GROWING KNOWLEDGE

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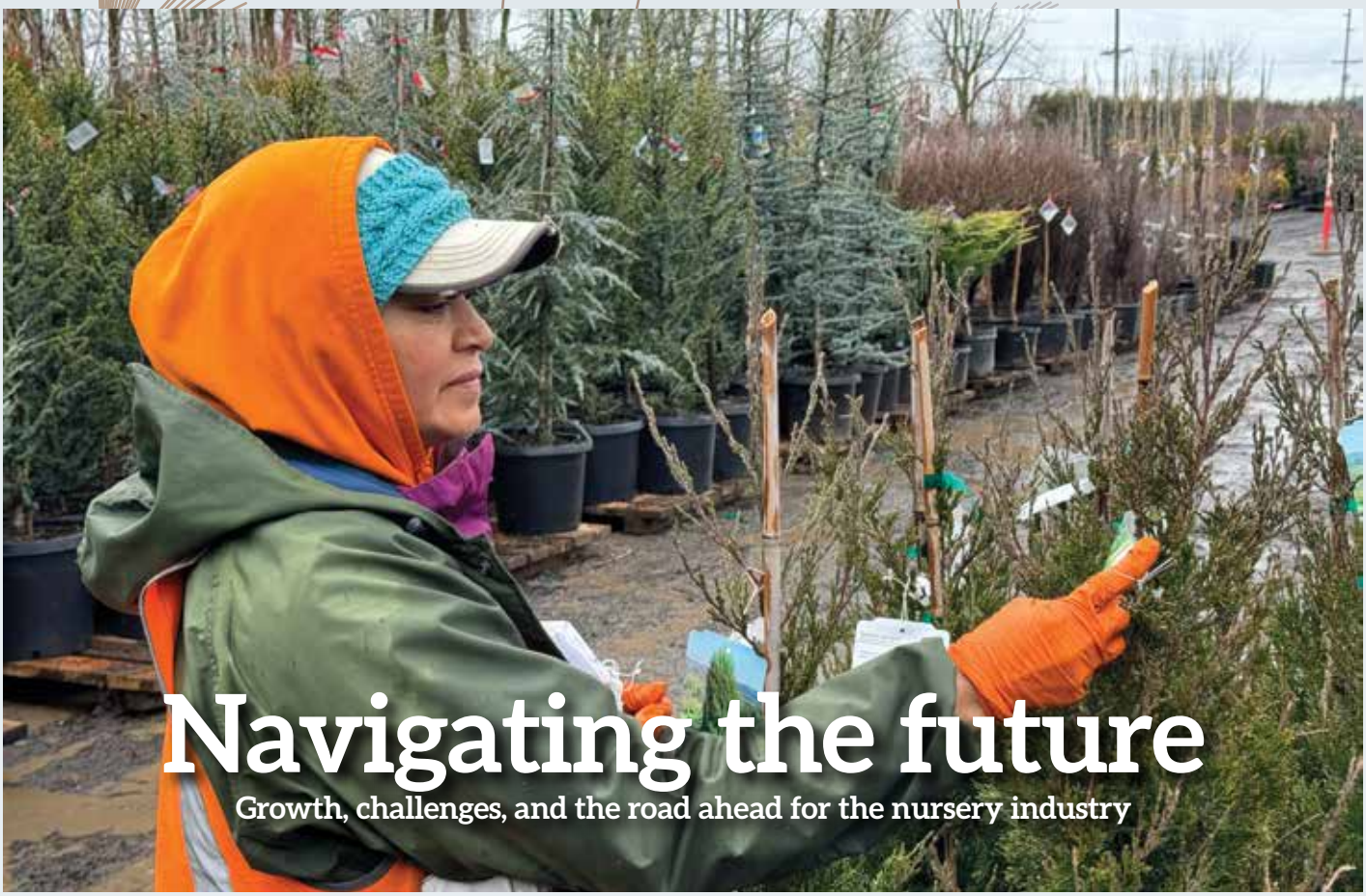


Navigating the future

Growth, challenges, and the road ahead for the nursery industry

Minorva CIsneros checks tags on an order of plants being prepared for shipping at Bountiful Farms. Nurseries are having a harder time finding labor and costs are rising, according to nursery science researchers. OAN FILE PHOTO.

BY LLOYD NACKLEY, JEB FIELDS, AND RYAN CONTRERAS

In a recent article published in *HortTechnology*, titled "How Natural Resources, Consumer Perceptions, and Labor Are Transforming the U.S. Nursery Industry," nursery science researchers from across the United States examined the current state and future of the nursery industry.

