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JUNE 2020

White blooms

PAGE 16

Nursery production and social distancing

PAGE 21



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Part 2: This palette of white-blooming trees and shrubs provides strong design options. In April's issue, Part 1 featured perennials, groundcovers, bulbs, vines, edibles and hydrangeas.

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On the cover: *Camellia japonica* 'Sea Foam' provides white flowers from the winter to spring. PHOTO COURTESY OF WIKIMEDIA

On this page: Left: Bailey Nurseries changed its process of transplanting liners by slowing the line down and removing people to enable worker distancing. The grower has taken a hit in production in exchange for greater worker protection. PHOTO COURTESY OF BAILEY. Right: A small prototype of a 3D gantry system for smart greenhouse production was built in Corvallis, Oregon. PHOTO BY ARIEL STROH

Nursery Guide



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Guides along life's journey

Throughout life, we run across people who affect us in positive ways.

Teachers, coaches and friends can all have an influence upon us that lasts a lifetime.

Within the nursery industry, mentors can be found just about anywhere. They can be bosses, co-workers, or even competitors down the road. They can also be family members working with you in your business.

Throughout my life, I have been fortunate to have my father and (much) older brother to serve as role models for how to be a businessman, an effective leader, and an advocate for our industry. They have helped to shape who I am today, and have influenced the lives of many around them.

My father, Jerry Sr., has always believed in “working until the job is done.” He has always set the example: Work hard, be honest and fair, and the rest will take care of itself.

He has a wealth of knowledge in the growing of our plants, and also in business. Being able to get advice on nursery work or being a father has been invaluable. He and my mother started our business from the ground up. It is a constant joy to see them every day around the nursery and learn from their guidance.

My brother Jerry’s youngest daughter, Joanna, also grew up on the nursery. Her aspirations are taking her to a different place — down a path to political advocacy. She credits her dad for inspiring her to work in politics.

When Joanna was young, my brother served as president of the Oregon Association of Nurseries and was very involved in the OAN Government Relations Committee. He saw the need to get our business’ point of view out to our elected leaders, and impressed this upon her. The biggest lesson is that calm, reasonable communication is more effective than the opposite.

Joanna saw the benefit of what political advocacy can do for a group of businesses, especially a group like the OAN, which is made up of family-run operations.

One of the best examples was when Tom Vilsack, who served as Secretary of Agriculture in the Obama Administration, came to Oregon and toured our nursery. He wanted to talk about the impact of Sudden Oak Death regulations and how they were affecting Oregon nurseries.

That tour and meeting took the real-world impacts of the proposed federal regulatory approach to the pathogen and made them real. It made a difference in the outcome. The issue of plant health was still addressed, but not in a way that hurt us.

It wasn’t about Democrats, Republicans or any party affiliation. It was about working together and solving problems.

Jerry has not only been a great older brother and business partner but also a mentor to me. He influenced me to become an active member of the OAN and I have followed in his footsteps to become the president.

As I watch my kids grow, I often think about how I can surround them with good examples and role models in their lives. They have a strong grandfather and uncle to start, and I hope a dad as well. Whether they choose to work in the nursery industry or find their own path, I hope that I can be a mentor that helps them along their life’s journey.

Happy Father’s Day to all the dads out there.

Thank you to all the mentors who help our industry grow and thrive. ☺



Jim Simnitt
OAN PRESIDENT





Northwest News

OAN members and chapters are encouraged to send in relevant news items, such as new hires, new products, acquisitions, honors received and past or upcoming events. Email news@oan.org.



Efforts being made to prevent spread of Asian giant hornet

Washington state and British Columbia, Canada recorded the first North American sightings of the Asian giant hornet – the world’s largest species of hornet – in December of 2019, and entomologists are trying to prevent the pest from establishing in the United States, the *New York Times* reported (tinyurl.com/ycgagbxv). The so-called “murder hornet” can decimate entire hives of honeybees in hours and can have a negative impact on the environment, economy, and public health of Pacific Northwest, according to the Washington State Department of Agriculture (WSDA) website.

Researchers are setting up a grid of geotargeted traps and are considering the use of thermal imaging to find hot nests of hornets underground. Radio frequency identification tags can be used to track hornets flight patterns or even small streamers attached to their large bodies.

Factsheets in English or Spanish from the WSDA website for outdoor workers who may encounter the hornets is available at tinyurl.com/ya6tgbz6.



The Oregon Convention Center in Portland, Oregon cannot host the 2020 Farwest Show due to the governor’s phased reopening plan, which forbids all large gatherings in the state at least through September. PHOTO BY BILL GOLOSKI

2020 FARWEST SHOW CANCELED DUE TO COVID-19 PANDEMIC

The 2020 Farwest Show in Portland, Oregon has been canceled due to the COVID-19 pandemic, according to show producer the Oregon Association of Nurseries (OAN).

The show, for nursery and greenhouse operators and professionals, had been scheduled for August 26–28 at the Oregon Convention Center in Portland, Oregon.

“We are very disappointed not to be able to hold Farwest in 2020,” Farwest Show Chairman Patrick Newton of Powell’s Nursery Inc. (Gaston, Oregon) said. “Our show dates back to 1973 and is the biggest nursery trade show in the West. We know what Farwest means to the industry — it’s where nursery professionals from all over the region, the country and the world renew old connections, make new ones, gain new knowledge, advance their careers, find new customers and discover new plants and products. We will now focus on bringing the industry back together for a strong and vital show in 2021.”

OAN leaders initially held off making any decision on the 2020 Farwest Show. Instead, they

waited to see how the pandemic might evolve, and how that might affect their ability to produce the show safely and successfully.

However, on May 7, Oregon Gov. Kate Brown announced her phased plans for reopening Oregon for business and public life. Included was a stipulation that large public events may not take place in Oregon at least

through the end of September, or until treatments or vaccinations for the coronavirus are available. As a result, the Oregon Convention Center determined it could not host the event as scheduled.

The OAN is currently reaching out to exhibitors, partners, sponsors, speakers and others connected with the show to communicate the decision and outline next steps. Any show registration fees will be refunded. Those who planned to attend will need to cancel any hotel reservations on their own.

“We had exciting plans for the 2020 show and will work hard to make the 2021 show even more exciting and useful,” OAN Director of Events Allan Niemi said. “We have a feeling that people will be more than ready to get together, do business, learn together and celebrate a



More COVID-19 coverage online

Further updates on how the COVID-19 virus is impacting the greenhouse and nursery industry is online at www.diggermagazine.com/category/coronavirus. We are reporting on the most current information as of press time, but please check online for the most up to date information.



OAN President Jim Simnitt talks about the impact the COVID-19 pandemic has had on nurseries. PHOTO COURTESY OF KOIN

renewal of the industry's success.”

Farwest was founded in 1973 and has run annually since then. It is the largest green industry trade show on the West Coast and is hosted in Oregon, where nurseries and greenhouses are the #1 agricultural sector in the state by annual sales. It attracts around 5,000 professionals and 400 exhibitors each year, including nursery and greenhouse operators, nursery industry suppliers, landscaping professionals, service providers, researchers, students and others.

Oregon's \$1 billion nursery and greenhouse industry leads the nation in production of coniferous evergreens, deciduous shade trees, deciduous flowering trees and cut Christmas trees, according to USDA statistics. The state is #1 in bareroot nursery products, #1 in ball and burlap nursery products, and #3 in containerized nursery products.



KOIN-6 REPORTS ON COVID-19 AND THE NURSERY INDUSTRY

The COVID-19 pandemic hit the Oregon nursery industry at the worst time of year, when most product is shipped to nationwide markets, KOIN-6 News (Portland, Oregon) reported.

Oregon Association of Nurseries (OAN) President **Jim Simnitt** went on camera at his nursery, **Simnitt Nursery** in Canby, Oregon with OAN Executive

Director **Jeff Stone** also being interviewed. “Spring is when everybody’s gardening,” Simnitt said. “This is when we’re shipping a lot of our material out to garden centers and so it’s probably the worst time it probably could have happened.”

An OAN survey indicated that 98% of members have remained operational during the pandemic, but Stone cautioned against too much optimism.

“[We are] open now,” Stone said. >>



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“This community is resilient. They survived the Great Recession, but let’s not put sugar-coating on the Great Recession. We lost a third of the nursery operations in the state.”

Navigating different sets of rules in different states and localities has posed a major difficulty for the industry. Stone helped the Nursery and Landscape Association Executives of North America (NLAE) put together a nationwide map showing which industry segments are open or closed in each state and Canadian province, along with links to other helpful coronavirus-related resources in each state. Watch the segment online at tinyurl.com/ycb2yk99.

