

Digger

MAY 2020

Coping with COVID-19

Green industry
businesses react
and respond to
a dangerous
pandemic

FULL COVERAGE
INSIDE



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Printed in Oregon on domestic recycled paper when available.

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On this page: Left: A side-by-side comparison of products treated with mycorrhizae (left) and those without (right). PHOTO COURTESY OF MYCORRHIZAL

APPLICATIONS Right: *Acer japonicum* 'Aconitifolium' is recommended by Great Plant Picks for landscapes. PHOTO COURTESY OF GREAT PLANT PICKS



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Jim Simnitt
OAN PRESIDENT

Into the unknown

Spring is a hectic time.

Add in a worldwide pandemic with economic uncertainties, and it can be a recipe for disaster.

The most unnerving aspect is the unknown. As an industry, we are accustomed to unpredictable weather. We see damaging frosts, rainy weekends, and hot, dry summers stressing the growing season.

These are all hiccups we've been through before and can manage. What has changed rapidly in this pandemic is the way we conduct business and the way we grow our plants.

I have been impressed with how quickly our members have pivoted to navigate these uncharted waters. Retailers are offering curbside pickup, online ordering and home delivery. Growers and wholesalers have changed their order pulling, loading of trucks, and day-to-day interactions. Suppliers have made delivery of product and pickup more streamlined with less person-to-person interactions. All of these changes have happened in short order during the most stressful and frantic time of year.

As our executive director, Jeff Stone, likes to say: "The association is a mirror of the industry." When the industry does well, the association does well. When we come under stress, the association comes under stress.

Impressively, the OAN also pivots like our members do. Immediately as the COVID-19 crisis became apparent, the OAN office staff started working remotely. They started on the OAN website and built the coronavirus page that is updated daily at oan.org/coronavirus.

Jeff immediately reached out to other state nursery associations execs to build a coalition that could share ideas and solutions. He and Minnesota's executive director, Cassie Larson, spearheaded a webinar meeting to bring together a dozen state associations, five national associations, and economic experts to get real-time information out to our members.

When other state governors started issuing stay-home orders and ordered nurseries in other states forced to close, we went into action to ensure that would not happen in Oregon. Spring is when literally everything has to happen — shipping, potting, fertilizing, spraying, trimming and more. We cannot be shut down and left to rot on the vine. OAN members, Jeff and I all contacted the governor's office and explained what a shutdown would mean to the largest agriculture sector in Oregon.

We were in real jeopardy of having our doors closed during some of the biggest revenue-generating weeks in the industry. Hearing the governor's office respond to say "we hear you" was a huge win. Gov. Brown threaded that needle perfectly, in my opinion, by allowing nurseries to decide whether to shut, modify, or amend work protocols to meet new guidelines. We should make the decisions for our families and employees, not the government.

Nurseries reached out to customers across the country to see if markets were open, but there was a lot of confusion about each state's orders.

The OAN worked with the Arizona Nursery Association Executive Director Cheryl Goar Koury to repurpose code from the Plant Something state map into a COVID19 resource map. They made a simple online tool to find out which segments are open, restricted or closed in each state. You can find it at www.nlae.org/covid-19/

As we are told by the healthcare professionals, the best thing we can do is flatten the curve. But our time spent mitigating danger has covered up many of the spring days we enjoy.

We, as an industry, need to extend the spring season. We need to have plants ready for when the public get outside. One of the best things for a person's mental health is to beautify their yards by planting some plants. We want to be there for them.

We are in this together — and together, we can continue to grow. ☺



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**We have your back
Gardening is not canceled.**

Oregon's nursery, greenhouse, retail and supply chains are open for business.

Our state and governor could have mandated full closures and declared our businesses non-essential. The fact they didn't do this is a credit to the OAN's leadership and its advocacy team. They were the perfect picture of vision, pure effort and high commitment. They knew that failure was not an option, and they delivered.

Our members see and appreciate this outcome, but they did not observe how it came together behind the scenes. We kept pressing, lobbying and informing for several critical, pressure-filled days.

I love March Madness, but not like this. Here's a look inside 72 pivotal hours where we fought to keep our industry running.

In mid-March, as states began implementing stay-in-place orders and the nation was in full flux, the OAN transformed to "COVID mode" and started redirecting our resources. We had to keep employees safe, while helping businesses survive. I knew that to deliver positive outcomes for the industry, I might need to cash in every political chit accumulated during my 15-year tenure at OAN.

Our first task was to address the Oregon Legislature's Joint Committee on Coronavirus Response, which first convened on Wednesday, March 18. At the same time, we knew Gov. Kate Brown was developing a list of businesses to be deemed essential.

We made a strong case that our agricultural sector is critical and must remain open. Oregonians need to work, and gardening is a safe and healthy outlet. We also knew any wave of closures would create an economic crisis to match. We suggested ways the state could mitigate impacts on employers and employees.

Ambiguity can feed an uncontrolled rumor mill, creating its own market destabilization. We urged the state to clear things up, so everyone could stand on solid ground.

Meanwhile, our leadership and communication team created a Coronavirus resource page for the industry to access, which you can find at www.oan.org/coronavirus. We made it public — no member login required. It was no time to hoard information.

At the same time, we saw that decisions were going to be made at the state level. Various green industry associations were providing information about state openings and closures, but there was no one-stop resource pulling it all together.

Cassie Larson, executive director of the Minnesota Nursery and Landscape Association (MNLA) and I convened a triage group of industry leaders. Out of this was born a guide to the status of every state and province, which you can find at www.nlae.org/covid-19.

As Wednesday turned to Thursday, and we kept frantically providing input to the legislature and governor, we became aware that 22 mayors in the Portland area were looking at imposing their own set of local orders. Since our nursery industry is largely based around Portland and Salem, this was concerning.

I conferred with Dave Dillon at the Oregon Farm Bureau to target these mayors with a message showing that all of agriculture is essential — nurseries included. We explained our members' ability to social distance and stay operational.

As Thursday turned to Friday, our contract lobbyist told us an announcement from the governor was coming as early as the weekend. We were hopeful, but uncertain that our members would still be in business Monday morning.

Late in the evening, Alexis Taylor, director of the Oregon Department of Agriculture, sent a note saying that the governor would be closing many kinds of businesses — but agriculture was not on that list.

Our president, Jim Simnitt, contacted the governor's chief of staff for confirmation. At 1:30 a.m., I got a text from the chief of staff

(Continued on page 14)



**Jeff Stone
OAN EXECUTIVE DIRECTOR**



Calendar

Get the word out about your event! Email details to calendar@oan.org by the 10th day of the month to be included in the next issue of *Digger*.



Editor's note: At press time, due to the public health threat of the COVID-19 virus, the majority of gatherings in Oregon have been canceled or postponed. Therefore, please be advised that some of the events listed below may or may not proceed as planned. People attending events or meeting in person are urged to practice social distancing in order to reduce opportunities for transmission and spread of the COVID-19 virus. We are including the most current information below as of press time, but please check with organizers for the latest information before making plans to attend any event or gathering.



MAY 30-31

SPRING GARDEN FAIR - **CANCELED**

The Clackamas County Master Gardeners will present their 36th annual fair at the Clackamas County Event Center (694 N.E. Fourth Ave., Canby). The event will feature more than 140 vendors, 10-Minute University™ Classes, free pH soil testing and an “ask an OSU Master Gardener” feature. Admission is \$5; kids under 16 are free. Go to www.springgardenfair.org for more details.

JUNE 11

DUFFERS CLASSIC - **POSTPONED**

The 31st annual golf tourney, which had been scheduled the Stone Creek Golf Club in Oregon City, Oregon, won't happen June 11. It may be rescheduled for a later date or replaced with a virtual fundraiser. This annual benefit for the Oregon Nurseries' Political Action Committee (ONPAC) is always a great way to reconnect with friends while supporting a strong nursery industry voice in Salem and Washington D.C. Check the OAN website, www.oan.org/duffers for updates.

