supervisors,

representative of a Native American nation, members of think tanks, science reporters, editors and publishers also attended the symposium.

The morning sessions were devoted to presentations from quinoa scientists, plant breeders and growers. Visits to farm trials were scheduled in the afternoons. After a welcome address by WSU President **Elson Floyd**, Ms. **Tania Santivanez**, Technical Coordinator of the FAO's International Year of Quinoa, was the featured speaker for the first day. In her talk, she discussed the potential role of quinoa biodiversity in global food security, nutrition, and poverty eradication. The keynote speaker was **Dr. Sven-Erik Jacobsen**, from the University of Copenhagen, Denmark. He has been involved in quinoa research for more than 20 years, and talked about the potential of quinoa as a global crop. **John McCamant** of the White Mountain Farms, was the featured quinoa grower. He, along with farmer **Paul New**, talked about their experiences growing and breeding quinoa varieties in Colorado for the past 25 years. Two graduate students served as simultaneous translators, so that Spanish-speaking people, particularly the Bolivian farmers, could understand the talks.

Other invited speakers are world-renowned experts in their fields of expertise in quinoa studies, namely: **Dr. Didier Bazile**, scientist and researcher, from CIRAD (International Cooperation Center for Agricultural Research for Development); **Dr. Daniel Bertero**, Professor, Faculty of Agronomy, at the University of Buenos Aires (Crop Physiology) and researcher at Conicet, the Argentinian National Research Council; **Dr. Luz Gomez-Pando**, Principal Professor at the Universidad Nacional Agraria la Molina-Peru; **Dr. Juan Antonio Gonzalez**, senior scientist at the Instituto de Ecología, Fundación Miguel Lillo, Tucuman, Argentina; **Dr. Rick Jellen**, Professor and Department Chair and **Dr. Jeff Maughan**, Professor of Genetics, both from the Department of Plant and Wildlife Sciences, Brigham Young University, Provo, Utah; **Dr. Moses Maliro**, Associate Professor of Plant Breeding and Genetics, Bunda College, Lilongwe University of Agriculture and Natural Resources (LUANAR), Malawi; **Dr. Wilfredo Rojas**, Plant Genetics Resources Specialist, PROINPA (Foundation for the Promotion & Investigation of Andean Produce), Bolivia; **Frank Morton**, breeder and seed grower, Wild Garden Seed, Philomath, Oregon; and **Dr. Hassan Munir**, Assistant Professor, Department of Crop Physiology, University of Agriculture Faisalabad, Pakistan. Local speakers included **Brad Jaeckel**, WSU Organic Farm Manager; **Ian Clark**, quinoa grower from Albion, WA; **Jeremy Bunch**, Shepard's Grain, Moscow, ID; **Dr. Kevin Murphy**, and his graduate students **Hannah Walters, Morgan Gardner** and **Adam Peterson.**

The symposium presentations ranged from the potential of quinoa as a global crop to ensure food security, and quinoa breeding, physiology, genetics and genomics, to the *ex-situ* conservation of quinoa germplasm, and global experiences cultivating quinoa, both in traditional and non-traditional quinoa growing regions. Agroecological and ecophysiological studies on quinoa were also presented, along with studies on adaptability of quinoa to the growing conditions of Pakistan

and Malawi, and the social adoption of quinoa in Malawian culture and diet. Experiences in growing quinoa in Oregon and Colorado were also presented, together with poster sessions and farm tours of WSU quinoa research. On the last day of the symposium, farmers from Bolivia, representing quinoa farmer cooperatives, also gave a talk on quinoa production in Bolivia. They shared their wonder and amazement that the crop that their ancestors cultivated throughout many centuries could be used to help alleviate poverty among the poorest lands and farmers of the world. They, who have known much poverty themselves, were truly willing to share their genetic heritage, the precious resource which is quinoa germplasm, to the poor people living in marginal lands. However, they also expressed their fears that once quinoa is grown worldwide, it would also threaten the best source of income they have known. Their presentation triggered discussion on sensitive issues such as control and access to quinoa germplasm, fair trade, creating a balance between research and commerce, protecting intellectual property and granting free market access, and conserving the genetic heritage of people groups for their descendants.

