Oregon's Horticultural Success Story: the Hazelnut©

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I want to thank Verl Holden and Gayle Suttle for the invitation to visit with you this morning. I am deeply honored to be a part of your program. Including the topic of hazelnut production while in Oregon was brilliant!

HAZELNUT PRODUCTION – A WORLD PERSPECTIVE

Hazelnuts (*Corylus avellana*) survive in many varied climatic and soil conditions; however, to consistently yield enough for a commercial crop they require more suitable conditions. The soil must be good quality and although hazelnuts love rain, the soil must be well-drained as they are not fond of wet feet. The climate must be mild without long periods of extreme cold or extreme heat. It appears that the 45th parallel provides excellent conditions. In the Northern Hemisphere the current production areas include the Black Sea region in Turkey, Georgia, Azerbaijan, Italy, Spain, and Oregon. In the Southern Hemisphere hazelnuts are being cultivated in Chile, South Africa and Australia.

Turkey is the largest producer of hazelnuts by far with about 70% of world production. Oregon produces from 3 to 5% of the world's supply. In Turkey the cultivars grown are smaller in stature, bearing smaller nuts that are more conducive for use as kernels than as inshell. Trees are grown as bushes that grow on the sometimes steep hillsides along the Black Sea. There are thousands of growers that have 1 or 2 ha of hazelnuts planted. The hazelnuts are harvested by hand and spread out to dry in the sun. When dried and husked they are transported to very large modern processing facilities where most are shelled, further processed and shipped throughout the world. Notably, the dependency on the weather for the drying process can be disastrous for the industry. Timely drying is imperative for top quality product.

THE OREGON HAZELNUT INDUSTRY

The Oregon industry is comprised of about 650 growers, many multigenerational. The average-size orchard is 50 acres. Horticulturally, as you are likely already aware, the hazelnut tree is quite amazing. In Oregon, growers culture the trees to grow with a single or multiple truck system, but suckers are controlled so trees do not become bushes. While other trees are dormant during the winter months, the hazelnut trees are busy propagating. The catkins elongate in December and a wondrous yellow appears among the bare tree limbs. Wind and rain disperse the pollen to the tiny red flowers which can barely be seen. Later in the spring fertilization occurs and by mid-summer there are signs of tiny nuts forming.

As the summer progresses the nuts become more prominent and by late-summer they begin to take on the "hazel" color. When fully mature the nuts fall free of their husks to a carefully managed clean orchard floor. Growers mechanically harvest their crop by sweeping nuts into windrows and then picking them up with a harvester. The harvester is designed to eliminate sticks and leaves and the nuts are conveyed into totes or in bulk trailers. They are immediately transported to handlers who wash and dry them as quickly as possible. This helps ensure the quality of Oregon hazelnuts. After drying the nuts are sized and sold either in the shell or cracked and further processed. All Oregon hazelnuts are graded for size and quality by the U.S.D.A. before being put into any channel of trade.

During 2012 the crop totaled 37,000 short tons. Sixty-nine percent of the crop was exported in the shell. The rest was either shelled or sold domestically in the shell. A large majority of the exports went to China where most are slightly cracked, soaked in a brine solution and roasted. They are consumed as snack nuts.

Here in the U.S. most hazelnuts are sold as ingredients. They are found in a range of

foods including health bars, yogurt, spice blends, ice creams, snack mixes and, of course, with their favorite partner, chocolate. Portland is known for its breweries and several hazelnut beers as well as hazelnut rum.

THE OREGON HAZELNUT GROWERS

The individuals who grow hazelnuts in Oregon are a hardy lot. They are forward thinkers and anxious to share their successes and failures with their fellow growers. The Oregon hazelnut industry would not exist today were it not for their decision to partner with Oregon State University (O.S.U.) to figure out how to overcome eastern filbert blight (EFB), which reared its head about 30 years ago. Growers attacked this disease that was responsible for the demise of the industry on the East coast via a two-pronged approach. Long-term, they engaged the O.S.U. breeding program, specifically, hazelnut breeder Dr. Shawn Mehlenbacher to add EFB resistance to the traits for which he was selecting. Support from the industry and other sources enabled Shawn to travel the world to identify potential EFB resistant parents for the program. Short-term, growers engaged the OSU plant pathology department to learn more about the disease and create methods to keep trees alive long enough for the breeding program to release completely resistant cultivars.

The results are quite graphic in this history of hazelnut production over the last 17 years. The acreage over this time and immediately prior to this was pretty constant at about 28,000 acres. Very few growers even considered planting additional acreage when the trees they were to plant would definitely become blighted. Hazelnuts are alternate bearing, so there were obvious on and off years. But, if you look at the trend, it was clear that all the efforts to figure out how to manage the disease were ultimately beneficial to the industry. Precision pruning, protective spraying, ensuring proper nutrition for the tree at the most beneficial times of the year; all these practices and others were paramount in keeping EFB infected trees in production. The industry also instituted a control order so that trees from the infected area could not be transported to the uninfected area.

