

White Paper: Pear Research Roadmap

Current situation, vital needs and research priorities for enhancing profitability and global competitiveness of the pear industry

This is a synopsis of a white paper that is being currently drafted. This document summarizes urgent pear industry needs and research priorities that will modernize the pear industry so that its profitability and global competitiveness can be enhanced.

Introduction: This document has been developed using real-time information gathered at WA, OR and CA pear orchards, processing and packaging sheds, and from pear marketing boards in the same three states since 2009. The WA, OR and CA are key players in pear production, with the West coast representing more than 95% of the US Pear industry however east coast researchers and industry will play an important role in the determined research priorities. A US pear industry-sponsored week-long International Pear Workshop in July 2011 served as a platform to document the information and prioritize near, medium and long-term goals of the industry. The workshop was attended by the US pear research community (east and west coast) and pear science experts from Spain, Italy and Argentina.

Current Situation: The US pear industry is economically stagnant. There is an urgent need to increase its profitability. Decreasing trends in pear consumption are matched by increasing concerns for a sufficient labor supply. This is especially relevant in the face of several other competitive products such as other fruits and fruit-containing health products on the market.

Pear orchards in the US are ageing and outdated resulting in decreased fruit quality with little vigor management. The old, three dimensional trees lack consistent fruit set and the resulting fruit size is highly variable. One of the critical reasons for this state is a lack of dwarfing and precocious rootstocks suited to the production environment in the US. There is also a lack of uniformity in trees for new plantings, which are few and far in between. There are several plant propagation and nursery-related issues linked to the non-availability of an adequate rootstock.

Due to the high variability in pear production systems, there is a lack of best management practices for pear production and crop load indices. Existing yields are driving down profitability, and furthermore, the current orchard architecture is not amenable to implementation of mechanization that could potentially provide cost-savings and reduce the issues of labor shortage. As production costs are rising, there is a need to increase productivity to recover those costs. Establishing further quantitative and qualitative economic information addressing the issue of time-value money for orchard production or time to return on investment is necessary. The industry and researchers conclude that the existing genetic diversity in *Pyrus* is not being exploited to address the above-mentioned critical production-related questions.

The ageing orchard infrastructure doesn't bode well for the safety of an already scarce labor force. There are major concerns related to ladder safety. Typically the ladders are 10 to 16 feet tall. The pear industry is unprepared for the near-term challenges of policy change in immigration regulations and customer expectations in labor safety. In addition, adverse environmental effects due to the use of pesticides, chemicals and water use come into question with the current infrastructure. The pear industry is extremely fragile and has a large carbon footprint.

At the consumer level, the pear industry has fallen short of providing a consistent organoleptic experience to the consumer. This is in part due to the high variability of fruit obtained from outdated production systems. Not much emphasis has been provided to fruit finish

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and promoting product uniformity. The lack of a ready-to-eat pear and variable ripening requirements confound the issue further. There are numerous post-harvest pathological and physiological disorders that plague the pear industry also raising issues about food safety. Further, the biology of pear fruit has not been carefully considered to devise appropriate handling and packaging throughout the value chain. There remains a clear disconnect between the customer and the retailer who sets high and narrow standards for food quality. There are strict market constraints with current varieties and the situation is worsened by an inelastic demand curve. To make matters worse, there is strong resistance to new varieties at the retailer and packer level.

What the consumer wants in a pear fruit remains largely unknown. Consumer preference studies are inadequate for pears forcing the retailer to follow marketing strategies for other fruit such as apple. More information could be made available to the public on the health benefits of pear consumption; pears are known to be one of the most hypoallergenic fruits and recent data indicates their beneficial qualities for combating diabetes. Pears are rarely used in processed food markets which could be one avenue to boost domestic consumption and enhance profitability. In the US, there are only a handful of pear varieties available at the retail level consequently the consumer lacks the experience to sample the diversity in pear germplasm.

It was concluded that there is insufficient pear research being conducted in the public domain. There needs to be stronger integration of extension to translate the research outcomes into practice at the industry level. There is an urgent need for an excellent quality product aligned with consumer demand.

The pear industry ratified the research community's plan of action to address two major areas of pear research which can deliver enhanced profitability in the next five years while developing a research infrastructure for sustained progress in reinvigorating the pear industry over the next two decades. A research proposal is currently being developed to be submitted to a USDA SCRI panel with the following scientists leading the effort with a team of over 30 US and International scientists.

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USDA-ARS

Richard Bell, Research Horticulturist and pear breeder

Objective 1 – Modernize pear orchard systems to accommodate mechanization

The first part of this objective will enhance near term sustainability and profitability of pear production in the U.S. In the first five years, we will deploy previously researched, commercially-viable training systems. We will generate production research results along with socio-economic information addressing labor issues, and related feasibility of various avenues of mechanization. We will also address energy use in the context of the carbon footprint of the pear production system. In order to lay the foundation for longer term (beyond five years) sustainability and competitiveness, the second part of this objective will be to develop comprehensive research and socio-economic information on previously untested new and existing genetic resources, including rootstocks and cultivars.

Objective 2 – Ensure consistently superior fruit quality to increase consumer acceptance

This objective will focus on deploying fruit conditioning research at the wholesale and retail value chain level to provide the consumer a consistently positive organoleptic experience. We will study consumer behavior and use results from our studies to inform the beginning of the supply chain (production, handling and packaging) in order to drive adoption of improved practices. We will also develop genetic and genomics information related to existing and new germplasm and cultivars.