Below is a list of the farms, food companies, businesses, farmer groups, government agencies, research centers and institutes, non-government organizations, universities, media and other entities represented in the symposium:

Farms:

Allan Family Farm, Pullman, WA
Gib Family Farms, Pomeroy, WA
Dharma Ridge Farm, Chimacum, WA
Bison Ranch, Portland, OR
Eola Hill Farms, Lake Oswego, OR
Stahlbush Island Farms, Corvallis, OR
Wild Garden Seed, Philomath, OR
Rimrock Ranches, Genesee, ID
Sticky Fingers Farm LLC, Troy, ID
Earthbound Farm, San Juan Bautista, CA
Lundberg Family Farms, Richvale, CA
Wild Rose Farm, Blue Lake, CA
La Bolsa Farm, Embudo, NM
White Mountain Farms, Denver, CO
Northern Quinoa, Saskatchewan, Canada
Carinya Farms, Western Australia
Australian Quinoa, Western Australia
Ascending Moon Farm, Feilding, New Zealand
Midlands Seed Ltd, New Zealand
Habasha Harvest, Ethiopia

Food and beverage companies:

Hollingbery and Son Inc, Yakima, WA
Continental Mills Inc, Tukwila, WA
Dora's Garden LLC, Union, OR
KCE Enterprises LLC, Bend, OR
Hummingbird Wholesale, Eugene, OR
Marion-Polk Food Share, Salem, OR
FAIR Spirits, Danville, CA
Alter Eco, San Francisco, CA
Amy's Kitchen, Santa Rosa, CA
Grindstone Bakery, Rohnert Park, CA
Seed Matters, Clif Bar Family Foundation, San Francisco, CA
Easy Street Enterprises, Wilsall, MT
Keen Ingredients, Denver, CO
Hart Prairie Foods, Phoenix, AZ
SK Food International, Fargo, ND
Kellogg Company, Battle Creek, MI
Flagship Factory, Vancouver, Canada
Silver Hills Bakery, Abbotsford, BC, Canada
Phillex Ltd, Manitoba, Canada
Zinda Products Canada Inc, Quebec, Canada

Farmer groups/associations

Shepherd's Grain, Moscow, ID
Jacha Inti Industrial, SA (JISA), Bolivia
Asociación de Productores y Exportadores de Quinua Real (APEQUIR), Bolivia
Asociación de Productores de Quinua Cayñi-Quillacas (APROCAY-Quillacas), Bolivia
Cámara Departamental de la Quinua Real del Departamento de Potosí (CADEQUIR), Bolivia
Asociación Ayllus Productores de Quinua y Camélidos (APQC), Bolivia
Sindan Organic SRL, Bolivia

Native American nation: Stswecemc/Xgat'tem First Nation, British Columbia, Canada

NGO: Hawassa Agriculture development, Ethiopia

Companies:

McKay Seed Company Inc, Almira, WA
AgriCare, Jefferson, OR
Andean Naturals Inc, Foster City, CA

Trinidad Benham Corporation, Denver, CO
TestAmerica, Golden, CO
Quinoa Global Trading Inc, New York, NY
Crop Development Services Limited, Essex, United Kingdom

Media and public relations:

WSU Corporate & Foundation Relations
Mud City Press, Eugene, OR
Watershed Communication, Portland, OR
Capital Press, Salem, OR
Good Food World
Nepali Manch Magazine, Kathmandu, Nepal

Universities:

Washington State University, Pullman, WA
Oregon State University, Corvallis, OR
Utah State University, Logan, UT
Brigham Young University, Provo, UT
Iowa State University, Ames, IA
Purdue University, West Lafayette, IN
Universidad Arturo Prat, Chile
University of Buenos Aires, Argentina
Universidad Nacional Agraria La Molina, Peru
University of Hohenheim, Stuttgart, Germany
École Supérieure d'Agriculture d'Angers, France
University of Copenhagen, Faculty of Science, Denmark
Bogor Agriculture University, Indonesia
Agriculture and Animal Husbandry College of Tibet, China
Ain Shams University, Cairo, Egypt
University of Agriculture, Faisalabad, Pakistan
University of Buea, Cameroon
Lilongwe University of Agriculture and Natural Resources, Malawi

Government agencies/Research Centers/Institutes:

USDA Economic Research Service, Washington, D.C.
USDA-ARS Children's Nutrition Research Center, Houston, TX
USDA-ARS Western Wheat Quality Lab, Pullman, WA
FAO-United Nations, Rome, Italy
BioTierra Biodiversity Research Center, Bolinas, CA
Food First/Institute for Food & Development Policy, Oakland, CA

Ontario Ministry of Agriculture and Food, Canada
Instituto de Ecologica-Fundacion Miguel Lillo, Argentina
Centro de Estudios Avanzados en Zonas Áridas, Chile
PROINPA Foundation, La Paz, Bolivia
Department of Agriculture and Food Western Australia
Agronomic and Veterinary Medicine Hassan II Institute, Agadir, Morocco
National Institute of Statistics Rwanda (NISR), Kigali, Rwanda
Directions des Aires Marines Communautaires Protégées (DAMCP), Dakar, Senegal

OUTPUTS

A website was set up to announce the symposium and to allow participants to register online:

https://www.etouches.com/ehome/quinoa/

Other websites have also been set-up to announcing the symposium to the public:

http://alumni.cahnrs.wsu.edu/evites/quinoa-symposium.html
https://www.facebook.com/InternationalQuinoaResearchSymposium

Other websites have also picked up the news of the symposium and made similar announcements:

http://www.rlc.fao.org/en/events/international-quinoa-research-symposium-2013/
http://21acres.org/international-quinoa-symposium-at-wsu-registration-now-open
http://lmtribune.com/raw_news/article_5e034bd7-c92f-520f-824e-efdac3d6db72.html
http://www.helpfulgardener.com/forum/viewtopic.php?f=4&t=54442
http://www.cropsforthefuture.org/2013/05/international-quinoa-research-symposium/
http://onspecialtycrops.wordpress.com/2013/08/06/international-quinoa-research-symposium-webcast-august-12-14-2013/
http://www.seedbuzz.com/news-events/events/international-quinoa-research-symposium-2013
http://article.wn.com/view/2013/06/06/Aug_1214_Registration_for_International_Quinoa_Research_Symp/#/related_news
http://www.highbeam.com/doc/1P3-2989980301.html
http://onspecialtycrops.files.wordpress.com/2013/08/iqrs-2013.pdf
http://uk.groups.yahoo.com/group/Biodiversity_for_Nutrition/message/842
http://feest.us/international-quinoa-research-symposium--pullman-wa-2013
http://farmsatwork.ca/news/interested-growing-quinoa
http://laquinua.blogspot.com/2013/07/international-quinoa-research-symposium.html
http://nutrivise.tumblr.com/post/34707731700/2013-will-be-the-international-year-of-quinoa

https://twitter.com/iheartkeenwah/status/335077729072476161

A few months before the symposium, several news articles have been written about quinoa research conducted by Kevin Murphy and his students at WSU. These news articles also included an announcement about the upcoming symposium:

The Crop Site. March 28, 2013. Quinoa Suggested as 'Grain Alternative' to Meet Food Demand. http://www.thecropsite.com/news/13330/quinoa-suggested-as-grain-alternative-to-meet-food-demand

The Rural Messenger. April 5, 2013. Research Cultivates Seeds of Opportunity. http://www.ruralmessenger.com/56820/research-cultivates-seeds-of-opportunity.html

WSU. April 15, 2013. WSU Research Cultivates Quinoa for Pacific Northwest. http://www.agprofessional.com/newsletters/agpro-weekly/articles/WSU-research-cultivates-quinoa-for-Pacific-Northwest-202697901.html

Kantor S. April 16, 2013. Quinoa Driving Demand for Domestic Sources. http://westernfarmpress.com/markets/quinoa-driving-demand-domestic-sources

Gelski J. Aug. 6, 2013. Starting New Traditions. http://www.bakingbusiness.com/articles/news_home/Trends/2013/08/Starting_new_traditions.aspx?ID={14CDF191-4F77-4633-8348-20E1A7E57BA8}&cck=1 and http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2013/08/Starting_new_traditions.aspx?ID={14CDF191-4F77-4633-8348-20E1A7E57BA8}

All the oral, indoor presentations were recorded, including the slides, and are available as webinars in eOrganic. They can be accessed using the following links:

http://www.youtube.com/playlist?list=PLZMuQJAj6rOoftNenC-Iuz3MKsc5H1C2u
http://tilth.org/events/international-quinoa-research-symposium-broadcast-webinar
http://www.extension.org/pages/68467/international-quinoa-research-symposium-broadcast-webinar#.UqTlFyeFfRU

