Presidential Biography

Paul W. Bosland

President of ASHS, 2012–2013

Regents Professor of Horticulture Director, Chile Pepper Institute, New Mexico State University, Las Cruces

As an ASHS Member for more than 30 years, Paul W. Bosland is known fondly in New Mexico as The Chileman, where he leads the chile pepper breeding and genetics program. He grew up in northern San Diego County in southern California. At the time, there were avocado and citrus orchards, strawberry fields, staked tomato fields, and a thriving nursery industry. He became interested in plant breeding at a very early age. As a schoolboy, he went to the second-hand store and bought old watches. The reason? He had heard that the luminescent hands on the watches were radioactive, and he scraped off the material to try to induce mutants in marigolds. The experiment was a failure, but it was the initiation of his love of horticulture and plant breeding.

After completing two years at Palomar Junior College, he transferred to University of California–Davis (UC–Davis), where he earned a BS degree in 1976 in genetics, and a MS degree in vegetable crops in 1977. While at UC–Davis, he also earned a secondary teaching credential and subsequently taught horticulture at the high school and the community college level. Additionally, he worked in the Cooperative Extension Service as a Research Associate administering vegetable trials in California. After these

experiences, he continued his education at the University of Wisconsin–Madison, and earned his PhD in plant breeding and plant genetics in 1986. He joined the faculty in the Department of Horticulture at New Mexico State University in 1986, where he rose through the ranks to become Regents Professor of Horticulture, Distinguished Achievement Professor, and Director of the Chile Pepper Institute.

Bosland has served ASHS in many capacities, including: Fellows Screening Committee (2009–2011); ASHS-2007 Intel International Science and Engineering Fair judge; ASHS Publications Committee (2007–2009); ASHS Outstanding Graduate Educator Committee (2005–2008); ASHS Outstanding International Horticulturist Committee (2003–2006); Associate/Contributing Editor, Journal of ASHS (2002–2006); reviewer for all three ASHS journals; Vegetable Publication Awards Committee; Vegetable Breeding Working Group; Germplasm Working Group; Herbs and Spices Working Group; and he organized the ASHS symposium on "Chile Peppers as a Spice Crop in the Southwest."

Bosland's awards have included ASHS Fellows Award, ASHS Outstanding Graduate Educator Award, New Mexico Distinguished Public Service Award, Who's Who in America, Who's Who in American Education, Kermit A. Olson Memorial Lecture, University of Minnesota, University Research Council Award for Exceptional Achievements in Creative Scholarly Activity, NMSU Distinguished Research Award, Dennis Darnell Faculty Achievement Award, Wilson's Guide to Experts in Science and Technology, 2000 Outstanding Scientists of the 20th Century, 2000 Outstanding Intellectuals of the 21th Century, 1st Edition, Distinguished Award for Graduate Teaching/Achievement, Gamma Sigma Delta, International Programs Globe of the Month Award, and the infamous IgNobel, Harvard University.

ASHS Presidential Address: Horticulture Creates a Healthier, Happier World

Paul W. Bosland

Palm Desert, CA, 24 July 2013

I began preparing this address by reviewing the 1913 ASHS Presidential Address by Ulysses Prentiss Hedrick titled "Multiplicity of Crops as a Means of Increasing the Future Food Supply." I did this to get an idea of the state of horticulture 100 years ago as a comparison to where we are today. Hedrick writes about the "hard times at hand and famine ahead," while alluding to the fact that "multiplicity" (diversity) of crops may be the answer to world famine. In 1913 the world population was 1.8 billion—today it is 7 billion. Hedrick states that everyone agrees that there are three ways to solve the problem of world famine: 1) conservation of resources, 2) greater acreage under cultivation, and 3) increased yields. He then says there is a fourth consideration, a "multiplicity of crops." He meant that along with agronomic crops, horticultural crops need to be grown to increase the food supply.

Professor Hedrick listed dozens of horticultural crops of the future that may alleviate hunger. A couple have actually become standard in our food aisle, like blueberries and avocados, while others are still being studied, like tepary beans of the Southwest, *Amaranthus*, Chinese jujube, and the paw-paw tree. Others have not made much progress in 100 years, for example, *Opuntia* cactus, swamp potato, and the cloudberry.

He was also disappointed in the progress of breeding these new crops because as he said "Art is long and time is fleeting." One must understand that in 1913 the science of genetics was still fairly new. In fact, the term "genetics" had been introduced into science lexicon only eight years earlier.

If we fast-forward to today, famine is not an agricultural production issue, but a political and economical issue. The world produces enough food to feed everyone; it is the lack of distribution of food that currently causes famine. In the United States, more people are dying from obesity-caused diseases than from starvation. According to the National Institutes of Health, being obese is the second leading cause of preventable death in the United States, close behind tobacco use. An estimated 300,000 deaths per year are due to the obesity epidemic. Another 79,000 people die from type 2 diabetes each year in the

United States. The American Diabetes Association recommends eating more "fresh fruits and vegetables" as a way to lower the risk.