OREGON OSHA IMPLEMENTS RULES IN RESPONSE TO COVID

Oregon Occupational Safety and Health Administration (Oregon OSHA)

announced new temporary regulations intended to protect agricultural workers against possible exposure to the COVID-19 pathogen as farms statewide continue to operate.

The regulations, collectively known as the “temporary rule,” were announced April 28 and were scheduled to take effect on May 11. Officials then announced on May 11 that rule enforcement would be postponed until June 1, giving growers more time to meet the requirements.

The Oregon Association of Nurseries (OAN) and other groups found the rules too inflexible. They asked the agency to provide more flexibility and take into account the many different types of agricultural production and specialty crops that exist within the state of Oregon.

“Growers want to do what’s right for

workers, but the requirements need to be practical and reasonable,” OAN Executive Director Jeff Stone said. “The delay in enforcement is a good sign and will allow everyone time to work out details. We will continue a constructive ongoing dialogue between agricultural groups and Oregon OSHA, so that workers are protected, and growers get enough flexibility to do what actually works.”

Some of the new requirements are as follows.

Sanitation. Farm employers must provide one toilet and one handwashing facility for every 10 employees in the field, up from one for every 20. These must be located no more than ¼ mile away from any employee’s work location in the field. The facilities must be sanitized three times per day.



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Agricultural groups mentioned that workers may be kept too far apart in the field to make the ¼-mile radius practical.

Transportation. Employers must separate all employees by three feet, minimum, when driving them in company vehicles, and all must wear facial coverings. The vehicles must be sanitized before and after use.

Housing. All beds must be six feet apart, and no bunk beds are allowed unless the people using them are related. The housing facilities must be cleaned and sanitized regularly. Agricultural groups objected that the rules could cut housing capacity in half and make it more difficult to shelter everyone.

OSHA did offer some flexibility on this, allowing beds to be placed in what would otherwise be commons rooms, as long as exit routes are not obstructed, and beds are not placed in close proximity to

cooking areas.

Officials said workers could be housed at hotels or motels, many of which have been closed due to a severe downturn in travel, as long as those are in a condition that could be rented to the general public. Workers also could be housed in recreational vehicles or travel trailers, as long as the capacity isn't exceeded and only related individuals reside in any one unit.

The **Oregon Farm Bureau** (OFB), OAN and other agricultural groups surveyed their members to determine the possible impact and expense of the regulations.

The results showed that the rules would impose significant expense on growers. Most said they would need to provide between 1-4 new toilets and handwashing facilities, which cost up to \$5,000 to purchase. More than half said they would expect to spend between \$50-\$500 cleaning them.

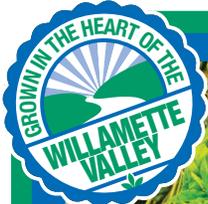
Additionally, the survey estimated that nearly 5,000 employees could be displaced from their housing due to the new rules.

OAN, OFB and others have asked the State of Oregon to provide assistance to help farmers cover the added cost of protecting workers.

SUPREME COURT RULES ON GROUNDWATER POLLUTION

The U.S. Supreme Court has ruled on a Clean Water Act case with significant ramifications for agriculture, the *Capital Press* (Salem, Oregon) newspaper reported.

On a 6-3 ruling, the high court rejected a 9th U.S. Circuit Court of Appeals ruling that held facilities liable if the pollution was "fairly traceable" through groundwater to an operation. However, groundwater will still be regulated as a possible conduit for >>



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unlawful pollution. Farm organizations had hoped the high court would clearly state that groundwater can't serve as a "pipe" for pollution to other waterways, legally speaking. Read more online at tinyurl.com/yctr177p.

FARM EQUIPMENT SALES FALL DURING PANDEMIC

Sales figures from March by the Association of Equipment Manufactures have plunged according to a report by *Capital Press* (Salem, Oregon). Compared to this time last year, farm tractor sales are down 15%, and overall combined sales by volume is down 12%.

A small bounce in data is not enough to suggest a long-term change in the industry. Changes in buyer behavior suggest the COVID-19 pandemic is persuading farmers to hold off on buying new farm machinery. Shifts in crop demand across many market segments also may be a factor. Read the full story at tinyurl.com/yd4utakm.

Announcements
NEW EARLY DETECTION POSTER FOR SPOTTED LANTERNFLY

Oregon State University (OSU) Plant Clinic has published an informative poster to help growers identify the invasive spotted lanternfly (*Lycorma delicatula*). It shows images of the pests throughout their lifecycle.



Dead spotted lanternflies from Pennsylvania were found on cargo in California last year, but there is no official report of a living West Coast living infestation yet. The insects are drawn to grapevines, but it are also damaging to fruit trees and other landscape plants. The clinic's website also offers a resource page that provides growers with early detection tools and contact information for the OSU Insect ID Clinic.

Download a printable file of the poster at tinyurl.com/yb5kkn5c.

Seeding the need to garden

NOTHING ABOUT THE SPRING 2020 garden season has been ordinary. From March onward, the COVID-19 pandemic has impacted many facets of the garden industry in ways no one could have predicted.

Six months ago, if you had described a scene where shoppers and workers were wearing masks and standing six feet apart, no one would have believed it. No one would have predicted the newfound prevalence of online or telephone ordering at garden centers, or the occurrence of product outages. The list goes on.

Many garden centers have overcome extraordinary obstacles to stay open. The typical garden center was never designed to take online orders and to have customers drive up for their merchandise to be loaded into their vehicles.

Nurseries nationwide encountered confusion and uncertainty. In some states, the green industry was shut down either partially or entirely. In Oregon, Gov. Kate Brown's executive order shut down many businesses, but nurseries were not among them. However, there were new protocols all businesses had to follow — nurseries included.

Different businesses adapted to the challenge in different ways. For example, the five-acre **Portland Nursery** (Portland, Oregon) closed for two weeks in March to rearrange its environment and make it safe and legal to open.

Measures taken included limiting the number of customers allowed in the nursery at any one time to 30 people, closing the indoor portion of the store so all business is conducted outside, rearranging layouts for social distancing, setting up plexiglass barriers between cashiers and customers, and eliminating

the use of cash — all transactions had to be either credit or debit.

The seeds of uncertainty

With all of this going on around me, I had not stopped to consider that vegetable seeds might become more difficult to obtain. I got a reality jolt one morning when I opened a message from High Mowing Organic Seeds, a large seed company in Vermont that sells seeds to growers as well as home gardeners.

The message said that because of record-breaking orders, the company had to make some tough decisions. It would stop accepting new orders from home gardeners from April 11–28, and also would not take website orders during that time.

To me, this decision — coming during the peak vegetable planting season — was almost unheard of. Wanting to get a more local perspective on this issue, I contacted Mike Dunton from Victory Seed Company in Molalla, Oregon. He reported that they too had stopped accepting new orders in April. They simply could not keep up with the demand. Even though employees were working almost around the clock to fill orders, seven days a week, they were still behind with shipping.

Mike believes that the supply chain disruption due to COVID-19 has people looking for greater food security. They want to know where their vegetables are coming from, and they want a reliable supply. If there ever was a time people wanted to sow a Victory Garden, it is now!

Retailers adapt

I contacted several local garden centers to get a perspective on changes they have made with respect to the COVID-19 pandemic. I particularly



Mike Darcy

Head “plant nerd,” longtime speaker, host of gardening shows on radio and TV, and author of the *In the Garden* email newsletter.

You can reach Mike, or subscribe to his newsletter, at itmikedarcy@comcast.net.

was curious if the vegetable seed sales increases were, in fact, carrying over from the grower to the retailer.

I asked Portland Nursery General Manager Suzy Hancock about vegetable seed sales and she said they were selling like “hotcakes.” Suzy said that the nursery owner, Jon Denney, was evidently looking into his crystal ball earlier this spring and thought that there might be a big increase in the demand for vegetable seeds. He told the buyers to double what they had ordered last year, which they did, but it wasn't nearly enough.

Many vegetable varieties sold out early, and getting reorders has been difficult, or in some cases, impossible.

Because of COVID-19, the nursery changed the location of its seed racks and how the seeds are sold. Since the seed racks were located in the indoor area that is now closed, they were moved to a location just inside one of the warehouse doors. The store needed to limit hand contact between customers and the seed packets, so they set up tables in front of the racks to prevent access. Instead of picking through a seed rack by hand, customers must ask a salesperson to retrieve the desired packets.

In spite of these barriers, vegetable seed sales increased.

Along with that, there has also been a big demand for raised bed kits and soil.

With a smaller footprint, Garden Fever — another Portland, Oregon garden center — has closed its retail store and with it, the outside nursery area. With their limited >>





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WHAT I'M HEARING

Previous page: A vegetable seed rack at Wilco in Lake Oswego stands nearly empty.
PHOTO BY RICH BAER

physical space, it was too difficult to try to maintain a six-foot social distance between customers, co-owner Lori Vollmer said.