Oregon State University audio taped the symposium and it can be heard via YouTube:

http://www.extension.org/pages/68467/international-quinoa-research-symposium-broadcast-webinar

Several news articles have also been written about the symposium:

Charles D. Aug. 15, 2013. Can Quinoa Farming Go Global Without Leaving Andeans Behind? http://www.npr.org/blogs/thesalt/2013/08/15/212342707/can-quinoa-farming-go-global-without-leaving-andeans-behind

Greene T. Aug. 16, 2013. Quinoa: A Plant with a Lot of Potential. http://blogs.usda.gov/2013/08/16/quinoa-a-plant-with-a-lot-of-potential/ and http://www.acreagelife.com/country-news/quinoa-plant-lot-potential

The editors. Aug. 17, 2013. Quinoa Production Goes Global. http://theglobalfool.com/quinoa-production-goes-global/

Interview of Simcox J with Hannah Walters, posted on Aug. 20, 2013 http://www.youtube.com/watch?v=UfNc0u5BmAA; and http://www.frequency.com/video/joseph-simcox-interviews-hannah-walters/114105850/-/5-1953

Kailing G. Aug. 26 & 27, 2013. Good Food World. Quinoa: The Passion and the Politics. http://www.goodfoodworld.com/2013/08/quinoa-the-passion-and-the-politics/ and http://archive.constantcontact.com/fs158/1101657252156/archive/1114195769515.html

Easterling C. Sept. 7, 2013. Wilsall Farmers Take a Shot at Growing Quinoa. http://billingsgazette.com/news/state-and-regional/montana/wilsall-farmers-take-a-shot-at-growing-quinoa/article_cb323e21-928a-51d2-a5dc-1ca867c2aaae.html

Armstrong D. Sept. 25, 2013. The International Year of Quinoa. http://www.resilience.org/stories/2013-09-24/the-international-year-of-quinoa

Sorensen E. Winter 2013. Tiny Seed, Big Prospects. http://wsm.wsu.edu/s/index.php?id=1072

Weaver M. Dec. 8, 2013. Quinoa research keys on heat tolerance HTTP://WWW.CAPITALPRESS.COM/CONTENT/MW-QUINOA-062613-ART

IMPACTS

The short term impacts of this symposium, including: global networking, an honest and open exchange of ideas, concerns, and differences in opinion concerning the challenges and opportunities of equitable production and marketing of quinoa; and, the development of scientist-scientist, farmer-scientist, and distributor-farmer-scientist-consumer relationships, were seen immediately, beginning during the presentations the morning of the first day. Additionally, by hosting the symposium, WSU was able to highlight our diversity of on-going quinoa research, spanning approximately eight faculty and ten graduate students. The exposure this symposium lent to WSU quinoa research helped establish WSU as one of the leading quinoa research

universities, both in the US and in the international arena. The medium term impacts are yet to be realized, but already we are seeing critical and enthusiastic interest from quinoa importing companies to support quinoa research at WSU in the hopes of developing a robust domestic market. Additionally, two companies have begun preliminary research on the development of one or more quinoa processing facilities in the Pacific Northwest, which will be critical if quinoa production will realize its potential as an emerging, productive and nutritious crop in the US.

DAY 1 (August 12, 2013)

Fig. 1. Symposium participants at the WSU Organic Farm eager to view the WSU quinoa trials.

Fig.2. Sergio Nuñez, a quinoa specialist from Andean Naturals, Inc., translating for the Bolivian farmers. On the foreground is one of the owners of Northern Quinoa from Saskatoon, Canada.

Fig. 3. Dr. Luz Gomez-Pando, principal professor at the Universidad Nacional Agraria La Molina, Peru, joining the discussion on quinoa. Matthew Weaver of Capital Press is taking pictures.

Fig. 4. Dr. Kevin Murphy of WSU and Dr. Juan Antonio Gonzalez, Director of the Instituto de Ecología, Fundación Miguel Lillo, Tucuman, Argentina standing amidst quinoa plants while listening to Dr. Murphy's students talk about their field trials.

Fig. 5. Dr. Murphy's graduate students talk about their research. On the left is Adam Peterson, a Ph.D. student, and Hannah Walters, a M.S. student.