The paper, available free online (**TinyURL.com/IndustryPaper**), highlights the substantial economic impact of the nursery industry, which generates $13.8 billion annually through the sale of live plants, including $4.55 billion from woody ornamentals.

Despite this robust revenue, the industry faces significant changes and challenges. The experts identified three primary areas that continue to shape the industry's future: labor, natural resources and consumer trends.

In this review, we'll focus on what the national researchers found and how that's relevant to Oregon and West Coast production.

Labor supply, labor demand, and mechanization

As every nursery operator in Oregon knows, labor is crucial for the sustainability of production and operations.

The research highlighted major labor challenges. Some 42% of respondents reported insufficient availability of qualified labor. From sales reps, to skilled laborers in production, to shipping and spraying, it's difficult to find qualified people for all positions. The researchers documented some of the causes.

Over the past 20 years, there's been a decrease in family labor and an increased need for hired workers in agriculture. This shortage is a significant problem in many agriculture industries, including the nursery industry. Several factors affect the availability of workers. These include the aging domestic workforce, lack of interest from local workers, and stricter immigration and guest worker regulations.

The shortage of labor is also connected to increasing costs. According to the research, 22% of nurseries cited increased wages as a limiting factor for new

Many nurseries like Woodburn Nursery & Azaleas have incorporated semi-automatic pruning machines to support labor. OAN FILE PHOTO.

hires.

Since 1999, labor costs for the nursery and greenhouse industry have steadily increased. Labor costs rose from less than 30% of total gross cash farm income in 1999 to about 35% in 2020. Though a 5% change over two decades might seem small, these costs are now at a 20-year high. Studies estimate that labor accounts for up to 40% of production costs in the nursery industry, especially as more operations adopt soilless production practices.

Compensation has also increased, either due to higher minimum wages or as a way to attract and retain employees. Despite the sales growth in the green industry, all operations are looking for ways to reduce labor costs and secure reliable labor. Many nursery operators are looking to automation and mechanization to save on labor costs and address labor shortages. Autonomous greenhouses and robotics are some of the high-tech investments being pursued by ornamental horticulture businesses. How these technologies are used will depend on the specific production methods and the size of the operation.

Every year, the Farwest tours offer opportunities for growers to visit nursery operations that are embracing tech innovations. In years past, we've seen how **Bountiful Farms Nursery Inc.**, **Woodburn Nursery & Azaleas Inc.**, and **Brentano Tree Farm LLC**, among others, have incorporated semi-automatic pruning machines to support labor.

Meanwhile, large greenhouse nurseries like **Smith Gardens Inc.** and **Fessler Nursery Co.** are incorporating planting and sticking machines to increase propagation. Likewise, pot-filling machines and conveyor belt systems, which would have been less common a generation ago, are now ubiquitous in high-volume production operations.

Artificial intelligence (AI) can also play a role by helping to streamline and monitor production, as well as manage risks like pesticide damage and irrigation issues. Of course, AI is on the cultural consciousness inside and outside of agriculture.

Within nurseries, research is looking at how AI can automate decision-making processes. For example, Oregon State University teams have been showcasing how to incorporate sensor-based irrigation into nurseries for years. A common impediment is how to integrate the information from the sensors into practices. AI is seen as a potential avenue to interpret sensor and weather data to adjust irrigation schedules.

Another technology that has roots in Oregon nurseries is the Intelligent Sprayer System, designed by the USDA, with trials conducted by Oregon State University and Oregon growers like **Hans Nelson & Sons**, **J. Frank Schmidt & Son Co.**, and **Bailey Nurseries Inc**. This LiDAR-based retrofit system helps shade tree nurseries reduce spray volumes by only spraying the trees and not the gaps between them.

Natural resources: water,

Water resource management has been a key issue for nurseries. PHOTO BY ARTURSFOTO

fertilizer, substrate

Natural resources are the foundation of nursery production. The research team considered key resources that nursery growers rely on, their potential future limitations, and new approaches to ensure long-term sustainability.

Historic extreme weather events are becoming more common and are directly straining nursery operations. For example, ice storms this past winter knocked out power in three Orgon counties — Yamhill, Washington and Clackamas — leaving many growers scrambling to preserve their greenhouses. Similarly, can yards were stressed by low temperatures. Some growers shared reports of higher-than-usual losses from cold stress.

These cold events also widely damaged suburban landscapes, increasing the demand for new plants.

In addition to extreme temperatures, water resource management has been identified as a key natural resource challenge. Nursery producers face several challenges, particularly with water availability, contaminants, and human health.