The retailer is now selling electronically, either by email or with Excel order sheets from their website. The customer is then called to acknowledge that the order is ready, and the payment and pick up process is explained.

Lori said that vegetable seed sales have “gone through the roof” and they are often unable to get reorders.

She also said that they have seen an increase in raised bed kits and that garden soil sales have increased dramatically. Garden Fever has always had a good selection of puzzles and Lori said that sales of puzzles have also increased dramatically.

Parking was already limited due to Garden Fever’s urban location. Customer pickups are proving to be even more challenging. Although the nursery was never designed for on-line orders and pickups, the nursery stepped up to meet the challenge and it is working. I commend them for that.

I did smile when I read on their website, “Closed Monday and Tuesday — staff health and sanity days!” Those are probably very well deserved.

Finding a way

I believe that gardeners are very innovative. Despite obstacles that might occur, they will find a way to plant their vegetables, flowers, shrubs and trees. Especially in these troubling times, my garden is where I go to relieve some stress and enjoy the beauty surrounding me.

To make it convenient for gardeners to know what garden centers are open, what services are offered, and what restrictions they might have, the Oregon Association of Nurseries has created a Safer Shopping page listing 61 retail locations and counting. For up to date information, go to www.PlantSomethingOregon.com/coronavirus.

This only goes to prove that no matter what you do, you cannot “mask” the ability of garden centers to creatively meet the challenges that they encounter. ©

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MEET THE LEADER

The voices of Oregon's nursery industry

TELL US ABOUT YOURSELF

My dream ever since I was little was to manage the nursery. When I was 8, I started pruning trees to earn a pair of rollerblades. Throughout high school, I worked in propagation on my family's nursery ... in 6 feet of snow, uphill both ways, of course! After high school graduation, I spent two years working every job in the nursery. Following a two-year internship, my parents approached me to let me know in order to fulfill my dream and manage the nursery, I would need to get a business degree. I graduated from Linfield College in 2008 and found my home in the nursery industry. I fell in love with the plants and the people. I have been blessed with great learning opportunities with some of the best growers in the world. I am proud to have this in my blood. I was born to do this.

WHAT'S YOUR GUIDING PRINCIPLE?

Do the right thing — every time.

WHAT'S THE BEST BUSINESS DECISION YOU'VE EVER MADE?

Well, the best business decision I ever made was joining the family business, but a close second would be the decision to start a Lean transformation at Robinson Nursery Inc.

WHO IS YOUR MOST SIGNIFICANT MENTOR?

I have a few mentors for different things — my mom, my brother, my wife, and a few close colleagues — but my dad is the most significant one. His commitment to discipline and hard work is beyond anyone I've ever seen, and yet he still knows how to truly live. He has an insatiable thirst for growth; this man has no ceiling. My dad taught me that the most valuable return on investment has nothing to do with the money. He also taught me how to ethically run a business, how community is global, and the importance of cultivating a meaningful life. Most importantly, he taught me to marry above my pay grade.

BEST BUSINESS ADVICE:

Grow the number of trees you are going to sell.



Chris Robinson
Nursery Manager
Robinson Nursery Inc.
OAN member since 1987

- Field/Bare Root representative, OAN Board of Directors
- Sunset Chapter President
- Research Committee member
- New Nursery Professional of the Year (2017)

WHAT DO YOU LOVE MOST ABOUT THE NURSERY INDUSTRY?

I love the people. When my brother Josh and I first entered the industry, it was during a recession, so we took a lot of field trips to other growing operations. It didn't matter if it was a customer or a competitor or not — we were welcomed with open arms. It was almost like everyone was rooting for us from the start. It felt like home.

WHAT MOTIVATES YOU TO GO TO WORK EVERY DAY?

Many things drive my passion for nursery work. Progression. The pursuit of perfection. Research and development. Changing the game. I honestly just want to create a better tree while continuing to add value to our products.

WHAT ARE YOU MOST PROUD OF?

I'm proud of the team at Robinson Nursery. I'm proud of my family's ability to work together to grow our business. I'm proud of our managers and supervisors for continually pushing progression. I'm proud of the younger generations who are stepping up to follow in the footsteps of their mothers and fathers. And, I am proud of all our team members that devote their lives to creating a product that changes the world for the better.

WHAT ARE THE BENEFITS OF BEING INVOLVED WITH THE OREGON ASSOCIATION OF NURSERIES?

The nursery industry has given me a lot. I believe in what the OAN is doing. They really have our backs. One small example of their dedication to us all is the way they have fought tirelessly for our industry throughout the COVID-19 pandemic. That is just one of many ways they help keep our industry alive.

What a person puts into the OAN they receive back ten-fold. If you ever have the opportunity to serve on an OAN committee or the board, you will find yourself sitting next to knowledgeable and passionate leaders of their field. The networking alone will accelerate your personal and professional growth, but you also become a part of something bigger. Through the OAN, I have an amazing opportunity to contribute to the success of the entire Oregon nursery industry.

IN YOUR OPINION, WHAT ARE THE MOST CRITICAL CHALLENGES FACING THE NURSERY INDUSTRY TODAY?

For our industry, uncertainty is a constant challenge. We fight extreme variables annually and it inevitably ends in feast or famine. In the wake of the pandemic, we feel that the stress is amplified. We are going to need to learn to pivot. Our 3–5-year plans, pre- and post-COVID-19, are going to look completely different. ©

Kip Nordstrom, garden designer and owner of Hearth n' Soul (Lake Oswego, Oregon), incorporates certain woody ornamentals for their white blooms. PHOTO COURTESY OF HEARTH N' SOUL

PART 2 OF 2

Visions of white: A series on white blooming plants

April: Perennials, groundcovers, bulbs, vines, edibles and hydrangeas

This month: Woody trees and shrubs

White and woody

This palette of white-blooming trees and shrubs provides strong design options

BY TRACY ILENE MILLER

WHITE BLOOMING PLANTS can provide balance in the garden or landscape, and landscape designers' plans.

"I do find clients who have an approach of a modern or more formalistic garden, that tend to go for white [blooming plants]," said Roxy Olsson, a landscape designer at **Farmington Gardens** (Beaverton, Oregon). "They'll say, 'I want modern with white blooming hydrangea,' or 'I like white and black,' or 'I like these colors, and white will be one of them.'"

White blooming plants can also be planted for a spiritual or mystical sensibility to the garden, and even as a focal point in a gathering of containers, said Kip Nordstrom, garden designer and owner of **Hearth n' Soul** (Lake Oswego, Oregon).

There are so many valuable selections of white-blooming plants, from annuals to vines and even trees. In Part 1 of this series (see *Digger*, April 2020), the focus was on tender plants and hydrangeas. Here, in Part 2, we continue the exploration of top-quality plants named by growers and designers as strong selections, this time focusing on woody plants.

Camellia and Gardenia

"There are so many white flowering camellias that people don't know about that are just easier than *Camellia japonica*," said Brie Arthur, garden designer, horticulturist and author out of Raleigh-Durham, North Carolina. There are varieties and species that show brilliant white blooms from September to the end of May.

C. japonica 'Sea Foam' is one of her favorites — a vigorous grower to 6–8 feet by 5–6 feet with pure white double flowers in winter through spring, paired with contrasting large deep-green leaves. Another vigorous grower, *C. oleifera* (tea-oil camellia)

is a fall bloomer, but it comes from high elevations, so it is reliably hardy to USDA Hardiness Zone 6a. It has incredible fragrance and a 20-foot by 10-foot habit.

One of Arthur's favorite white-blooming plants is an "older gem," *Gardenia jasminoides* 'Michael'. At 5 feet tall, it never needs pruning. It's a completely reliable plant that she laments has been overlooked by a nursery industry focused on introducing smaller jasmine that are ill-suited to survive fluctuating climate conditions.

Nordstrom specifically installs the 9-foot by 9-foot evergreen *Camellia sasanqua* 'Setsugekka' close to houses, as a foundation plant, for the show it provides in winter when the garden is quieter. But, this plant is suffused with semi-double, ruffled flowers with bright golden stamens.

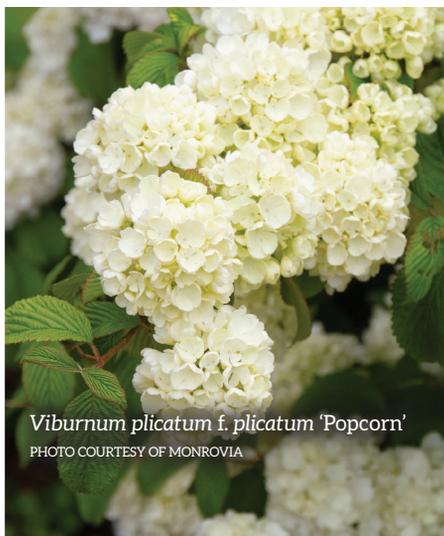
Viburnum

Arthur could recommend so many viburnum, but if she had to live with only two, the first would be *Viburnum plicatum* f. *plicatum* 'Popcorn' (Japanese snowball), and the second would be *V. bitchiuense* (Bitchiu viburnum).