Fig. 6. Dr. Daniel Bertero, Professor, Faculty of Agronomy, at the University of Buenos Aires (Crop Physiology) and researcher at Conicet, the Argentinian National Research Council contribute his expert opinion during the discussion. To his left is Frank Morton, breeder and seed grower of the Wild Garden Seed, Philomath, Oregon, and to his right is Joseph Simcox, botanical explorer. Behind Dr. Bertero is Dr. Hassan Munir, Assistant Professor, Department of Crop Physiology, University of Agriculture Faisalabad, Pakistan. Standing beside Dr. Munir is Dr. Pablo Laguna, an anthropologist who has been working with Bolivian traditional quinoa farmers.

Fig. 7. Dr. Laguna and Dr. Moses Maliro, Plant Breeder from the University of Malawi, and other symposium participants listening intently and taking notes.

Fig. 8. Ms. Tania Santivanez, Technical Coordinator of the FAO's International Year of Quinoa and one of the symposium's featured speakers, confers with Bolivian farmers.

Fig. 9. Dr. Murphy and Dr. Bertero in a discussion while looking at the quinoa plots of Hannah Walters.

DAY 2 (Aug. 13, 2013)

Fig. 10. Ian Clark, first time quinoa grower, talks about the varieties he planted in their family farm in Albion, WA.

Fig. 11. Dr. Murphy and Frank Morton listen to participants' questions about the WSU quinoa variety trials in the Clark Farm.

Fig. 12. Symposium participants examine the quinoa plants and also discuss among themselves.

Fig. 13. Tanya Kerssen, research coordinator of the Food First/ Institute for Food & Development Policy, takes pictures of the different quinoa varieties grown in the Clark Farm.

Fig. 14. Dr. Sven-Erik Jacobsen, quinoa expert from the Faculty of Science, University of Copenhagen, Denmark, confers with other symposium participants.

Fig. 15. Dr. Jacobsen talks with Adam and Sunshine Taylor, entrepreneurs who own the company Habasha Harvest, and are interested in growing quinoa in Ethiopia.

Fig. 16. Dr. Moses Maliro, one of the invited speakers, and Associate Professor of Plant Breeding and Genetics, Bunda College,Lilongwe University of Agriculture and Natural Resources (LUANAR), Malawi, talks with a participant affiliated with the company Australian Quinoa, from Western Australia.

Fig. 17. Dr. Jennifer Reeve, Assistant Professor of Organic and Sustainable Agriculture, Utah State University, and one of the collaborating scientists in the quinoa project spearheaded by WSU and funded by the USDA-OREI, listens together with the other symposium participants.

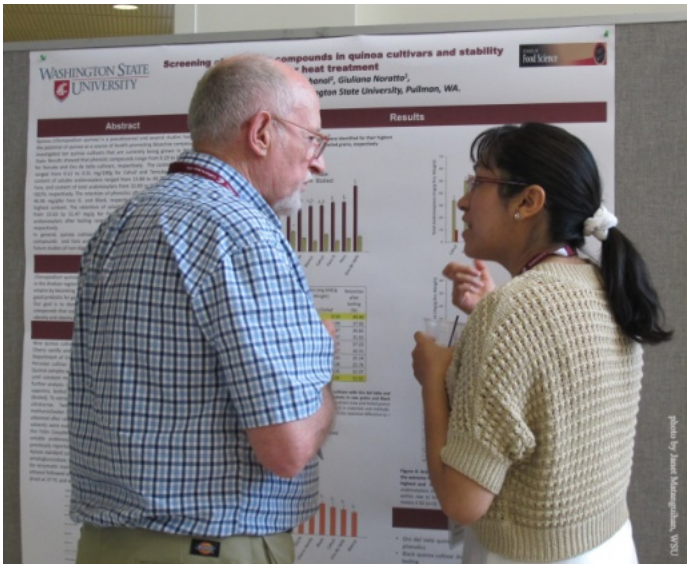

Fig. 18. Rocio Rabanal, a Ph.D. student at the School of Food Science, WSU, discusses her research on quinoa with David Nelson, from Ritzville, WA.