A critical component to a healthy life is nutrition. In the 1800s, Anthelme Brillat-Savarin and Ludwig Feuerbach originated the idea that "you are what you eat." They maintained that food affects one's health and state of mind. From birth, the intake of vital nutrients is essential to the growth and development of a healthy individual. Good nutrition is important in establishing and maintaining a good foundation that has implications for an individual's future physical and mental health, academic achievement, and economic productivity.

As horticulturists it behooves us to face this challenge and champion how we can help. We know fresh fruits and vegetables are an important component of a balanced diet, but many urban areas have spots known as "food deserts," where little or no fresh fruits or vegetables are available. No scientific breakthroughs are needed to solve this problem – the horticultural crops that we have in the world today, combined with political will, can solve this problem. First Lady Michelle Obama, by planting a garden on the South Lawn of the White House, easily became the nation's most highly profiled gardener/horticulturist. Her garden is exactly what we need to encourage people to plant gardens. The First Lady is quoted as saying, "I'm a big believer in community gardens, both because of their **beauty** and for their **access** in providing fresh fruits and vegetables to so many communities across this nation and the world."

A school garden can introduce a variety of vegetables to children early in life. School gardens provide an educational opportunity for horticulture to teach about a viable long-term solution to our health problems. Nutritional deficiencies (undernourishment) within the inner city or in low-income areas can be alleviated by people growing their own fruit and vegetable gardens. These gardens can produce significant amounts of protein, calcium, iron, and vitamins, as well as provide supplementary nutrients to school lunches. Even in an urban setting, one can grow nutritious crops in boxes or pots to provide needed nutrients for growing children.

Just this week I assisted Drs. David Kopsell and Dean Kopsell with a student service project at the Indio Senior Center. The students and us helped them refresh their raised garden beds for the fall planting of vegetables. The fresh vegetables and herbs that will be grown will be very beneficial to the senior citizens.

As a plant breeder myself, another obvious way to increase nutrition is by genetic improvement, breeding fruits and vegetables with increased vitamins and other nutrients; however, it is imperative that the fruits and vegetables taste good. In my breeding program I have found that people prefer flavorful fruits; and the tastes of sweet and spicy are especially popular with young people.

Additionally, we must teach our young people that horticulture is important and essential for a quality lifestyle. They are not only our future horticulturists, but as citizens they also need to understand how horticulture is integrated into their lives. Although children are often timid about eating new foods, the excitement of eating something they produced in a school garden may overcome their fears. Exposure to fruits and vegetables may encourage them to eat more of these beneficial foods.

Horticulturists help to provide more nutritious foods, but we also provide ways to increase our happiness index. Parks and gardens are beautiful and tranquil places. Psychologists have shown that a walk in a park fosters greater happiness. Researchers have found that overall happiness is higher for people who take a walk in the park than for those who take a walk in an urban setting, or even read a book.

Other researchers have found that having flowers around is an excellent way to lower stress and anxiety. People who keep flowers in their home or office feel happier, less stressed, and more relaxed. Flowers can help you achieve a more optimistic outlook on your life, bringing you both pleasing visual stimulation and helping you to increase your perceived happiness.

Then there is the concept of the "greenroof," where a roof is partially or completely covered with vegetation that has been planted over a waterproof layer. Greenroofs help reduce heating and cooling bills significantly, as well as provide a place where flowers and vegetables can be grown. Vegetable gardens located on greenroofs can provide a source of food for the building occupants or the wider community. The Fairmont Waterfront Hotel in Vancouver uses its greenroof to grow herbs, flowers, and vegetables, saving the hotel restaurant $30,000 a year.

Greenroofs create a more pleasant viewscape in the city. Researchers have found that when people look out their office windows and see a greenroof, they are happier. Those workers with access to a window to see the greenroofs had reduced stress, increased productivity, and fewer sick days. A study of patients in a hospital found shortened healing times for patients who have access to see or walk through greenroofs.

One hundred years later, having access to a "multiplicity of horticulture crops" can still help the well-being of both children and adults. Horticulture brings nutrition and happiness together. As I look out over the audience I realize the potential to make great strides in improving the world through horticulture. I took the keywords for this presentation and searched our ASHS journals. If one peruses our ASHS journals, every one of the topics I have discussed has been, or is being, studied by our members. I found more than 4,000 articles published related to these topics.

Horticulture is a very important part of our existence. We need to remind ourselves that we are continuously working to provide the rest of the world with a "multiplicity" of nutritional crops that help to reduce famine, promote lifelong health, and address many food-related diseases. So next time you bite into that fresh vegetable or fruit, don't forget that you are part of the solution to some of the world's biggest problems. Together our greatest contribution is, and will be, creating a healthier, happier world.