'Popcorn' is another oldie-but-goody, according to Arthur. A slower grower, by 10 years old it has only reached 6-foot by 4-foot in her yard. It needs no pruning and no water once established. "It has big white flowers — a reliable bloomer — that are appropriate to the stature of the plant," she said.

The lesser-known species *V. bitchiuense* is beautiful in early spring and has a dark burgundy fall color. As partly deciduous, it doesn't drop its leaves until the new foliage grows.

"This is one of those plants that I don't have to do anything to and looks good year-



Viburnum plicatum f. *plicatum* 'Popcorn'
PHOTO COURTESY OF MONROVIA



Viburnum plicatum f. tomentosum
'Summer Snowflake' PHOTO BY KIP NORDSTROM



Detailed of 'Summer Snowflake' PHOTO
COURTESY OF MONROVIA



Cornus 'Kn30 8' VENUS® PHOTO COURTESY
OF MONROVIA

round,” Arthur said. “It has a tight growing habit, doesn’t need watering once established and is good for property borders [because of its size].”

For years, a staple in Nordstrom’s designs was *V. plicatum f. tomentosum* ‘Summer Snowflake’. With its 15-foot mature height, it can be trained like a small tree for a small space. “It blooms profusely in spring, and will throw additional flowers in summer, although not as profusely,” she said.

Trees

“Trees can get big, even a small one is 30 feet,” Nordstrom said. So usually, if she wants something smaller, she uses shrubs and trains them into a small tree. But she makes an exception for *Stewartia pseudocamellia* (Japanese stewartia), a **Great Plant Pick**. It is one of her favorite trees for all of its four-

season interest; including cup-shaped white flowers, fall-colored leaves, winter seeds, decorative branching and a patchwork bark of pinks, reds, greens and grays.

“[The bark] is like the finest of fabrics,” said P. Annie Kirk, owner and landscape designer at Red Bird Restorative Gardens (Woodburn, Oregon).

According to Arthur, the evergreen 20-foot *Magnolia grandiflora* ‘Kay Parris’ is like *M. grandiflora* ‘TMGH’ (Alta® southern magnolia), but with an improved growing habit. “So it’s appropriate for street trees and small neighborhood lots,” she said. It is especially good for a mixed property border paired with, for instance, *Thuja* and *Viburnum*.

Nordstrom recommends *M. grandiflora* ‘Little Gem’, one of the smallest magnolia varieties for its fragrant 4-inch flowers that provides a big display in

spring. She also gives *Prunus serrulata* ‘Mt Fuji’ center stage in her landscape designs because it presents a spectacular flower display in spring, when the semi-double flowers cover the branches of the umbrella-shaped 20-foot by 25-foot tree.

Lastly, she recommends the 15-20 foot *Cornus* ‘Kn30 8’ VENUS® (*Cornus kousa* ‘Chinensis’ × *Cornus nuttallii* ‘Goldspot’ × *Cornus kousa* ‘Rosea’) with its giant 6-inch flowers that takes 20 years to reach a mature size.

Olsson explains that Farmington Gardens puts out rows of VENUS, and when people walk through the nursery, and customers put their hands up to compare the size with the large blooms. VENUS can compete for showiness with magnolia as a centerpiece and within 10 years it only gets 20–25 feet and is bigger and more rounded as the canopy fills out. ➤➤



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White and woody

Fothergilla gardenii
PHOTO COURTESY OF WIKIMEDIA



Ribes sanguineum 'Oregon Snowflake'
PHOTO COURTESY OF BLOOMING NURSERY



Salvia apiana
PHOTO COURTESY OF BLOOMING NURSERY

Notable high drought tolerance

Grace Dinsdale, founder and manager at **Blooming Nursery** (Cornelius, Oregon), has planted *Salvia apiana* (white sage) in a few places and never watered it. “They get quite big, 7–8 feet with the bloom,” she said. The bush is about 4–5 feet tall. “It’s happiest in a high drought situation,” and even works at the seaside where there are salty sprays.

Ribes sanguineum ‘Oregon Snowflake’ (white flowering currant), developed recently by Ryan Contreras at **Oregon State University**, is 4–5 feet tall with pendulous white flowers. “Lots of them, just covered [with flowers],” she said. It blooms for a long period, late winter through spring, and is very drought tolerant and white. Plus, hummingbirds are attracted to it.

Convolvulus cneorum (silverbush) thrives with little water. Otherwise, it is vulnerable to stem rot. The combination

of silvery foliage and white flowers — with a rose reverse on the petals — forms 1–2-foot mounding bushes with blooms from late spring through summer, according to Dinsdale. It works in containers and attracts pollinators.

Shrubs

“People don’t think about azalea and fragrance,” Olsson said. But, *Azalea* ‘Fragrant Star’ (deciduous azalea) is highly fragrant with blooms clustered to create a pompon effect. It is shade-tolerant and good

for entryways and darker spaces. An East Coast native, *Fothergilla gardenii* (dwarf fothergilla) has bottle brush-type, exploding blooms on bare stems when the leaves are starting to bloom. “It’s good for a part-shade environment and is typically found in coniferous forests, so can pair well with old growth,” Olsson said. Besides its dwarf 34- to 36-inch size, the leaves have a blue sheen and turn colors in fall.

Another East Coast native, the 3–4 feet tall *Philadelphus × virginialis* ‘Miniature Snowflake’ (dwarf Eastern mock orange), has multilayered blooms that start out as showy white buds with no green bract, that add color and texture. “The buds look like polka dots before the flowers, which are really fragrant,” Olsson said. The drought-tolerant, sun-loving shrub can be more in the background or combined with evergreen, conifers or shrubs like evergreen huckleberry.



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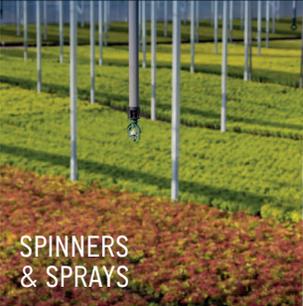
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Clethra alnifolia 'Hummingbird'
PHOTO COURTESY OF WIKIMEDIA

Rosa rugosa 'Blanc Double de Coubert' (rugosa rose) is fragrant, naturalistic and produces more of a thicket, which is great for beds, "They have an amazing seasonal interest," Olsson said. Usually blooming through late fall, it provides fall color and then red rose hips in winter. They are multifunctional, with flowers that can be used for potpourri and rose hips for simple syrup. *Clethra alnifolia* 'Hummingbird' (sweet pepperbush), at 4–5 feet, stays small and has "beautifully spired white blooms and can be used as background plant with conifers," Olsson said. It's fragrant, attracts pollinators, and in fall turns a vivid yellow. "Combining that with a rounded or upright spruce captures a more Rocky Mountain feel," Olsson said, "giving more of natural look." As it ages, the bark can be smooth even in the wintertime.

'Hummingbird' is also one of



Osmanthus delavayi
PHOTO COURTESY OF MONROVIA

Nordstrom's all-time favorites. For outstanding fragrance, she also uses *Philadelphus* 'Belle Etoile' (Mock Orange) for its compact 5–6-foot size and abundance of flowers in midsummer.

A little larger, *Arbutus unedo* 'Compacta' (dwarf strawberry tree) has been a go-to choice for her when it is trained as a small tree. Periodically, she needs to get a new one because it gets overwatered. But for its size — maturing at 10 feet — and four-season interest, it is multifunctional in the garden.



Detail of *Osmanthus delavayi*
PHOTO COURTESY OF MONROVIA

Closer to the ground, she uses *Rosa* 'Flower Carpet White', which she can keep a tidy 2–3 feet tall without a lot of work. "If I want a rose on a bank, I use this," she said.

And for shade, the evergreen 4–6 feet *Loropetalum chinense* 'Emerald Snow' (Chinese fringe flower) has the solid structural element she likes to build designs, with the bonus of heavy blooming in spring and continued sporadic blooms during summer.