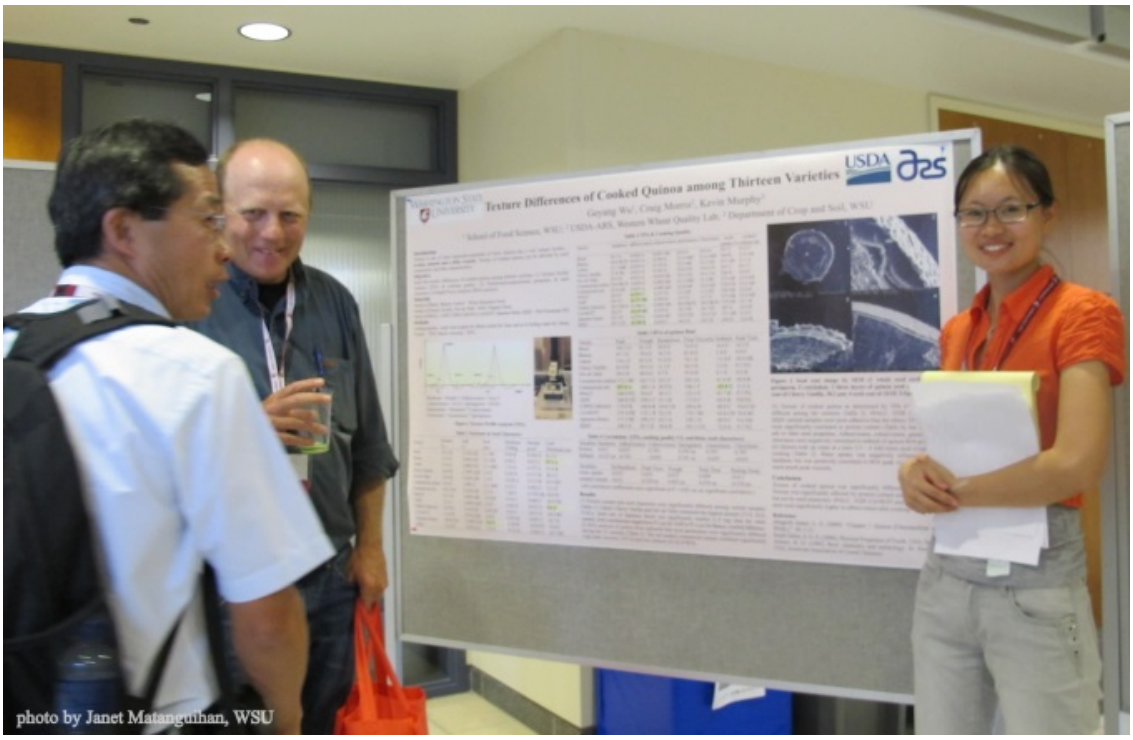

Fig. 20. Geyang Wu, a Ph.D. student at the School of Food Science, WSU, discusses her research on the differences in the texture of cooked quinoa with Paul New, of the White Mountain Farms in Denver, Colorado.

Fig. 21. Dr. Giuliana Norrato, Assistant Professor at the School of Food Science, WSU, discusses her research with Dr. Luz Gomez-Pando of Peru, Dr. Juan Antonio Gonzalez of Argentina, and Mr. Willy Choque Marca, a Bolivian quinoa farmer.

Fig. 22. Quinoa vodka, produced by FAIR Spirits, one of the sponsors of the symposium.

Fig. 22. Participants getting to know other participants while testing the quinoa vodka provided by FAIR Spirits.

Fig. 23. A Bolivian quinoa farmer expresses his opinions on the issues regarding quinoa production and consumption raised up during the symposium. Listening to him are Joseph Simcox, botanical explorer, Kevin Murphy, symposium coordinator, and Irina Stoenescu, food researcher and historian.

DAY 3 (Aug. 14, 2013)

Fig. 24. Dr. Murphy introduces the speakers John McCamant and Paul New (seated on the front row, to the right of Dr. Murphy) of White Mountain Farms. They shared with the participants their experiences and knowledge gleaned from more than 20 years of growing and breeding quinoa in Denver, Colorado.

Fig. 25. Bolivian quinoa farmers shared with the participants their production practices, the marketing system of quinoa in Bolivia, the challenges they face as Andean farmers growing an ancient crop, and their hopes and dreams for their future as quinoa farmers, and for the future of quinoa itself in the world market. Sergio Nuñez, of Andean Naturals, Inc. (middle), translated for them.