JUNE 25 - **TENTATIVE**

MT. HOOD CHAPTER PIONEER DINNER

Join the Mt. Hood Chapter in honoring our OAN Pioneers – those over the age of 60 with more than 20 years in the industry – at the annual Pioneer Dinner! The dinner and social is set to take place at the Riverview Restaurant, 29311 S.E. Stark Street, Troutdale, Oregon. Social hour will begin at 6 p.m., followed by a meal at 7 p.m. Finish up the evening with a build-your-own ice cream dessert. Honored Pioneers and their spouses will enjoy a complimentary dinner courtesy of the Mt. Hood Chapter. Cost for all other adults is \$25; free for kids under 18. Please RSVP online at www.oan.org/events.

JUNE 17

OAN OPEN HOUSE - **CANCELED**

OAN members and their guests are invited to the OAN Open House. Learn more about terrific member benefits and programs, including Legal Access, health coverage, Trucks to Trade Shows, fuel discounts, credit card processing, discounted Farwest Show booths, OAN advertising, and much more! Beverages and light bites will be served. Please drop in between 3-5 p.m. Wednesday, June 17 at the Little Prince of Oregon, 15868 N.E. Eilers Road, Aurora, Oregon. For more information or to RSVP, contact Kelsey Hood at 503-582-2010 or khood@oan.org.

JUNE 25

DIGGER: FARWEST EDITION

Display ad reservations for the 2020 Farwest Edition of *Digger* magazine are due June 25. More than 11,500 copies of this extra-large edition will be distributed to *Digger* subscribers, as well as exhibitors and attendees of the Farwest Show in August. To reserve your space, contact Blair Thompson, OAN advertising manager, at 503-682-5089 or email ads@oan.org.

JULY 8 - **TENTATIVE**

MT. HOOD CHAPTER PITCH AND PUTT

Inspired by the movie *Tin Cup*, the OAN Mt. Hood Chapter is hosting a golf event for growers at McMenamins' Edgefield Golf Course (2126 S.W. Halsey St., Troutdale, Oregon). Player packages include a sponsor bag, a rental putter and pitching wedge (or you can bring your own equipment), one ball and one beer. Each guest will take a shot at the mandatory closest-to-the-pin competition. A 50/50 raffle to benefit the chapter is also planned. For more information, contact Scott Ekstrom at scott_ekstrom@yahoo.com.

JULY 11-14 - **TENTATIVE**

CULTIVATE'20

Presented by AmericanHort, Cultivate offers educational and networking opportunities and exhibits featuring technology, new products, services and plant varieties. Cultivate'19 is set to take place at the Greater Columbus Convention Center in Columbus, Ohio. A final decision on this year's event is set to be announced on May 15. For information, visit www.cultivate20.org.

AUGUST 26-28

FARWEST SHOW

The biggest green industry trade show in the West is set to take place at the Oregon Convention Center, 777 N.E. Martin Luther King Jr. Blvd. in Portland, Oregon. The show, produced by the OAN, attracts exhibitors and attendees from across the country and the world. We are planning for the show to take place as scheduled, and hopeful the threat will have subsided by then. However, we will continue to monitor the situation and take all prudent precautions to ensure a safe and successful show for all. Log on to www.farwestshow for more information.



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.



OBC Northwest appoints new VP of sales and marketing

Melanie Miller-Gonzalez has been promoted to the position of vice president, sales and marketing at OBC Northwest Inc., according to a release by the company. She has been with the company since 2009 and will supervise the sales and marketing division of the nursery and greenhouse equipment supplier, which is based in Canby.

Raymond Scesa has retired from OBC Northwest. He first joined the company in 1989 and worked to significantly expand the company's sales capabilities as the nursery trade grew over time. He previously worked for Darigold's grain division.

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.



Workers moving plants at Kraemer's Nursery in Mt. Angel, Oregon practice social distancing by observing a limit of one person per utility vehicle, with one additional person allowed on the trailer. PHOTO COURTESY OF KRAEMER'S NURSERY

Nurseries problem solve a pandemic

BEN ROUGH (PRONOUNCED “row,” rhymes with “now”) will never forget his first day of work at **J. Frank Schmidt & Son Co.** nursery in Boring, Oregon.

The newly hired CEO of the company started on March 23 — the same day that Oregon Gov. Kate Brown issued a mandatory stay-in-place order for Oregonians in response to the COVID-19 pandemic.

“We hit the ground running,” Rough said. “There’s nothing that builds trust and a real good working environment than if you come in and deal with a difficult issue.”

While the order allowed nurseries to continue to operate, among many other types of businesses, it required them to implement social distancing measures to protect employees, customers and their families. Nurseries adjusted procedures and rearranged workspaces to keep employees at least

six feet apart, outfitted them with personal protective equipment, put up physical barriers, and reduced contact between employees.

All of this had to be invented in response to an unprecedented pandemic.

“We came together as a team to implement (new) procedures as quickly as possible,” Rough said. “The first three days, it was probably nonstop as to how we can deal with things in a different way and provide the safest environment possible for our employees.”

Shane Brockshus, West Coast manager for Minnesota-based **Bailey**, likewise made communication a priority at the grower’s four West Coast farms (three in Oregon, one in Washington). “We’re communicating more, definitely, and trying to do as a good job as we can with that, at all levels,” he said. “We’re trying to keep transparency with our staff, providing education, resources >>

Northwest News

(Top) As one adjustment to the COVID-19 pandemic, J. Frank Schmidt & Son Co. posted a sign asking truckers to stay in their vehicles and call in upon arrival, rather than checking in in person upon arrival to the nursery. Pictured is Ben Rough, CEO. PHOTO COURTESY OF J. FRANK SCHMIDT & SON CO.

(Bottom) Workers at Kraemer's Nursery interact to get the job done while still socially distancing. PHOTO COURTESY OF KRAEMER'S NURSERY

and reminders of protocols.”

An entire shipping process the company had overhauled to make it more lean was walked back to keep employees working farther apart, thus trading efficiency for added safety.

“If we can keep people healthy and they know we’re making that effort, and we can keep product moving, then it’s all worth the effort,” Brockshus said.

Chris Ames, director of operations at wholesaler **Kraemer's Nursery** in Mt. Angel, Oregon, said the nursery cut back on contract workers but has been able to keep all regular employees on board. “We’ve been trying to do the critical work and pulling orders,” she said.

Management and employees at Kraemer's worked as a team to adjust operations, comply with the social distancing order, and protect employees.

The nursery changed how it transports plants and people around the nursery, imposing a limit of one person per Kubota utility vehicle, with one additional worker allowed to ride a trailer pulled behind. “If we have to make an extra trip, that’s what we do,” Ames said.

According to Rough, Schmidt has kept employees working in smaller groups that are consistent — no one switches to a different farm or location.

Several nurseries reported they are involving employees in problem solving.

“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,” Rough said. “We encourage people to come up with ideas and we can implement those safe practices.”

Likewise at Bailey.

“You see the people innovate,” Brockshus said. “It’s what you do, and what you have to do, in this industry.”

The pandemic put growers in the position of managing their operations more carefully than ever before, while at the same time dealing with the prospect of a decline in sales.

The Oregon Association of Nurseries surveyed members informally, finding that nearly 98% of member companies that



responded stayed open after the stay-in-place order came down. However, nearly 46 percent of the members indicated they were using modified procedures such as remote work, limited staff or limited hours.

Three members said they closed their businesses either due to worker illness or a management decision not to expose workers to potential risk. One business (not a grower) was covered by the state’s order for certain businesses to close.

By and large, members reported they were having a strong season until mid-March, when cases of the COVID-19 illness began to be more widely reported, and governors began imposing social distancing measures and shutdowns. From that point, OAN members responding to the survey indicated a negative effect on business from the pandemic, and sources interviewed by *Digger* agreed.

“We had a pretty decent March, but then April, it’s just not there,” said Vinny Grasso, sales manager at A&R Spada Farms, a large wholesale grower based in St. Paul, Oregon.

Still, Grasso did see some new orders from garden centers doing their best to stay open and serve customers. “Our customer base is persevering,” he said. “They really want the business and they’re going to figure it out.”

Brockshus, at

OAN offers coronavirus guidance for businesses

The OAN has created a COVID-19 resource page and will keep it updated with relevant information for nurseries, greenhouse operators and other green industry professionals.