Three more recently-added plants to her list of favorite white bloomers include *Osmanthus delavayi* (Delavey osmanthus), a 6–8-foot evergreen shrub with slim, arching branches and blooms from winter to spring bloomer; *Deutzia gracilis* 'Duncan' (Chardonnay Pearls®), which brightens with its chartreuse foliage once the blooms have faded in spring; and the dwarf and fragrant *D. gracilis* 'Nikko' (Slender Deutzia). ➤



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White and woody

Philadelphus × *virginalis* 'Miniature Snowflake' PHOTO COURTESY OF ROXY OLSSON

"I do adore white *astilbe* in a dark and shady grotto," said Kirk. "It looks like lightbulbs, with a Dr. Seuss quality." She names 30-inch *Astilbe arendsii* 'Bridal Veil' (Bridal Veil false spirea) for its pure white color. "I'm a snob about pure white," Kirk said. "For me, it's an incredibly powerful color."

The ruggedness of the newer 8–10 foot *Loropetalum chinense* 'Snow Panda' (Chinese fringe flower) also appeals, especially contrasting with its delicate flower, according to Kirk. *Philadelphus lewisii* (Lewis' mock-orange) — which she just transplanted two from an old to a new garden — and (*Philadelphus* × *virginalis* 'Miniature Snowflake') are fragrant and not fussy like gardenia. They have a taller stature and a lovely sophisticated flower head.

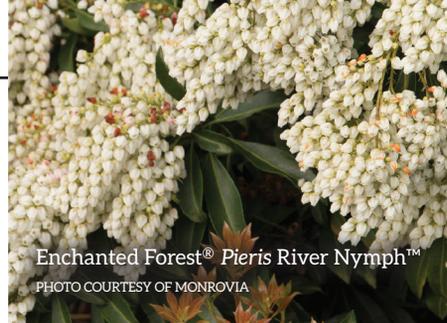
For around the patio, Justin Hancock, senior director of marketing at **Monrovia**



Jasminum sambac 'Monhariklia'
PHOTO COURTESY OF MONROVIA

Nursery Company (Dayton, Oregon) recommends the tropical *Jasminum sambac* 'Monhariklia' (Summer Soul® Arabian jasmine). It has incredibly fragrant double flowers and if kept watered and fertilized, it will bloom all summer long. Bring it in the winter and make jasmine tea from it!

Prunus laurocerasus 'Chestnut Hill' (Chesnut Hill cherry laurel) only gets to 4 feet tall and wide, Hancock said. It is a workhorse shrub that includes fragrant spring flowers. "Cherry laurel falls into the gas station category, it's so easy to grow."



Enchanted Forest® *Pieris River Nymph*™
PHOTO COURTESY OF MONROVIA

Also with fragrance, *Abelia grandiflora* 'Lucky Lots' is evergreen, with variegated foliage and a tidy 2½-foot-tall habit. "You can tuck it into any sunny spot, it is good for pollinators and once established, has pretty good drought tolerance," Hancock said.

For brightening shady areas, *Pieris japonica* 'River Run' (Enchanted Forest® *Pieris River Nymph*™) produces a "crazy number of flowers," Hancock said. It also lasts longer compared with other *Pieris*, on a 5½-by-5½-foot plant.

For all situations, moist or dry, sun or shade, tall or short, there is a white blooming plant to balance and contrast with other plants in the landscape or garden. ☺

Tracy Ilene Miller is a freelance writer and editor who covers several topics, including gardening. She can be reached at tracyilenemiller@gmail.com.

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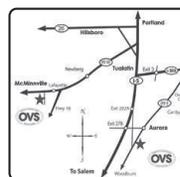
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COVID-19 has resulted in the need to protect workers as they're being transported as well as in the field. When workers can't be spaced out, many growers have put up barriers to prevent the spread of pathogens, including J. Frank Schmidt & Son Co.

PHOTO COURTESY OF J. FRANK SCHMIDT & SON CO.

Growing in a new way

Nurseries modify processes on the fly to protect their workers from COVID-19

BY CURT KIPP

CCOVID-19 CREATED a game-changing societal threat — a deadly pathogen that can spread easily for up to 14 days without the carriers showing symptoms.

Nurseries and greenhouses responded quickly by implementing social distancing to prevent transmission. They looked at every facet of their operations, from propagation to field work to the loading dock, and made adjustments. Time clocks, lunch routines and bathroom breaks changed as well.

“The biggest thing we’ve had to change is our mindset,” said Tyler Kuenzi, general manager at **Kuenzi Turf & Nursery**, a specimen tree, liner and turf grower in Salem, Oregon. “We’ve gone from status quo, things looking consistent, to having to change.”

Doing that requires a team effort across the entire organization.

“I think our supervisors have done a really good job, and our employees, of taking it seriously and maintaining that distance,” said Chris Ames, director of operations at wholesale grower **Kraemer’s Nursery Inc.** in Mt. Angel, Oregon. “Every time we find something we need to address, we sit down and discuss it as a group, and we get the people involved in doing the job involved in discussing the ways to do it differently.”

That’s likewise true at **J. Frank Schmidt & Son Co.**, wholesale tree grower based in Boring, Oregon.

“We’re just trying to be really supportive and understanding,” recently-hired CEO Ben Rough said. “People are coming up with some great ideas from the internal part of the organization, trying to say ‘what about this’ or ‘what about that.’ We encourage people to come up with ideas and we can implement those safe practices.”

Robinson Nursery Inc., a liner grower in Dayton, Oregon, has taken its responsibility to workers seriously.

“We want to do everything we can to not get the virus in our company, so if we’re given suggestions, if we can easily accommodate them, we want to do them,” general manager Chris Robinson said. “It’s not just our team members. We’re responsible for them taking something home to their families, so we want to keep everyone safe. There’s a lot riding on this.”

Monitoring the workplace

Oregon’s “stay-at-home” executive order requires that each business choosing to operate must appoint a safety liaison to monitor compliance and watch for situations that need to be addressed. Ames referred to this as having a “policeman of the nursery” — someone to be visible and provide reminders.

“We’ve done as much educating as we possibly can,” she said. “We’ve done a lot more communicating with employees than ever before.”

But the communication runs two ways, and employees have raised questions or ideas of their own. “We’ve addressed employees’ concerns as quickly as we possibly can,” Ames said.

At **A&R Spada Farms**, a woody ornamentals grower in St. Paul, Oregon, the communication with workers is constant. “We even have six-foot sticks that we walk around with and remind our crews that this is how long six feet is,” sales manager Vinny Grasso said.

Robinson Nursery has two social distance officers. One is dedicated strictly to the H-2A guest workers, about half of whom live on site. The worker housing comes its own guidelines for the dwellings, but Robinson has been able to space everyone out as required.

Along with worker education comes personal protective equipment (PPE), which is provided by Kraemer’s and other growers.

“Masks are hard to come by, but we did buy our employees bandanas, and we have a number of employees making masks,” Ames said. “We have been handing those out if we see someone doesn’t have something. We’ve been trying to add PPE as much as we possibly can.”

Robinson provides its employees with a new mask every two weeks that they can take home and wash.

Adjusting the processes

Process adjustments at nurseries have covered everything that happens during the day, from clocking in, to breaks and lunches, to the various production tasks that take place on a nursery, and onward until the day is done.



Growing in a new way

Bailey Nurseries added partitions at its tagging tables for container shipping, as both a reminder and as a physical barrier. A roof was added to keep the rain off, as well.

PHOTO COURTESY OF BAILEY



At J. Frank Schmidt, the time clock procedures were entirely changed.

“Workers used to hand punch a card,” Rough said. “Now they swipe a card, and when they swipe in, they have to be six feet apart.”

Schmidt is also keeping worker groups isolated from each other.

“We have multiple farms and do not labor share between the farms,” Rough said. “We keep the same groups together all the time and don’t intermix groups of people.”

To further reduce the number of workers that are exposed to each other, **Bailey** and other growers are staggering shifts, breaks and lunches. “We’ve staggered all our schedules, so you don’t have people taking breaks and lunch at the same time,” said Shane Brockshus, Bailey’s manager of West Coast operations.

Kraemer’s has staggered shifts, put in

more handwashing areas and created portable lunch areas in the field. “We’ve also asked people to eat in their cars, and many are,” Ames said. “They must keep their lunches with them all the time when they’re moving through the nursery.”

On the job, efforts are undertaken to move workers further apart.

Some of these jobs, such as field work, have a natural degree of social distancing built in.

“Fields have been easy,” Robinson said. “Row spacing is 50 inches. If we have people working every other row, they’re 100 inches apart.”

Likewise at Kuenzi Turf & Nursery.

Only slight modification was required.

“Our rows are five feet apart, so when we’re having the crew put rods in [to stake trees], we know they’re going to be five feet apart,” Kuenzi said. “If we have them a foot ahead in the rows, then we know we’ve got that distance.”

For other jobs, processes were modified more extensively to ensure distancing.

At Robinson Nursery, major modifications were made to propagation procedures.