In the late nineties Dr. Mehlenbacher released ‘Lewis’, ‘Clark’, and ‘Sacagawea’, each with quantitative resistance to EFB. Growers started thinking about the more resistant cultivars that were on the horizon. Soon the growers began to plan for the release of completely resistant cultivars. They put resources into researching how to micropropagate the hazelnut (Fig. 1).

Fig. 1. A young plantlet coming out of micropropagation.

Prior to this it was felt there were issues that made micropropagation impractical. Some of the micropropagators in the audience today were willing to meet with the industry and discuss their thoughts on micropropagating a crop that would stay in the ground over 100 years...translation...may NOT make them a lot of money over time. With contributions of knowledge from all sectors, the mechanics of hazelnut micropropagation were developed and an additional avenue for growing new cultivars in large numbers was born.

'Jefferson', 'Yamhill', 'Dorris', 'York', 'Felix', and 'Wepster' were released along with other compatible pollinizers. Each release provided opportunity for growers to begin to pull out their infected trees and plant with new resistant cultivars. Concurrently, the price stayed pretty stable and the industry attracted the attention of some farmers of other crops. While statistics are not complete at this time, it appears that, very conservatively, there has been an increase of 3,000 new acres planted each year beginning in 2009.

The push for EFB resistant cultivars with high-quality characteristics has not slowed. Dr. Mehlenbacher and his colleagues are now looking at various sources of resistance and the layering of resistant genes to ensure cultivars that will stay healthy over time. The micropropagators are serving an increasingly important role as more cultivars are released and the demand increases.

I would like to extend a special thank you to the members of the team of hazelnut plant breeders at O.S.U., the propagators and the members of related disciplines such as plant pathology and extension, who have created a "light at the end of the EFB dark tunnel" and have provided inspiration for growers to continue to plant and for new growers to begin to plant hazelnuts in Oregon and Washington.

MORE HAZELNUTS MEAN MORE MARKETS

Skeptics have looked at this growth and indicated it may be difficult to sell more Oregon hazelnuts. While Oregon has traditionally not had a problem with selling hazelnuts, an expansion of the industry at this point in history provides incentive to marketers to tap young markets. It is an excellent time for this. The industry has yet to reach the critical mass necessary to be of interest to those large brand name buyers right here in the USA. With new acreage, this will be possible. In addition, there are other markets around the world as yet untapped.

The importance of tree nuts for health cannot be underestimated. The hazelnut provides not only the health benefit but also an amazing flavor and crunchy texture that make it a premium nut. The hazelnut is part of the group of tree nuts that sport an FDA qualified health claim for heart health. The nutrient profile of the hazelnut includes Vitamin E, folate, minerals, and phytonutrients each providing unique health benefits.

To summarize then, thanks to long term thinking multigenerational growers, plant breeders, propagators in this room, and the inherent qualities of the species; if you are looking for that silver bullet food, hazelnuts, packed in their own protective shell, may just be the closest you will find. We call them "Indulgence in a Nutshell."

They are easy to incorporate into any dish. Unlike some foods, they are not very perishable. Unlike wine you can eat them and drive. And, they are sustainable — they have been around for over 4,500 years. When you are done cracking them, just throw the shells in your nearest planter or flower bed — they make amazing mulch.

Harvest is upon us and the holiday season is approaching. Maybe you will add hazelnuts to your own culinary creations. When you do, perhaps you will feel the "smiles" from the large team of folks who have made Oregon hazelnuts possible. Thank you so much.

QUESTIONS AND ANSWERS

Richard Criley: Why the name hazelnut instead of filbert?

Polly Owen: They were all called filberts until we started exporting them. Many people around the world didn't recognize that name so we went to "hazelnut."

Richard Criley: What constitutes "quality" in a hazelnut?

Polly Owen: Quality measures include size, flavor, and crunchiness. The relative importance of these three characteristics can change depending on how the nut is used.

Scott Ekstrom: How and when are hazelnuts picked?

Polly Owen: For more than 100 years there have been two main cultivars, ‘Barcelona’ and ‘Ennis’, but with the newer cultivars that are resistant to eastern filbert blight we have a huge transition going on. For the most part they were sold as “in-shell” and the kernels were the by-product. What we’re beginning to transition to is an era where you will be marketing 5-year cultivars and with a mix of kernel cultivars with in-shell cultivars. A more important consideration is getting the proper cultivars planted together for cross-pollination and maximum yields. Compatible cultivars in terms of yield, bloom time and pollen shed must be planted together.