The page contains links to the coronavirus guidance offered by global, federal and state agencies, as well as information from nursery industry groups and business groups. Recently, we added links to the coronavirus resource pages for the various state green industry associations that have them, so that business owners have quick access to what’s going on in other states where their customers, vendors and other partners may be.

Items are flagged as they are added to see what’s new at a glance.

www.oan.org/coronavirus



Bailey, said it was too early in mid-April to know the full effect on sales. “We know it’s going to affect us,” he said. “The unknown is how deeply. It’s so fragmented, where it’s state by state, sometimes at the county or city level, what our industry is allowed to do, and that keeps changing.”

ONE-STOP NATIONAL NURSERY INDUSTRY RESOURCE FOR COVID-19 LAUNCHES

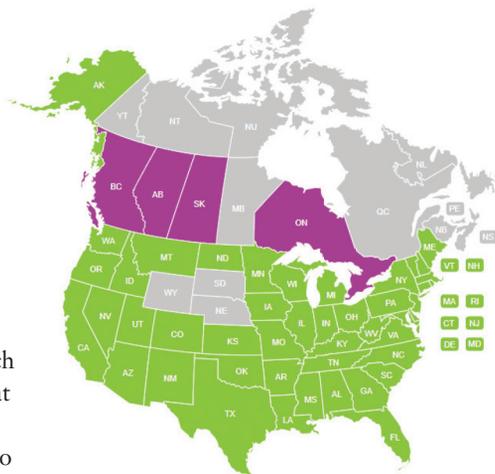
The Nursery & Landscape Association Executives of North America (NLAE) group has launched a one-stop tool for green industry businesses to see how operations and shipments to and within various North American states and territories are affected by the COVID-19 pandemic.

“Agriculture is essential, and nurseries are a part of agriculture,” Margaret

McGuire-Schoeff, executive director of NLAE, said. “However, each state and each territory can have its own rules about what is deemed essential and what is permitted to operate. We felt a centralized resource to track it all was absolutely needed.”

To use the NLAE COVID-19 map, simply log on to www.nlae.org/covid-19. The map is hosted by NLAE and was developed by a partnership comprised of the Oregon Association of Nurseries, the Arizona Nursery Association and NLAE, with contributions from various other state trade associations.

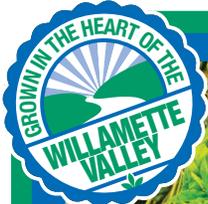
The interface is simple: if the user wants information about a particular state or Canadian territory, they just click it. When they do, a box shows the current open/closed/restricted status of growers, greenhouse operations, retailers and landscaping/supply chain businesses in that



state or territory. It also provides additional green industry resources related to COVID-19 from each participating association, as well as the relevant orders from each state or territory, if available.

The idea came from Jeff Stone, executive director of the OAN

“We felt a strong need for something like this in Oregon,” Stone said. “Our state ships 80 percent of the nursery stock it produces to other states, and more than half of the material goes east of the Mississippi River. That’s a long ways to send a truck. Growers need to know what’s going on >>




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Marr Bros. Bark

Northwest News

Dan Heims of Terra Nova Nurseries Inc. made an appearance on the *Martha Stewart Show* in 2011.

in the markets they serve, and we wanted to provide this resource for them.”

The NLAE COVID-19 map was inspired by a similar map, which was created by the Arizona Nursery Association and spearheaded by its executive director, Cheryl Goar Koury. It shows which states are participating in the Plant Something program, which is a consumer marketing initiative for the green industry. NLAE, ANA and OAN repurposed code from that map to create the NLAE COVID-19 map.

“We enlisted our developer once we identified this need,” Goar Koury said. “He was quick to respond, and I think we ended up with a powerful tool that will really benefit the industry.”

AMERICAN HORTICULTURAL SOCIETY HONORS DAN HEIMS

Dan Heims, co-founder and president of OAN member **Terra Nova Nurseries Inc.** in Canby, Oregon, was named the 2020 recipient of the Luther Burbank Award. The award is presented by the American Horticultural Society (AHS), in recognition of extraordinary achievement in the field of plant breeding.

Heims founded Terra Nova in 1992, and in the 28 years since, has led its breeding efforts which have resulted in the introduction of more than 1,000 plant selections, including groundbreaking new coral bells (*Heuchera* spp.), foamflowers (*Tarella* spp.), and coneflowers (*Echinacea* spp.).

Heims told *Digger* that he always considered Burbank an inspiration — “I have his picture on my desk” — and is honored to receive an award named for the famous botanist and horticulturist. Burbank lived from 1849–1926 and developed many fruits, flowers, grains, grasses and vegetables.

“My life goal, as you might have heard, was to exceed the 800 plants that he had introduced to horticulture,” Heims said. “I think we rounded 1,000 plants last year or the year before, so I can die now — I’ve done my life’s quest.”

Heims said he was first inspired to

pursue *Heuchera* breeding while visiting with Chet Tompkins at one of Burbank’s former breeding stations. “I was in his little back area next to the hedge and said, ‘Oh my God, what is that?’ He had a *Heuchera* that inspired me to continue further.”

The Luther Burbank Award is one of the Great American Gardeners Awards that AHS presents annually to individuals, organizations and businesses as a way to recognize their significant contributions to American gardening through scientific research, garden communication, landscape design, youth gardening and conservation.

All of this year’s award recipients are set to be recognized at the Great American Gardeners Awards Ceremony and Banquet, which is scheduled to be held Thursday, June 18 at the AHS River Farm headquarters in Alexandria, Virginia. AHS was founded in 1922 and is dedicated to modeling, teaching and advocating for earth-friendly, sustainable gardening practices.

Heims said he’s hopeful the banquet will come off as scheduled. “If it happens, it happens,” he said. “I’m hoping.”

Download a full list of recipients at tinyurl.com/vockfk4 (PDF)

24,000 REGISTER FOR OSU MASTER GARDENER COURSE

The chance to learn more about vegetable gardening has proved irresistible to people who are spending copious time at home due to the COVID-19 pandemic.

After the **Oregon State University** (OSU) Master Gardeners began offering their online vegetable gardening course for free, more than 17,600 people signed up as of April 1, an OSU Extension stated in a press release. By April 7, more than 24,000 people enrolled in the course. The number continues to grow by a thousand people each day.

Go to tinyurl.com/s2zmhzl for details.



Announcements:

LITTLE PRINCE OF OREGON CREATES REFERRAL PROGRAM

In response to the COVID-19 pandemic, OAN member **Little Prince of Oregon Nursery** (Aurora, Oregon) created an online affiliate marketing program called Garden Center 911. Under this program, retailers refer customers to the wholesale grower’s consumer website, www.littleprinceplants.com. Little Prince sells the plants and ships to the customer directly, and the retailer gets a 20% commission on each referred sale.

“One of our core beliefs at Little Prince is the best place to buy Little Prince plants is your local Garden Center. That’s the first message an online shopper sees when they enter our online store, and that will never change,” Little Prince Director of Business Development Mark Leichy said. “We know that many garden centers have closed temporarily due to COVID-19, and we want to help support those businesses that supported us for so many years.”

Those interested may contact Leichy at mark@littleprinceoforegon.com.

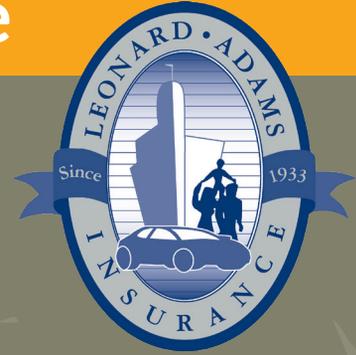
SBI SOFTWARE CREATES RETAIL PICKUP PROGRAM

SBI Software (Portland, Oregon) created a no-contact plant ordering portal in response to the COVID-19 pandemic. It allows retailers to upload inventories and pictures to a website, www.nocontactplantpickup.com, where customers can then order and pay for the plants online using their computer, phone or tablet.

After ordering, the customer is noti-

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fied when the order is ready to be picked up at the retailer. Upon arrival at the retailer, the customer simply shows the retail staff an order number, who then loads the car. The customer can then simply drive away without having ever left their car.