“Our typical spacing is usually three or four feet,” Robinson said. “In our propagation planting line, we added an extra conveyor and we spaced people out, so that everyone could maintain their >>



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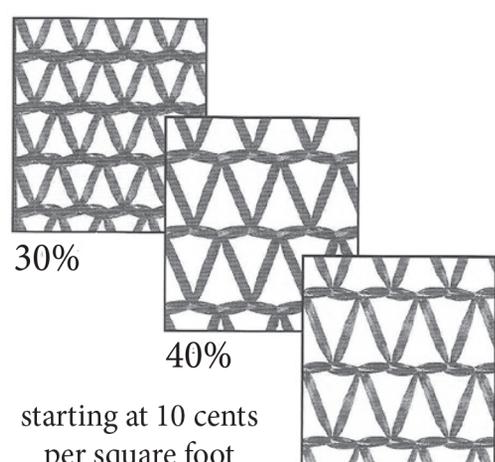
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six feet of separation.”

Robinson also added conveyors to its three-gallon potting line to space people out. As a Lean nursery, the grower typically avoids unnecessary transportation of product, but this is necessary. “It’s a little less efficient, but it allows us to keep the distance,” Robinson said.

Bailey, likewise, has pulled people off of planting or container lines in order to space them out, and has run the lines shorter if that is what is needed. In areas where there is more possibility of people interacting, the company has installed physical barriers.

Robinson has also installed barriers on any machinery that takes more than one person to operate. Examples include field machinery for trimming or planting.

Moving products, not pathogens

Arriving and departing freight trucks and their drivers represent another possible avenue of exposure. At Spada Farms, drivers used to walk into an office and get checked in. No more.

“The office is locked — we don’t have any external traffic coming inside,” Grasso said. “We built a window platform so they’re still six feet away from the window to check in drivers.”

At J. Frank Schmidt, arriving drivers must remain in their vehicles and call in by phone upon arrival. They’re then directed where they need to go.

Growers that operate their own delivery trucks must concern themselves with what happens off site. Kraemer’s outfitted drivers

with kits to keep themselves safe, containing PPE and disinfectant.

Back on the dock, employees must build loads and prepare them for shipping. Growers have modified procedures there, as well, to prevent transmission opportunities.

Kraemer’s is racking plant material before it is loaded, because there is not enough space in the backs of trucks to allow for proper social distancing.

Bailey installed partitions at its tagging tables, where containerized plants receive labels just prior to going on the truck. They provide a physical barrier and remind workers to stay distanced.

A victory every week

Dealing with COVID-19 has challenged nurseries like never before. They are forced to take greater precautions, modify their processes on the fly, trade off efficiency to make worker protection the priority, manage worker communication and morale, and do all this so they can sell into a struggling economy, with markets that are uncertain at best.

“I just keep saying that I really feel like every week’s a victory right now,” Brockshus said. “Every week that we get through and keep our employees healthy and our customers healthy, and we’re able to ship product out, every week is a victory.” ☺

Curt Kipp is the director of publications and communications at the Oregon Association of Nurseries, and the editor of Digger magazine.



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- Nursery management: 7 years + experience
- Language: Spanish & English
- Compensation & Benefits dependent on experience

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EMPLOYMENT

PRODUCTION MANAGER/ GROWER

Production Manager needed for field grown Japanese Maple nursery. Don Schmidt Nursery is an established name in the industry with a solid reputation for quality and specimen sizes. Located 45 minutes east of Portland, the nursery has 165 acres of production year-round.

We are looking for someone experienced with field grown nursery stock production on a commercial scale to join our team.

Essential Functions:

Lead crews with digging and trimming practices; Coordinate and execute safety compliance; Assist customers with orders; Maintain inventory, production, and shipping schedules.

Required Skills:

Bilingual in Spanish and English; Valid driver's license and good driving record; Currently have or willing to get pesticide license; Basic computer skills (Microsoft Office); Excellent customer service; Passion for plants.

This position will train along with our current manager with 30+ years of experience during a handover period. This is a full-time, year-round position. Salary is based on experience and a vehicle is provided. Company has paid vacation and sick time.

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EMPLOYMENT

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Wholesale deciduous tree nursery located in Milton-Freewater, OR is seeking a full-time grower with experience in tree production. Applicant must be fluent in Spanish and English, both reading and writing, and have proven supervisory/management skills.

Ideal candidate will be self-motivated and quality-driven, be honest, a team player, trustworthy and possess a high work ethic standard. Five plus years of horticultural education and/or work-related experience is preferred. Valid driver's license required.

Moving and/or housing assistance may be available. Wage DOE with full company benefits.

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EMPLOYMENT

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A strong horticultural and plant identification background with technical knowledge of landscape materials is required. Applicant should have a good industry network and solid relationships with qualified suppliers that provide a variety of quality material at value-added prices. A strong work ethic, excellent communication, and computer skills are needed as well as a minimum of three years in the green industry (Plant Purchasing preferred) and proof of network and portfolio.

The following job skills and abilities are required for the successful fulfillment of this very essential position and to meet the company's expectations:

- Identify best suppliers to attain materials for jobs.
- Ability to determine quality of product and procure those quality materials at the best possible prices and terms and within budget.
- Control and eliminate wasteful spending and excess buying of materials.
- With confidence, negotiate best quality and prices always looking out for the best interests of the company and to save money where applicable.
- Manage and maintain quality inventories
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- Work with division managers to carry out company project goals and production schedules.
- Travel as needed to find, tag and secure appropriate number of plants for upcoming projects.
- Evaluate and select plants that meet the company quality standards. Keep budget in mind and protect company resources by making educated decisions.
- Enhance and build organization's reputation by representing and conducting business in a professional manner at all times.

Skills preferred: In-depth Plant Knowledge, Quality Management, Ability to Manage Team Members, Delegation, Supply Management, Estimating, Inventory control and Maintenance, Budgeting Expertise and Attention to Detail.

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EMPLOYMENT

JOURNEYMAN MECHANIC – BORING, OR

Large wholesale nursery is seeking a skilled and self-motivated Journeyman Mechanic to join our team in our repair shop located in Boring, OR.

Applicant must have a valid driver's license and insurable driving record. Candidate must have the ability to work independently and assist other mechanics in the repair and maintenance of vehicles, tractors, forklifts, farm equipment and implements for a large variety of repairs, diagnosis and general service and upkeep.

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General Service, Gasoline/Diesel/LPG Engine Repair and Diag., Clutch/Transmission and associated component replacement (Tractor and Vehicles), Brake systems (Hydraulic and Air), Heavy Equipment Repair and Service including drive systems, Electrical Systems and wiring, Hydraulic systems and cylinders, some level of experience with farm equipment.

Any additional experience in welding and/or fabrication is a plus as well as familiarity with diverse farm/nursery implements or tire repair and replacement on vehicles/tractors. Candidate will have good communication and organizational skills, be highly motivated and goal oriented as well as being aware of and practicing safety in the workplace. Candidate must also possess knowledge of electronic diagnostic equipment and be open to further training and use of electronic data and labor management software platforms. The ability to maintain accurate records by recording service and repairs completed with parts and product usage is vital to the position. Must be able to handle and carry objects up to 80 lbs.

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EMPLOYMENT

NURSERY PRODUCTION COORDINATOR

Rio Verde, located in Cornelius, Oregon, occupies 300 acres containing 160 field and 140 container acres. We specialize in evergreen shrubs, trees, and specialty crops. We are part of a family of vertically integrated companies in the agricultural production and landscape distribution industries.

We are looking for a bilingual English and Spanish speaker that enjoys working at a fast pace with lots of variety and is highly organized with a strong attention to details, even the small ones. If you are a problem solver who makes decisions based on past events and prefers task completion over projects, then this may be a great fit for you!

This position will have a lot of day-to-day interaction and require coordination with our production team. Having strong technology skills is important as this position will be responsible for data entry and having a key role in the documentation of the production processes.

Key Responsibilities:

1. Production – Coordinate all production schedules, activities, and training with the Production Manager and Production Supervisors. Prepare and submit a variety of weekly reports to support managers in carrying out the production plan. Build and monitor a quality inspection process.
2. Materials & Supply Management – Maintain materials, supplies and small tool inventories including a check-out/check-in system, all production reporting related to the production plan, purchase orders and management direction.
3. Manage Workflow – Coordinate workflow and track productivity with metrics set by the company. Monitor attendance and headcount against budget. Assist with determining labor needs, allocation and deployment.

Required Education and Experience:

- High school diploma or equivalent
- 1-3 years in a nursery facility or related field.

Application Requirements:

- To submit your application for this position, please visit www.dcaoutdoor.com/careers
- Completion of Culture Index Survey. Without survey completion, your application is considered incomplete and will not be considered. The survey can be found at: www.cindexinc.com/c/A550CC



EMPLOYMENT

SALES REPRESENTATIVE – NEW JERSEY & NEW YORK

Iseli Nursery in Boring, Oregon, a producer of container and field-grown Conifers and Japanese Maples, is accepting applications for a Sales Representative to service New Jersey and Long Island, NY.