Water for crops will be affected by droughts, flooding, and competition for quality water. Global temperatures have risen by 1 C from 1895 to 2016 and are expected to rise another 1.4 C from 2021 to 2050.

Precipitation patterns are also changing, influenced by El Niño (wetter) and La Niña (drier) cycles. These changes will affect irrigation methods, plant choices, and water storage practices. Growers across the country are considering designing or upgrading retention reservoirs to capture more surface water during storms.

Contaminants in irrigation water, such as plant pathogens, salts, and sediments, can harm plant health. If contaminated water leaves the nursery, it can impact environmental health and community perception. Sediment is particularly problematic because it carries other contaminants during irrigation or storm events. Improving sediment management is essential for on-farm water management.

Pesticide use and its effects will also face more scrutiny, pushing growers to be more proactive in managing contaminants. This is crucial for maintaining community trust in the safety of their water and ecosystem health.

Regarding human health, climate change (e.g., higher temperatures earlier in the season) and nutrient-rich water on farms may increase harmful algal blooms, affecting production practices. The use of plastics in nurseries (e.g., shade cloth, containers) also has researchers' attention, with environmental toxicologists investigating how microplastic particles can carry pesticides and other contaminants.

Some nurseries are already considering alternatives to plastic. For example, in Oregon, the EarthPot, from **OBC Northwest Inc.**, is soil media in a cellulose wrap to reduce a dependence on plastic while still producing healthy plants.

Benefits over features, market demands and consumer perception

Consumer perception and preferences drive the nursery industry as much as any other agricultural businesses. Understanding consumer behavior and industry practices is therefore vital to navigating the dynamic landscape of the nursery industry.

Researchers tend to group consumers into a few categories to help describe purchasing behavior. Those categories include *plant*-, *price*-, or *production*-focused people, with *plant*-focused consumers making up the largest share — two thirds of consumers.

These consumers prefer shrubs, trees, and indoor flowering potted plants. They prefer to shop at independent garden centers and are more likely to have a yard that they maintain. This consumer group is of great importance to the nursery industry because of the number of new homes being built and new homeowners entering the market. In 2021, 43% of older Millennials (31-40 years) purchased a home for the first time. This creates a possible opportunity for the nursery industry as these new homeowners often wish to decorate, remodel, and arrange their landscape to fit their needs.

Across the U.S., yards are becoming smaller, houseplants are on the rise, and marketing attention often highlights "ecosystem services." When consum-

ers make purchasing decisions, they often opt for benefits, such as *pollinator-plants* or *water-wise* plants, rather than features, such as flower or foliage color. It is important to communicate with consumers about what the product can do for them. Plants provide emotional, physical, social, environmental, and economic benefits (e.g., energy savings).

Consumers are also focused on production practices, and research has shown that wording is very important in the decision-making process. For example, the words local, compostable pots, recycled pots, and bio-pots, were rated highly. We've seen this expansion in compostable pots with new additions by companies like *RootMaker*, and *Ellepot*.

This interest in biodegradable pots is also promising for scientists such as Jooyeoun Jung, a food science and technology professor at Oregon State University. He has been developing pots made from recycled plant material, like apple pulp and hemp hurd.

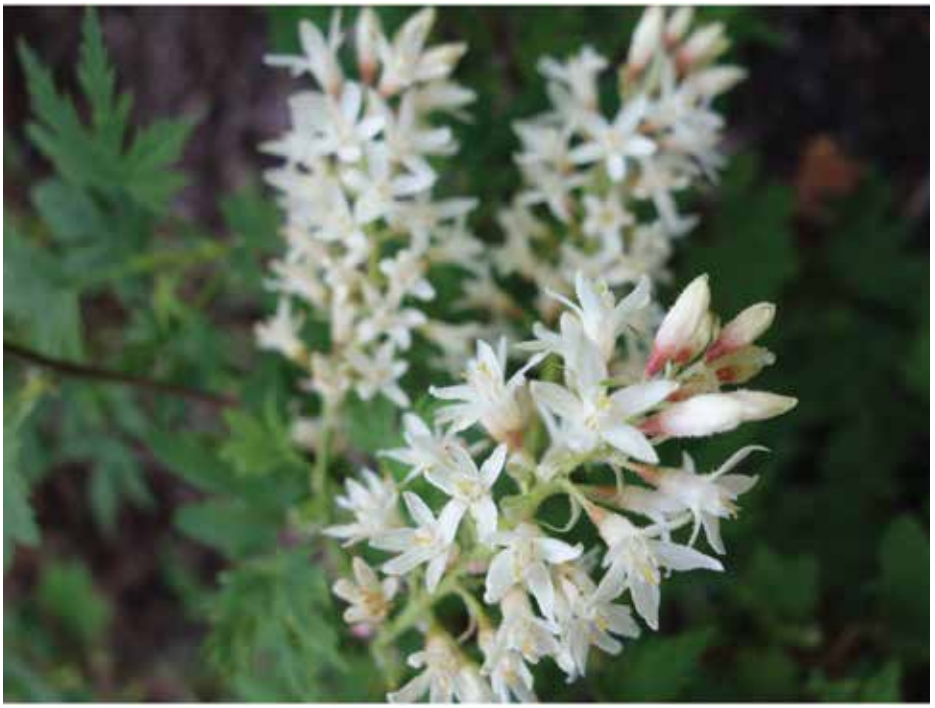
On the other hand, more generic words like organic and sustainable did not correlate as clearly with consumer purchasing decisions because these principles they have multiple definitions and are broader in their interpretation.