“We know it will protect consumers, plants and jobs,” said Aaron Allison, co-founder of SBI Software. “No-contact plant pickup is the future, and it will protect jobs in our industry.”

J. FRANK SCHMIDT & SON CO. APPOINTS BEN ROUGH AS CEO

J. Frank Schmidt & Son Co. nursery (Boring, Oregon) has appointed Ben Rough as its new chief executive officer (CEO), the company announced.



Rough brings more than 20 years of green industry experience to his new post, climbing up from an entry-level customer service position to several executive leadership appointments. He most recently served as director of sales and distribution for DCA West Nursery (Banks, Oregon). Prior to that, he served as vice president at Glenn Walters Nursery. Read more at tinyurl.com/rbbryop.

FALL CREEK FARM & NURSERY WELCOMES BOARD MEMBER

Blueberry plant breeder and grower **Fall Creek Farm & Nursery Inc.** (Lowell, Oregon) has added Kevin Murphy to its board of directors, the company announced.

Murphy became the company’s fifth board member outside of the founding Brazelton family. The company said it wants to incorporate diverse business perspectives as it explores growth opportunities and strategies.

Murphy is an experienced leader in the produce sector, and his knowledge of supply chain, process improvement, marketing and management is internationally recognized. Most recently, he was a chief executive officer of Driscoll’s for 13 years, but he also worked with Capurro Farms, Fresh Express Farms and TransFRESH Corporation.

Read more at tinyurl.com/r2qp743. >>

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In Memoriam DONNA KRIEG



The Oregon Association of Nurseries is saddened to share the news that Donna Krieg, founder of Nowlens Bridge Perennials in Molalla, Oregon, passed away Friday, February 28, 2020, due to complications from cancer. She was 72 years old.

Born in Whittier, California, Donna grew up in Sacramento. She moved to Oregon and met her future husband Jim while pursuing a degree in education from Oregon State University. At that time, Jim was drafted into the Army. While he was on leave in the fall of 1967, they got married, and Donna postponed her degree to live with him in Germany for 18 months. They both returned to Oregon to complete their educations once his tour

was over. Together they bought a farm in Marquam, Oregon, in 1972, where she quickly adopted the farm lifestyle and helped her husband raise turkeys.

Donna founded her plant nursery, Nowlens Bridge Perennials in 1998. Her business focused on hardy plant varieties for the Willamette Valley area and concentrated on teaching her customers proper care and maintenance. She as a member of the Cascade Nursery Trail and sold products at Hardy Plant Society and Master Gardeners sales.

Donna was also an active volunteer for the Oregon Turkey Improvement Association and volunteered to give presentations at the Oregon State Fair.

A celebration of life gathering is scheduled for 10 a.m.–2 p.m. Saturday, May 30 at Nowlens Bridge Perennials, 37377 S. Nowlens Bridge Road, Molalla, Oregon. ☺

We have your back (Continued from page 7)

confirming we would be OK.

We have your back

This is a mere fraction and quick peek at a turbulent 72 hours. Our security was far from secure. It was a dicey landing, yet we were resilient.

The OAN has your back — no matter where you reside in the nation or in a Canadian province. We are one. We will keep looking out for you so that you can make the right choices for your employees, your community and your company. ☺



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The first employee people see

IMAGINE YOU HIRED an employee who, when asked about your inventory, could only tell people what you *used* to sell. Or when asked where an item could be found, could only inexplicably point to empty space or not answer at all.

Simply put, a single interaction with this employee might lead your customers to assume that you had absolutely no idea how to run your business.

Sadly, there's a good chance you've already got an agent like this as the first point of contact for many of your customers.

Of course, I'm talking about your website. Fortunately, I've got a few suggestions that will help you get your site working *with* you, rather than against you — a short list of best practices you can adopt and some things you'll want to avoid:

Best practices

Your website should accurately reflect who you are. A first-time visitor should be able to tell immediately who you are and the type of business you run.

If you're a retailer, your customers should feel welcome and confident that you'll be able to help them.

If you're a wholesaler, users should be made aware that you do not handle individual plant sales and your availability list should be readily accessible.

Keep it clean and professional.

Today's audience can spot the difference between a professional website and an amateur one in an instant. Your site should be easy to navigate and search. Fonts should be consistent. Images should be optimized at the proper resolution and include alt-tags. When it comes to images of your merchandise and inventory, use a professional photographer or acquire high-quality images, which will have better longevity on the web and can be used for marketing pieces, as well.

Your website should be accessible from any device. No matter which platform, browser, or device your customer is using, they should have the same, easy-to-use

experience. If you're not using live text for every part of your written content, it will be nearly impossible to have responsive content that is legible on mobile devices. Today, if you can't easily read your website from a laptop, tablet, or mobile phone, you're losing business.

Access to contact information must be present on every page. Customers and clients should never have to wonder how to reach you. You need to make it as easy as possible to find contact information, including a phone number.

Things to avoid

Websites that are out of date. If your website is clearly outdated, customers won't trust the information they see. There are many signs that a website is out of date. It may be a design that looks like it was created in Microsoft FrontPage 97. It could be dated imagery, content, or stale merchandise. It may be a banner that announces, "New for 2016."

Too much copy. As a rule, customers are coming to your website for information, but they're *not* coming to read at length. Information should be concise and easy to digest. Generally, there should be nothing more than a short paragraph for each section on a page.



Shelly Weasel

Shelly Weasel is the web lead for Pivot Group, a Portland-based marketing and customer experience (CX) agency that helps clients engage their customers through research, marketing, and training.

Immature branding. Branding is a statement of who you are, and it's reflected in every choice you make on your website. It's the voice you speak with that lets customers feel they know you. Poorly written copy, taglines, and hand-drawn logos tell the customer you're not ready for the big time.

Random color palette. The color palette you use for your website is an important element of design and branding. It's not enough that you think it looks pretty — it must be consistent and relevant to the rest of the design of your website. Additionally, poor color choices can even affect the legibility of your site, making content nearly impossible to read.

Where the value is

In the long run, a well-designed, well-utilized website will be much less expensive than any traditional employee you can hire and will likely bring in more business. It's well worth the expense incurred to work closely with a professional developer to design the website that will work for you 24/7. Then plan on conducting thorough site maintenance at least once a year.

With just a little attention upfront, you'll have a reliable, hardworking employee that will be working for you for years. Where else can you find someone who will be out there year-round, 24 hours per day, digging up customers and keeping them informed, without overtime pay, sick days, or holiday pay? That's the kind of employee you really want to have! ☺



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Up and running – online

For retailers, an unfortunate pandemic accelerates the trend towards online ordering

BY JON BELL

IT'S MAY, THE MONTH of Mother's Day and, typically, the peak season for garden centers and nurseries in Oregon and around the Northwest. It's the month when Americans usually spend close to \$1.9 billion on flowers to honor their moms and when pastime gardeners usually pack garden centers to stock up on the plants that will enhance their landscapes at home.

But this May is not like the traditional May.

All throughout the spring, the COVID-19 pandemic has been wreaking havoc on the horticulture industry. Wholesale and retail nurseries in Oregon have been allowed to remain open so long as they abide by social distancing guidelines.

But the big in-person events and sales that usually pop up this time of year in the weekends leading up to and beyond Mother's Day? Those aren't happening.

"That surge of business is something that happens every year," said Sid Raisch, president of Horticultural Advantage, an Ohio-based garden and retail consultancy. "Most all garden centers and retail nurseries have full parking lots and are maxed out on Mother's Day weekend, to the point they couldn't do any more business without more parking. With those social distancing rules in

place during the peak of sales, it's going to be impossible to do that all day long."

The result will likely be a sizable ding to nurseries and garden centers who were counting on the traditional bump that comes with the spring season. But it might also do something that's been somewhat slow to come to the horticulture industry in recent years: push nurseries and garden centers to beef up their e-commerce offerings.

Even before COVID-19, those nurseries and garden centers who didn't offer much of an online presence, especially a shopping one, were leaving money on the table from customers who prefer to shop on the web. When the virus struck, all but eliminating in-store shopping for many in the horticulture industry, not having a remote and digital way for customers to buy plants only compounded the situation.