Qualified applicants will maintain the existing customer base, as well as develop new accounts, while residing in the territory. Applicants must be self-motivated, attentive to details, & possess honed communication skills. Experience selling nursery product in the territory preferred but not required.

In addition to commission-based compensation, this position provides a total rewards package that includes medical and a full suite of ancillary benefits, along with 401(k) with a matching employer contribution, as well as positive work environment.

Candidates can email a cover letter and resume to:

Alicia Fernandez – Human Resources
afernandez@iselinursery.com
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PRODUCTION MANAGER

A container nursery, located in the heart of the beautiful Willamette Valley in Oregon, is seeking a full-time experienced Production Manager to lead efforts in propagation, shrubs, grasses and perennials. Prefer candidates who speak English and Spanish and have proven leadership and management skills.

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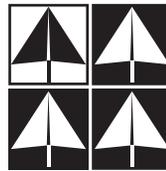
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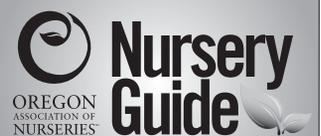
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GROWING KNOWLEDGE

Series content is coordinated by Dr. Jay Pscheidt, professor of botany and plant pathology at Oregon State University in Corvallis, Oregon.



An ongoing series provided by Oregon State University in collaboration with the United States Department of Agriculture and in partnership with the Oregon Association of Nurseries

The smart greenhouse

OSU researchers look to repurpose and adapt high-tech trackers and sensors for plant production

BY LLOYD NACKLEY, CHET UDELL AND ALAN DENNIS

GREENHOUSES ARE CRITICAL for nearly all nursery operations. They enable greater control over the growing environment for plants, providing numerous advantages in the face of unpredictable weather and increasing droughts.

That's why many growers use them to produce high turn floriculture, seasonally protect less-hardy perennials, and propagate plant material.

Unfortunately, today's aging greenhouses often fail to take advantage of new sensing, tracking and data technologies. Such technologies could make greenhouse management more automated and efficient.

Many of us are familiar with the Internet of Things (IoT), which is the extension of the Internet beyond just computers, smart phones and TV sets. Everyday objects such as refrigerators, coffee makers, cars, and traffic lights can now collect data and not only communicate over the internet, but autonomously collaborate to optimize our daily lives.

Cisco Systems estimates that more than 250 "things" connect to the Internet each second, with 50 billion total devices communicating online.

In a world where shoes can keep track of how fast and far we run, Internet-enabled distributed sensors that can automate and optimize greenhouse infrastructure offer exciting potential. With this technology, temperature, relative humidity, lighting levels, CO₂ levels, air quality and more could be managed and controlled as efficiently as the smart thermostat in your home.

Overcoming the cost hurdle

Precision agriculture — the use of information technology to support farming — is a growing field. There are at least three major roadblocks standing in the way of this technology being adopted — lack of time, lack of capital, and lack of confidence.

The nursery business is a busy one. Between growing plants, filling orders, shipping trucks and getting ready for the next season, there's hardly enough time to rest, let alone keep up to date on the newest technological advancements.

Where some growers have the luxury and capital to renovate or construct new infrastructure with the latest technologies built in, most of Oregon's farms are sole proprietorships managed by



Lopez and Larson programming the first generation sensor package at NWREC. PHOTO BY LLOYD NACKLEY

operators age 55 and older. Building new, state-of-the-art facilities is neither an option nor a priority for many of these small-to-midscale family businesses.

Commercial sensors can cost more than \$200 per sensor, with additional costs for data-logging and wireless connectivity running more than \$1,000 per location. Wireless sensor networks can easily cost more than \$10,000 per greenhouse, which really adds up when extended over many acres and many greenhouses.

One alternative solution is to try an off-the-shelf IoT kit such as the popular Arduino, an open-source hardware and software company and user community. Unfortunately the learning curve can be fairly steep for these do-it-yourself (DIY) technologies. To use them effectively requires knowledge in programming and electronics, making them inaccessible for the average grower.

To address these roadblocks, the Nursery Production Lab (@NackleyLab on Twitter) has partnered with the Openly Published Environmental Sensing (OPENs) Lab to develop an open-source, environmental sensing system that can be retrofitted into aging greenhouse infrastructures. This research is supported by a grant from the Oregon Department of Agriculture from state nursery license fees, as recommended by the Oregon Association of Nurseries Research Subcommittee.

By borrowing technologies from other electronic commu- ➤

The smart greenhouse

Manuel Lopez and Lars Larson programming the first generation sensor package at NWREC.

PHOTO BY LLOYD NACKLEY



nities, the Oregon State University team is seeking to create low-cost sensors to enable growers to take advantage of powerful IoT sensing and automation technologies without the need to rebuild new structures from the ground up.

Sensors that travel

In 2018, the Nackley Lab kickstarted a project with two OPEnS lab students, Lars Larson and Manuel Lopez, to prototype, install, test, and validate a sensor package at OSU's North Willamette Research and Extension Center (NWREC). Larson and Lopez had been working on a sensing system called the HyperRail that was originally developed to analyze a forestry crop using hyperspectral imaging.

Nackley and the OPEnS Lab director, Professor Chet Udell, wanted to see if the rail system could be modified for use in a greenhouse. The project was called a HyperRail because it is a track that allows a sensor package to travel, as an automated train, above a crop in a linear pathway.

The HyperRail was designed to be a modular system in many aspects. The first is length; this system can be adjusted to any greenhouse length.

The next modular element is the carriage system. This system is built onto a piece of polycarbonate that is cut to size, with holes drilled to specific requirements for the motor. It can be a stand-alone frame or can be mounted to either tripods or a structure.

These students are emblematic of a growing community of open source inventors at OSU who are part of an emerging "maker movement." There are deep ties between the maker movement and open source technology often attributed to software development. Both are rooted in a sharing culture, with the belief that open collaboration creates greater insights and opportunities for all.

According to the National Academy of Engineering, "free and open-source hardware is changing the face of science, engineering, business, and law." The maker movement is an extension of the DIY culture where science, art, and the curiosity inherent in tinkering collide. This movement also aligns nicely with the land grant mission of OSU as a leading public research university.

Larson and Lopez gathered data from the HyperRail prototype at NWREC, and with their advisors, Nackley and Udell and with funding support from the OAN-ODA Nursery Research Program they developed a plan to expand the product into a system they call HyperSense. The greatest difference between the HyperSense system and the original HyperRail prototype is the HyperSense package will be deployed in a 3D track system to create a system that can be configured for a wide variety of sensing purposes.

The HyperSense moves in three directions over a 25-meter rail on the x-axis continuously, two-meter on the y-axis, and



OSU undergrads assembling the pieces on the 3D gantry system for the HyperSense. PHOTO BY ARIEL STROH

one-meter on the z-axis, with the sensor package attached on the z-axis in a 3D-printed container. Nema 23 motors drive the sensor package along the rail with the use of a single belt system. The carriage can be programmed to visit a suite of locations to gather information from the on-board sensor package.

While the sensor package is in motion, it saves the data onto a web document called Spool. The OSU student team is also creating a website that will help make the data user-friendly and visualize the data into graphs and charts. Sensors implemented include CO₂ (K30 10,000ppm), temperature (Adafruit SHT31), relative humidity (Adafruit SHT31), luminosity (Adafruit TSL2591), and air quality (Nova SD011). There are plans to integrate multi and hyperspectral sensors, 3D imaging, RFID, and other technologies in the future.

Further testing

The HyperSense 1.0 will be tested and modified throughout the 2020 growing season at NWREC. When the team is satisfied that the package is robust for greenhouse conditions the plans will be freely shared on the OPEnS Lab website.

In addition to developing low-cost open-source technology solutions, this research collaboration is helping develop the pool of skilled laborers in Oregon, by provid-

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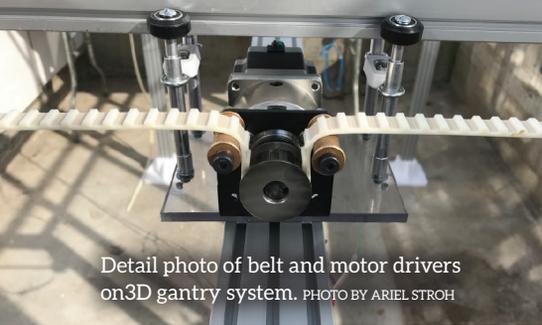
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Detail photo of belt and motor drivers on 3D gantry system. PHOTO BY ARIEL STROH



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ing research opportunities for horticulture students, as well as bringing-in computer science and engineering students who otherwise may not engage with Oregon greenhouse and nursery production systems.