In the future, the nursery industry needs to be specific about environmental activities in which the nursery industry is participating and assist consumers with properly identifying what is important. To meet evolving consumer expectations, the nursery industry must prioritize environmental stewardship and assist consumers in making informed choices.

Role of plant breeding

The landscape of ornamental plant purchases and marketing is dynamic. However, the prolonged breeding cycles of woody plants pose challenges in anticipating future demands.

As we contemplate future limitations, several key goals emerge. Foremost among these are addressing issues of water scarcity, labor efficiency, and heightened pressures from insect pests, diseases, and temperature fluctuations.



A resurgence in interest in native plants is driving native plant sales. Oregon State University introduced *Ribes sanguineum* 'Oregon Snowflake', an Oregon native plant. PHOTO COURTESY OF OSU.

Along with the trends has been a resurgence in interest in native plants. Research shows that the number of native plant nurseries and sales of native plants have increased nationwide, as growers try to capitalize on consumer demand. There is even new legislation driving native plant sales. For example, New Jersey S-83 Law, Delaware Bill 22, and Illinois HS5450 all encourage native plant sales or distribution at the state level.

On the national level, Congress passed Senate Bill 557, the Native Plant Species Pilot Program Act, in October 2022. This bill establishes a pilot program for native plant species and a study on the cost-effectiveness of using native plant materials to carry out land management activities on federal lands.

The Department of the Interior is currently coordinating activities with the National Seed Strategy of the Bureau of Land Management, the Plant Conservation Alliance, and the Plant Materials Centers of the Natural Resources Conservation Service to carry out the pilot program. Examples of newly released selected native varieties include *Vaccinium ovatum* 'Cascade Jewel', a popular evergreen huckleberry; or *Ribes sanguineum* 'Oregon Snowflake'.

Oregon State University introduced both plants. They were evaluated by commercial nurseries and chosen for their improved growth habit, vigor, and performance in production.

Another example is the huge growth in demand for milkweeds (*Asclepias* spp.). This genus of plants with many species native to North America received little attention outside of restoration and specialist collectors. However, the plant is widely marketed now, because it is essential to creating a habitat for the Monarch butterfly.

While trends may evolve, certain plants endure as timeless classics. The need for resilient plants in landscapes is undeniable. That's particularly true in regions facing the impacts of climate change, such as dwindling water resources and more extreme temperature fluctuations.

However, there exists a paradoxical trend exemplified by the widespread introduction of bigleaf hydrangea (*Hydrangea macrophylla*) cultivars, notorious for their high water demands. In some regions, climate change will reduce available water, increase temperature extremes, and place landscape plants under more stress. Nevertheless, demand remains high.

One reason for this demand, aside from the innate beauty of bigleaf hydran-

gea in flower, is marketing. The rise of plant brands and their marketing power has had a marked impact on what consumers purchase. Despite concerns about sustainability, effective marketing strategies continue to drive consumer demand.

The future of the U.S. nursery industry hinges on its ability to adapt to evolving challenges and opportunities. Understanding labor dynamics, natural resource management, consumer preferences, and breeding innovations are crucial for sustained growth and resilience.

Oregon and the West Coast, with their unique climates and production practices, offer a microcosm of these national trends. By leveraging technological advancements, embracing sustainable practices, and aligning with consumer demands, the nursery industry can navigate the complexities of the market and continue to thrive.

As the industry faces these multifaceted challenges, it remains vital for growers, researchers, and policymakers to collaborate and innovate, ensuring a vibrant and sustainable future for ornamental horticulture.

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