Now more than ever, retail and wholesale nurseries, as well as garden centers, are facing the reality that they've got to be online for their customers.

"This has definitely lit a fire under people and it's a mad scramble just to get a simple web store up," Raisch said. "That's not an undoable thing, but it's not everything." »»

A reluctant bunch

Just by their very nature, plants are one of the remaining holdouts in the shift to online retail shopping. People still seem to prefer to see a plant or a tree in person before they buy it. There are also storage and shipping logistics involved with plants that aren't at issue with other goods, such as books or technology devices.

And folks who work in the retail nursery and garden center business have historically been focused more on in-person interactions than they have been on robust websites for their businesses.

“For a lot of garden centers and nurseries, there's just not a focus or interest in technology,” said Ron McCabe, president of Everbearing Services, a Portland, Oregon marketing agency that specializes in the horticulture industry. “They'd rather be out in their garden or in the nursery.”

While there's still some truth to that, there's no denying that the demand for online shopping for just about anything has picked up as the technology and customer experience have improved. That's also been evident in the garden center and retail nursery sectors, which have long been fueled by in-store and hard copy catalogue transactions.

“The traditional catalog ordering demographic is older, but now we've got this big influx of young people into the space,” said Megan Hansen, founder of Plant Lust, an online marketplace where nurseries can either list information and inventory or even sell products to consumers. “A lot of nurseries didn't have websites or e-commerce. It was expensive and it's not their core skill set. But we've got this big influx of young people who are into gardening. Those people are not going to paper. They're looking for

things that are on social media and mobile.”

There are barriers, however. Cost is a big one, and not just for creating a website with an online shopping component, but maintaining it as well.

Maurice Horn, co-owner of **Joy Creek Nursery** in Scappoose, Oregon, said his nursery started out as a mail-order business that only slowly grew to offer a retail component. Eventually, the nursery put up a fairly simple mail-order website that showed which plants were in stock and let consumers make purchases online. Later, they worked with a company to develop a more sophisticated site, but it became too costly to ever launch.

“Our well ran dry,” Horn said. “We needed to keep the plants alive.”

Other challenges

Brent Markus owns **Conifer Kingdom**, a Silverton, Oregon-based

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conifer nursery that sells largely online. He's been through three online shopping platforms and five website redesigns since launching in 2012, and he's about to switch to a fourth platform.

He said in addition to the costs of launching and maintaining a site, plant inventory sales can be more complicated than products in other industries. For example, with plants you also have to consider things like pot size, a plant's height in the pot and other factors.

And then there's shipping.

"It's difficult to ship perishable goods, period," Markus said.

Some garden center and retail nurseries may also have been reluctant to fully embrace the web for fear that they'd be cutting down in-person visits to their locations, thus missing out on potential sales. McCabe said those fears are largely

unfounded if the center or nursery offers a pickup service.

"That way you still get them to come into the store," he said.

There also may be some reluctance to direct customers online because the experience might not be as enjoyable as coming into a store and talking to a knowledgeable, well-trained staff member. Raisch said people do enjoy coming into garden centers and nurseries — folks visited them immediately after the September 11, 2001 terrorist attacks for a sense of peace, he said — but there are lots of companies who've perfected the online shopping experience. One in particular: Amazon.

"There's a customer experience there, and it's really not that bad," he said.

"They value engineer and design the experience in such a way that it doesn't really have many problems."

Shock to the system

If nurseries and garden centers had been reluctant to hop fully online, the shock of COVID-19 might have been just the jolt they needed to finally make the leap.

With so many people sequestered in their homes and reluctant to go out during the pandemic, offering an online shopping option might be the only way customers will connect and buy from nurseries

"This is forever going to change the horticulture industry, because the clients are going to change how they buy things," McCabe said. "Right now, the holdouts are going to be forced to buy online, so the bare minimum is, it will become another option for people to get plant material."

Fortunately, new options, technologies and programs have arisen that can help get nurseries online in a hurry and help them stay afloat through the current crisis. >>



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Up and running — online

Hansen's platform, Plant Lust, is free for nurseries who want to list inventory and information. Customers can search the site for specific plants — it currently lists between 40,000 and 50,000 plants from close to 120 nurseries — and see where they can locate them. There's also a sales platform for nurseries who want to sell plants.

McCabe's firm recently worked with Oregon grower **Little Prince of Oregon Nursery** to launch Garden Center 911, an online referral program to help garden centers recover lost revenue due to the spring slowdown. Garden centers get a referral link that goes to the Little Prince of Oregon Nursery online store; they can share that link through social media channels and get 20% of the purchase price of each referred sale.

The tech firm SBI Software, which specializes in supply chain management software for the green industry, has kicked off a national website called **noncontactplant-pickup.com**. Through it, customers can find plant retailers, order and pay online and pick up their order at the center without ever having to come into contact with someone in-person. On top of that, the site pledges a half-percent of each sale to the World Health Organization's COVID-19 Response Fund.

"I think with everything that's happened, I'm feeling pretty fortunate that the green industry has remained strong and that, in this time of uncertainty, people are staying home and thinking about what they want to matter," Markus said. "They're thinking about their landscapes, you know? They're excited about the prospect of planting a new tree, more so now than any time I've been in the business. The only thing that's certain right now is that everything in the world has changed over the last few months, and that's bringing a whole new dynamic to everything." ©

Jon Bell is a freelance journalist based in Oregon who writes about everything from craft beer and real estate to the great outdoors. His website is www.jbellink.com. He can be reached at jontbell@comcast.net.

Ribes sanguineum is a great native plant that also feeds pollinators.

PHOTO COURTESY OF GREAT PLANT PICKS

Plants for a better planet

PLANTS FOR A BETTER PLANET



Great Plant Picks is a Northwest-based nonprofit educational program from the Elisabeth C. Miller Botanical Garden. For more information, go to www.greatplantpicks.org.

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EDWARD GOUCHER ABELIA

Arbutus unedo
STRAWBERRY TREE

NATIVE



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MONROE CUTLEAF VINE MAPLE

Actaea rubra
RED SANDSBERRY



Daphne x transatlantica
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Calceolus decorus
LINCENSE CLEW



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LORD BYRON HARDY FUCHSIA

Rosa 'Seagull'
SEAGULL RAMBLING ROSE



Mullein 'Ben Nevis'
BEN NEVIS ROCK ROSE

Ceanothus saffordii 'Repens'
SPREADING WILLOWLEAF COTONWAST



Thuja occidentalis
MOUNTAIN HEMLOCK

Ribes sanguineum
FLOWERING CURRIANT



Composita 'Birch Hybrid'
BIRCH'S BELLFLOWER

Sedum 'Mexican Sedum'
MEXICAN SEDUM



Helleborus 'Stern's Hellebore'
STERN'S HELLEBORE

Juniperus chinensis 'Kobold'
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Erythronium oregonum
GIANT WHITE FAWN LILY

Polypodium glycyrrhiza
LICORICE FERN



Garrya 'Renard's Garrya'
REWARD'S GARRIYA

Clematis 'Tetradis'
TETRADIS CLEMATIS



Osmunda 'Variegata'
VARIEGATED FALSE HOLLY

Crocus 'Goldlocks'
GOLDBLOCKS CROCUS



Iris 'Tough Leaf'
TOUGH LEAF IRIS

Pinus contorta var. contorta
SHORE PINE

Great Plant Picks program highlights selections that perform consistently in the Pacific Northwest

BY RICHIE STEFFEN

OVER THE LAST several years, many areas around the country have experienced prolonged droughts, excessively hot temperatures, and a noticeable decline in the population of pollinators. No one can deny that planting to increase insect diversity and lower water use is a good idea.

This year, the Great Plant Picks (GPP) education program is focusing on plants that improve our environment by highlighting those that are drought-tolerant, encourage pollinating insects, and garden-worthy natives of the Pacific Northwest.

GPP is the leading educational outreach program of the Elisabeth C. Miller Botanical Garden. The program began in 2000 with the goal of selecting a palette of plants that are consistent, reliable performers for the maritime Pacific Northwest.