Oregonians like Lopez became interested in creating electronic devices during robotics competitions through the MESA program (Mathematics, Engineering and Science Achievement) at Liberty High School in Hillsboro, never expected to be installing sensors in a greenhouse. None of the engineers on the OPEnS Lab team had any greenhouse experience for that matter. But that's one aspect the students like about working on these projects.

According to Lopez, "The open-source part of this connects everything. Each project that the OPEnS Lab collaborates on, including the HyperRail, is released under an open-source license." This means that all of the design files, computer code, bills of materials and instructions are freely accessible to anyone who wants to download them from their website at www.open-sensing.org.

Some community members who download and use OPEnS projects modify the designs or code and even send their improvements back to the lab so that others can benefit from them. It's a collaborative, iterative process.

"Many people tap into our projects at really high rates," Lopez says. "They work on it from there, and we work on our stuff from here."

Check in with the nursery team at NWREC this summer to see how the HyperSense team is growing together to provide science and engineering solutions that help sustain nursery production systems in Oregon. ☺

Lloyd Nackley is an assistant professor of nursery and greenhouse production systems at Oregon State University (OSU). He can be reached at lloyd.nackley@oregonstate.edu. Chet Udell is an assistant professor in the biological and ecological engineering department at OSU whose research focuss on wireless sensor technology and data protocols. Alan Dennis is a multimedia tech designer for the OSU Extension Service.

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MARKETPLACE

Becoming a Zoom Jedi master

The COVID-19 pandemic has forced me to work at home, isolated in what I have started calling “the 64th Avenue Bunker.”

As a result, my family has gained a deeper understanding of my severe technological deficits. They commonly hear me uttering phrases like, “I just want it to work!”

I am not quite to the level of talking to my mouse pad, but I’m not too far away from it, either. Once, when I left my laptop at the airport security checkpoint, I called my wife and asked her to go collect it. “What kind is it?” she asked.

My answer, after a long pause: “It is black.” I would compare my technological journey to the Star Wars saga. To overcome obstacles and fulfill our destiny, we must adapt to circumstances and surroundings.

My home was like being stuck on the planet Dagobah, where Yoda trains Luke — a murky quagmire with bog-like conditions, fetid wetlands and no signs of technology.

Red Leader 5 of meetings

Zoom is one of the dozens of video conferencing services available to the public. By most accounts, it has risen to the top of the heap. It is simple, it is intuitive and most of all — it is free.

The new world made by COVID-19 forced me to learn Zoom — fast.

I went from palm-sweating initial meetings where I was truly lost, to leading 5–10 meetings a day on the business side. Zoom also gave me a new way to stay connected to family and friends, and conduct regular neighborhood happy hours. See Threepio? Meet Six-Pack-to-Go.

So secure am I now in my Zoom abilities that I openly deride colleagues who leave their video off or audio muted, and cannot understand why nobody listens to them.

I have placed my droid in back, got in my X-wing Starfighter, and led the attack on political Death Stars all over the state and nation.

Through this video portal, OAN successfully spearheaded the market map for the Nursery and Landscape Association Executives of North America (NLAE),

worked with coalitions made up of people from every part of the political spectrum, and co-convended a weekly nursery industry triage group with states and provinces.

A nation in isolation (planet Hoth-style) goes to the internet

It seems like a decade ago when the OAN Board last met in person on March 10. Seattle, Washington was in the news due to its developing cluster of COVID cases. By that Friday, March 13, most of the nation was closed. Social distancing became an historical marker for numerous generations.

We are a social society. On one hand, technology is destroying human interaction through cell phone text exchanges. On the other hand, it provides much-needed nourishment to a nation in isolation, thanks to video conferencing. If social distancing is the ice planet Hoth, where the rebels hid out in *The Empire Strikes Back*, then Zoom is the lightsaber that broke us free from the cave — or the tauntaun’s belly that warmed us.

It was astounding that online video conferencing became super accessible to all generations, and was even adopted by them — even myself and my luddite Obi Wan Kenobi (aka, my father). But even more amazingly, the internet providers adopted a wartime footing and were able to maintain service during the most severe strain for access in memory.

This issue is all the more reason to make robust investments in rural broadband and clear away Federal Communication Commission barriers to all communities.

It is not a trap, Admiral Ackbar

“It’s a trap!”

Admiral Ackbar had one of the most famous and quoted lines in *Return of the Jedi* when he realized the Empire was fully ready for the Rebels’ supposed sneak attack on the second Death Star.

Many recovering technophobes have the same feeling about video conferencing. They’re skeptical that it can be a long-term way to keep personal connections.

Friends, it is now a part of everyday life. COVID-19 is not going to be over by summer. Our industry and personal networks have adapted. However, if you are a nascent “Zoomer,” here are some rules of thumb.



Jeff Stone
OAN EXECUTIVE DIRECTOR

1) Do not underestimate the value of seeing people — even remotely. The connection between us is real, so embrace it.

2) Make lemonade out of lemons. The annual OAN lobbying trip to Washington, D.C. was canceled, so leaders got on Zoom with five of the seven members of the Oregon delegation and the rest are being scheduled.

3) Zoom is an efficient way to disseminate real-time information. We had leaders from the bankers and credit union associations provide a tutorial on federal aid packages. Meetings that normally would take weeks to schedule now take days.

4) Everyone is using this platform, so be aware. Zoom accounts are easy to set up and recently have wisely added a password for those you invite to enter. This is a good practice, because an open Zoom call can result in uninvited participants and content.

Return of the trade show

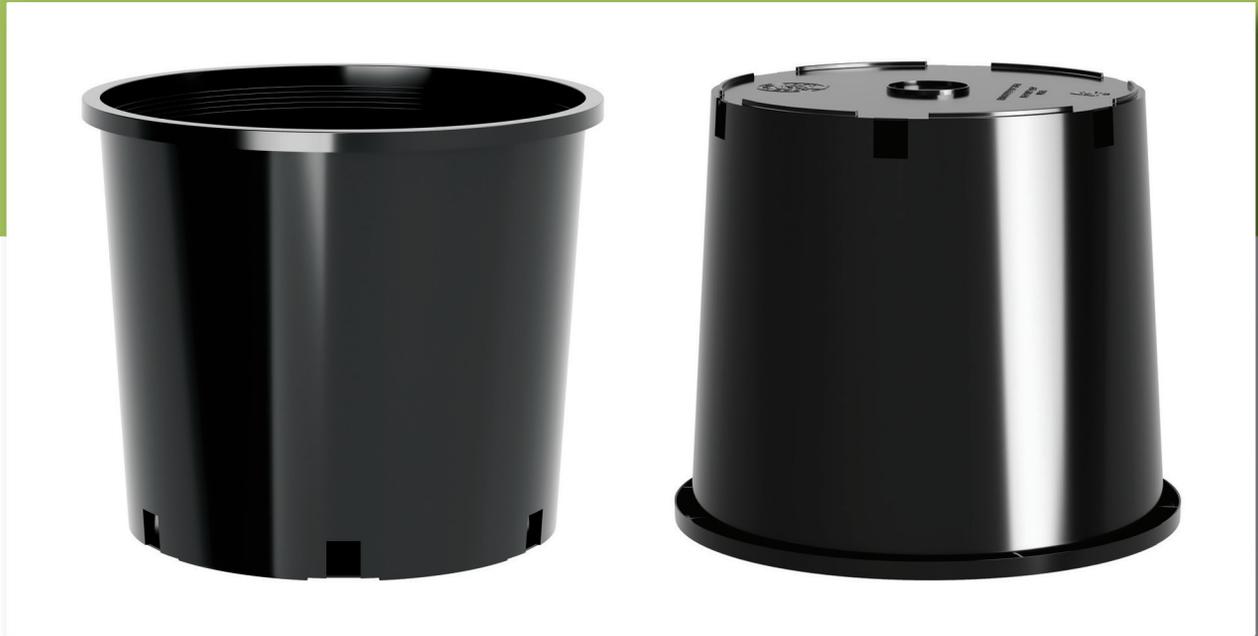
COVID-19 has turned the trade show circuit on its head. Mass gatherings of people are unlikely to be allowed anytime soon.

However, there are good reasons trade shows have been part of our industry ecosystem. No video feed can do an in-person nursery visit justice, duplicate the plant-buying experience at your local garden center, or deliver supplies to the industry or the public.

It is very possible that Trade Shows 2.0 may include a virtual component in addition to the traditional experience we all know. We shall see. I don’t think trade shows have gone into the afterlife. They are not the force ghosts at the end of the *Return of the Jedi*. Rather, this is the dawn of a new normal. ☺

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