An expert panel serves as the selection committee. These volunteers come from a diverse horticultural background and represent years of practical hands-on experience in the region. Committee members consist of retail and wholesale nursery representatives, garden designers, landscape architects, city park employees, arborists and representatives of public gardens.

Since the start of the program, more than 1,000 plants have been selected focusing on all kinds of garden and landscape situations. GPP selections are



PHOTOGRAPHY: Blooming Nursery, Great Plant Picks, Rick Peterson, Richie Steffen, T&L Nursery

www.greatplantpicks.org

This poster has been produced in partnership with Pacific NW magazine and The Seattle Times. Great Plant Picks is administered by the Elisabeth C. Miller Botanical Garden.

Plants for a better planet

(Left) A detailed view of *Ribes sanguineum* blossoms. (Right) *Camassia quamash* are native bulbs that can be found on Oregon Garden grounds. PHOTOS COURTESY OF GREAT PLANT PICKS

not necessarily the newest cultivar or variety but are the best performing selections available to the Northwest gardening community.

GPP has an extensive listing of plants that are well adapted to the modified Mediterranean climate of western Washington, Oregon and southwest British Columbia. Many of these choice ornamentals require little water once established. As water becomes more expensive in urban areas and restrictions on its use become more prevalent, native plants have become a useful alternative.

Some classic natives

A popular and easy place for nurseries and garden designers to connect with customers is to praise the virtues of our most garden-worthy West Coast natives.

Four classic natives that have proven ironclad in the landscape are *Acer circinatum* (vine maple), *Vaccinium ovatum* (evergreen huckleberry), *Mahonia nervosa* (Cascade Oregon-grape) and the beautiful early flowering *Ribes sanguineum* (flowering currant). These four natives are well behaved, easy to grow and provide food and shelter for wildlife, especially our native pollinator insects.

Of course, there are many more natives on the GPP website that fit well into a drought tolerant garden and often when we think of natives we immediately go to native trees and shrubs, but there is so much more that we can grow. One of



most overlooked groups are native bulbs.

Several species of camas are native to the Northwest and form impressive stands in the wild during April and May. The tall flower spikes with their unique purple-blue coloring are as showy as any tulip and much more apt to return year after year.

Camassia quamash, tends to grow a little shorter than the other species with flowering stems 12 to 18 inches tall. There are a few selections of these species commercially available with 'Orion' being

offered most often. 'Orion' is a robust grower with flowers nearly a midnight blue in color.

The taller growing *Camassia leichtlinii* ranges from 24 to 36 inches tall, typically lavender-blue. The cultivar 'Cerulea' has sky blue flowers on tall, strong stems. Once established these bulbs will produce full clumps and can reseed if allowed. Once introduced to the garden they will be a long-lasting perennial bulb. They will grow and flower best in full sun but >>

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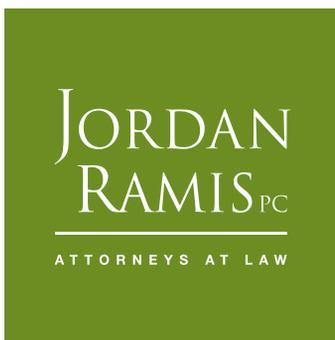
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Plants for a better planet

(Top) NW Gardeners Nursery offers the late blooming *Triteleia ixioides*. (Bottom) Pollinators love trees like *Acer japonicum* 'Aconitifolium'.

PHOTOS COURTESY OF GREAT PLANT PICKS

can tolerate some light or open shade.

Another great group of western native bulbs has been confused with name changes coupled with a host of common names. What was once the genus *Brodiaea* is now divided into three separate genera, *Triteleia*, *Dichelostemma*, and *Brodiaea*.

All these genera bear their flowers on tall thin stems with a cluster of flowers on top in a loose umbel. These are generally late spring bloomers with the foliage emerging in late winter and withering into dormancy as the flower stems develop. Fortunately, the foliage is fine in texture and the withered leaves do not detract from the beauty of the flowers.

Triteleia 'Corrina' and 'Queen Fabiola' are widely available with flowers on stems 8 to 12 inches tall in rich purple tones, while *Triteleia ixioides* blooms a bright golden yellow on shorter stems 6 to 8 inches tall.

One of the most unusual and eye-catching flowers can be found on *Dichelostemma ida-maia*, the firecracker flower. Very tall, wiry stems reach 24 to 30 inches and are topped with hanging tubular flowers in bright red. Native to Northern California, it is found in sunny, dry slopes with the stems poking up through low shrubs and grasses.

Non-natives for pollinators

Native plants are ideally suited to native pollinators, but few of them are exclusive about their source of food. Non-invasive exotics can and should be an essential way we diversify our landscapes for pollinating insects.

Many common non-native plants are proven garden performers and excellent pollinator supporters. These non-natives can provide an important food source at times of the year when pollinators are active, yet native flowers may be scarce.

Through thoughtful selection, many of these plants can be chosen for good drought tolerance and pair well with natives. Early bloomers like *Mahonia* × *media*, *Osmanthus* × *burkwoodii* and *Berberis darwinii* add an additional food source in urban areas where early bloom-



ing natives like *Oemleria cerasiformis* (indian plum) and *Rubus parviflorus* (thimbleberry) are not as common.

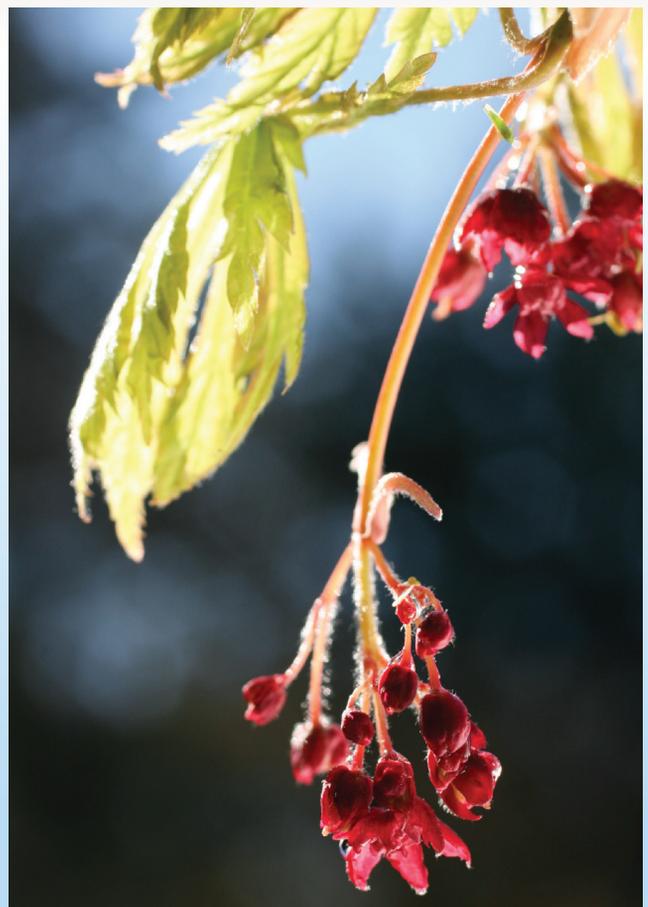
The flowering season can also be stretched well into the fall with plants like *Osmanthus heterophyllus* (sweet olive) or *Arbutus unedo* (strawberry tree). The *Osmanthus* has tiny flowers that pack a powerful sweet fragrance that cannot be missed by bees or people and there are several cultivars like 'Variegatus' and 'Purpurea' that have colorful foliage.

Arbutus unedo produces long-lasting clusters of white urn-shaped flowers well into autumn. If given a mild winter, these flowers will develop into brightly colored orange and red fruits. Both plants have excellent drought tolerance and once established need little care.

In areas where water can be provided during prolonged dry periods, plants with an extended blooming season can be considered. Long bloomers are a magnet for bees,

butterflies and hummingbirds for months on end.

One of the most floriferous of the long bloomers are the hardy fuchsias. The Northwest is an ideal climate for these exotic and beautiful sub-shrubs with dozens that will flourish in our maritime climate. Some of the hardiest are the *Fuchsia*



magellanica selections and cultivars.

Fuchsia 'David' had tremendous flower power on a well-branched plant that is covered in flowers from mid-summer to late autumn with small, bright red, pendulous flowers with a royal purple center.

Fuchsia magellanica var. *molinae* 'Alba' is not white as one would expect, but a lovely pale bluish pink. This is one of the hardiest of the hardy fuchsias and one of the most vigorous cultivars available. In protected locations it can reach heights of 10 to 15 feet with hundreds of blooms over the season.

Fuchsia 'Hawkshead' is the closest you can get to a hardy pure white with gleaming pale blooms touched with just a hint of pink and green on the sepals. If you want something really bright, *Fuchsia magellanica* var. *gracilis* 'Aurea' is the fuchsia for you. Acid yellow foliage shines in full sun that will tone down to a bright chartreuse in partial shade. The red and purple flowers contrast brilliantly with the glowing leaves.

Trees that help pollinators

We do not often think of the average tree as providing food and habitat to pollinators unless we see it loaded with blooms. Ornamental cherries, magnolias and dogwoods would top this list, but when you realize that one of our prominent natives, *Acer macrophyllum*, or bigleaf maple, is insect pollinated you begin to see the hidden value of many ornamental trees.

Some of our most ornamental maples such as *Acer circinatum*, *Acer japonicum* and *Acer palmatum* all lure bees and other pollinators to their petite but nectar-rich flowers.

Linden trees are known for attracting masses of bees to pollinate their copious yet subtle flowers. If you want to create a beacon for pollinators, plant the large, beautiful, and aphid-resistant selection *Tilia tomentosa* 'Sterling', or Sterling silver linden. The fragrant flowers are partially hidden from view but can attract so many bees the tree



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Plants for a better planet

Hardy to Pacific Northwest winters, Joy Creek Nursery offers *Fuchsia magellanica* var. *gracilis* 'Aurea'. PHOTO COURTESY OF GREAT PLANT PICKS

will hum with the sound of their wings and the deep green leaves have a silvery-white underside that flashes with brilliance at the slightest breeze.

There are also many trees suitable for a smaller urban garden. *Cornus mas*, *Crataegus × lavallei*, *Koelreuteria paniculata* are three less commonly used species. All three tolerate tough city life in poor growing conditions yet can provide an essential food supply for pollinators in a concrete jungle.

Cornus mas (cornelian cherry) is tolerant of drought and is the first dogwood to bloom in late winter with clusters of small golden yellow flowers covering the branches.

Crataegus × lavallei (Lavalle's hawthorn) is another extremely tough tree with white flowers in the spring that bees find irresistible. In late summer and early fall bright, red marble-sized fruit develop and colorfully hang on the tree until mid-winter.

Koelreuteria paniculata (golden rain tree) produces beautiful sprays of tiny yellow flowers in mid-summer. Later in the season they are followed by unusual balloon-like seed pods.

Where to learn more

All of these plants and much more can be found on the GPP website (www.greatplantpicks.org) It is easy for us to think of our landscapes and gardens as a part of a greater ecosystem.

With little effort we can add an array of plant material that is not only beautiful but works towards a better planet. ☺

Richie Steffen serves as the execu-



tive director of the Elisabeth C Miller Botanical Garden in Seattle, Washington, and oversees the Great Plant Picks educational outreach program. He can be reached at richies@millergarden.org.



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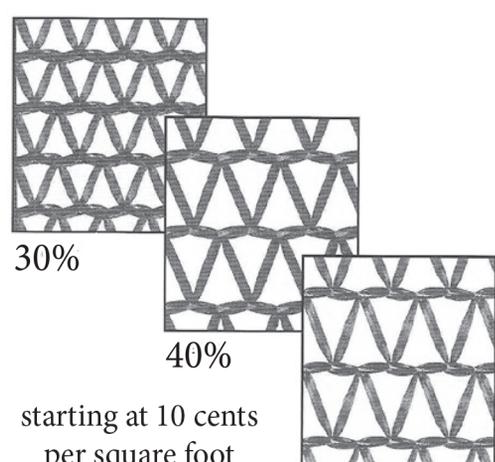
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A helper for plant roots

Mycorrhizae use in nursery and greenhouse production can enhance nutrient absorption and plant growth

BY GRAHAM HETLAND

MYCORRHIZAL FUNGI ARE beneficial microscopic soil organisms that have evolved in a symbiotic relationship with approximately 95% of the world's plant species over the past several hundred million years. These fungi predate the evolution of terrestrial plants, and it was the partnership with mycorrhizal fungi that allowed plants to begin to survive on dry land and ultimately lead to life on Earth as we know it.

Although these beneficial soil organisms have been a bit of a buzzword in the horticulture world over the past few years, mycorrhizae are not new; in fact, they have been around for hundreds of millions of years, quietly doing their important work beneath our feet.

The relationship between plants and mycorrhizal fungi is a two-way relationship of sharing resources between species, thus a classic symbiotic mutualism. The endomycorrhizal fungi rely on the plant to survive, and the plant's performance and survival are enhanced by these beneficial fungi.

Mycorrhizae act as a living extension of the plant's roots and benefit a plant's root system development, nutrient and water uptake and efficiency, stress tolerance, and transplant success. For a professional grower, mycorrhizal fungi can shorten crop times, improve plant uniformity, reduce nutrient runoff, allow for longer watering intervals, add to transport and retail resiliency, and improve soil quality and health.

The per-plant investment can be as little as \$0.0002 - \$0.0008 when treated early in the plant's life cycle. Inoculating horticulture crops with mycorrhizal products provides an inexpensive insurance policy. Once the plant root system is colonized by the mycorrhizal fungi, this symbiotic relationship lasts the lifetime of the plant as the mycorrhizal hyphae continue to grow along with the roots.

With recent advancements in formulations and carrier technologies, professional horticulturists can easily incorporate mycorrhizae into their growing protocols.



A helper for plant roots

(Previous page) Blooming Nursery in Cornelius, Oregon held a trial for mycorrhizae fungi. PHOTO COURTESY OF MYCORRHIZAL APPLICATIONS

Selecting the right type of mycorrhizal product

With all of the mycorrhizal inoculum options currently on the market, selecting the best mycorrhizal product for growing operations is very important, as not all products will work for all plants and crop types, and not all products are created equal.

First, there are two different major types of mycorrhizal fungi that are commercially available: endomycorrhizae and ectomycorrhizae. A brief overview of the mycorrhizal fungi types are in chart 1 (right).

In general, most greenhouse ornamental crops (and vegetable crops) will require endomycorrhizae only, however, some nursery growers can benefit from both endomycorrhizae and ectomycorrhizae, if they are growing a combination of flowering ornamental plants as well as woody shrubs, nut trees, or conifers. Christmas tree producers or forestry nurseries will

Two major types of mycorrhizal fungi

Endomycorrhizae

- Form symbiotic relationships with approximately 85% of plant families.
- Pair with most commercially produced plants, including green, leafy, and fruiting or flowering plants.
- Penetrate into the root cortex and form nutrient exchange structures within the root cells (arbuscules, vesicles, etc.)

Others

- Brassica family is non-mycorrhizal
- Ericaceae and Orchids have specific species of mycorrhizae (less commercially available)

Ectomycorrhizae

- Form symbiotic relationships with approximately 10% of plant families.
- Mainly pair with conifers and many American hardwoods.
- Do not penetrate into the root cell walls, but form a sheath around the root, and nutrient exchange structures known as "Hartig net."

require only ectomycorrhizae for their crops.

Some products on the market contain endomycorrhizae only, some contain both endo and ecto, and some contain ectomycorrhizae only. Selecting a product that

contains only the mycorrhizal type(s) that an operation need will help ensure the success of the inoculant and help to ensure a return on investment.

Another major consideration when

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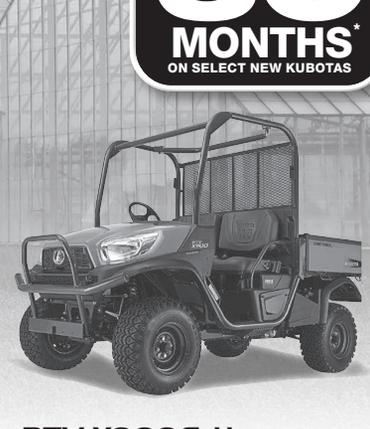
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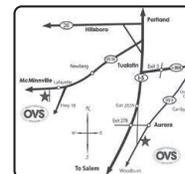
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Apple trees respond well to mycorrhizae fungi. PHOTO COURTESY OF MYCORRHIZAL APPLICATIONS

selecting the optimal mycorrhizal product is the diversity of mycorrhizal species that are included. The growing media or soil within the root zone is an ecosystem, and just as it is with any ecosystem, species diversity is important. Some products on the market include only one mycorrhizal species, while others contain as many as nineteen mycorrhizal species.

These different mycorrhizal species provide distinct benefits to the plants under varying circumstances, different forms of plant stress, and through different stages in the growing season and plant life cycle. As a general rule, greater species diversity will provide a wider and more complete range of benefits from the mycorrhizal symbiosis.

Horticulture application options

With the various mycorrhizal inoculant formulations now available in the horticulture market, there are a large variety of options for professional growers to effectively inoculate ornamental crops with these beneficial symbiotic soil organisms. In the past, mycorrhizal inoculation often required an additional step in the production protocol, which could be time consuming and labor intensive. These days, many products on the market are designed to eliminate extra steps and make the process as smooth and efficient as possible, at any stage in the production process.

The key to applying mycorrhizal products is to make physical contact between the product and the growing or emerging roots. The closer the active ingredient is placed to the roots or seed, the faster and more effectively the symbiosis will be established. In order to accomplish this, growers have several options: soil/media incorporation, tray dip, bare root spray or dip, or soil/media drench (via spray, sprinkler irrigation, drip irrigation, watering can, or any way to get a thorough drench of the root system and move the active ingredients in to the root zone).

The most cost-effective and efficient stage in the plant production process to apply a mycorrhizal inoculant is during propagation, or as early as possible in the production process. This way, growers are

treating the minimum soil volume, which will require less inoculant product per plant. And as the plant grows and is transplanted for finishing and then ultimately outplanted in a landscape, installation, basket, etc., the mycorrhizae will continue to grow in the larger soil volume along with the plant's roots, and ultimately out into the nutrient depletion zone that roots alone cannot access.

For medium or large-scale growers, the most efficient application method is generally to drench plugs or propagation trays using a highly concentrated suspendable product that is suitable for application

through a horticulture injector system. This way, the product can be applied via irrigation, boom spray, drip, etc., and can often be included along with the application of another input such as liquid fertilizer, which completely avoids the need for any additional steps or input applications in the



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A helper for plant roots



New Guinea impatiens on the right were treated with mycorrhizae. PHOTO COURTESY OF MYCORRHIZAL APPLICATIONS

production protocol.

Alternatively, for growers who mix their own propagation media, there are granular products on the market that are ideal for mixing with soil or media, which can also be a very cost-effective and efficient way to give plants a boost.

Contact a distributor

Mycorrhizal fungi are the most well-researched soil organisms on the planet, and the benefits that they provide to plant vigor, growth, and productivity are extremely well documented.

Professional mycorrhizal inoculant

products are available from most major greenhouse and nursery distributors throughout Oregon and the rest of the U.S. For more information, and most horticulture distributor sales representatives and websites will be able to point you towards the options that they offer. ©

Graham Hetland is the product and communications

manager at Mycorrhizal Applications, based in Grants Pass, Oregon. He holds a bachelor's degree in environmental studies as well as an MBA from Southern Oregon University. He can be reached at graham.hetland@mycorrhizae.com or 541-476-3985.

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EMPLOYMENT

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(continued next column)

EMPLOYMENT

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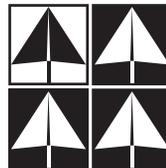
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**Nursery
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GROWING KNOWLEDGE

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

A new breed of Norway maples

An update on efforts to grow sterile cultivars of this important shade tree for Oregon growers

BY RYAN CONTRERAS AND TYLER HOSKINS

THE NURSERY INDUSTRY in the Pacific Northwest markets a great deal of plant material to the upper Midwest and New England. Overall, Oregon ships 75% or more of its nursery plant material out of state. Shade trees are among the most important plants marketed to these areas, and nationwide, Oregon accounts for nearly a quarter of the total deciduous shade tree sales.

Historically, American elm (*Ulmus americana*) and ash (*Fraxinus* spp.) have been principal trees in the urban canopy, making them trees of great economic importance to the nursery industry. However, the emergence of Dutch elm disease and, more recently, emerald ash borer have reduced the viability of American elm and ash.

Norway maple (*Acer platanoides*) has been an important staple shade tree that could be reliably used as an ash alternative. Norway maple grows well under a wide range of conditions, including sand to clay soils and acid to calcareous soils. It is hardy to USDA Zone 4 and tolerates heat, drought, and compacted soils common in urban settings. Furthermore, Norway maple is tolerant of air pollution — ozone and sulfur dioxide in particular — making it ideal for use as a street tree.

However, Norway maple has naturalized in forests of New England. As a result, its planting has been essentially eliminated in these states, including bans in Connecticut and Delaware.

We have been breeding for sterile forms of Norway maple by developing triploids (Contreras, 2017). These would benefit the nursery industry by allowing these cultivars to be marketed in areas where its planting has been reduced due to the tree's weediness.

Breeding with two goals in mind

At Oregon State University, the Corvallis, Oregon site where we conduct our breeding work on maples has what appears to be a substantial infestation of verticillium wilt. We did not know about this when the plants were first planted.

After one to two years in ground, we observed trees beginning to decline; some died. Importantly, we observed some trees with less or even no symptoms of wilt. We have since focused our seed collection on these superior tetraploids as poten-



Figure 1. Triploid selection of *Acer platanoides* growing at the Lewis-Brown Horticulture Farm in Corvallis, Oregon. This selection and others will be used in rooting studies to evaluate stock plant handling techniques to optimize cutting propagation. PHOTO BY RYAN CONTRERAS

A new breed of Norway maples

tial sources of resistance to verticillium. Additionally, since confirming the causal agent as verticillium, we have discarded seedlings that appear to be infected.

Breeding work continues on both goals — sterile triploids, and resistance to verticillium wilt. We are making positive progress on both fronts.

Currently, Norway maple cultivars are primarily propagated by budding onto seedling rootstocks. However, this method of propagation is largely incompatible with our breeding goals. To facilitate reintroduction of Norway maple into regions where it has been banned, it will need to be propagated on its own roots. This is because the fertile seedling rootstock would represent an opportunity to escape cultivation due to outgrowth of the rootstock and/or failure of the scion that would lead to stump sprouts and ultimate-



Figure 2: *Acer platanooides* cuttings four weeks after sticking during the 2019 study. All cuttings were 2-node, sub-terminal cuttings treated with 16,000 ppm IBA-talc. PHOTO BY TYLER HOSKINS

ly a fertile flowering tree.

Furthermore, we are breeding for resistance to a soilborne pathogen (verticillium wilt) and it does little good to introduce a resistant cultivar (scion) only to be budded onto a susceptible seedling rootstock.

Propagation from stem cuttings is feasible and widely practiced in other maples, such as red maple, to avoid graft

incompatibility. In Norway maple, cutting propagation is not widely used due to its difficulty and low success rate.

In 2007, Wolfgang Spethmann, professor at the University of Hannover in Germany, reported success using 70-90cm cuttings treated with 5,000 ppm indole-3-butyric acid (IBA) under high-pressure fog. This method may be useful to >>>

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A new breed of Norway maples

propagate relatively small numbers, but using this size cutting does not lend itself to efficient production.

We have ongoing studies to optimize cutting propagation using more traditional sized cuttings and in preliminary studies from 2018, we had up to 60% success. During that year, we collected cuttings in August while the shoot meristems were active.

Cuttings were treated with a wide range of IBA forms (talc, quick dip, foliar, and long basal soak) and we also separated into terminal vs. sub-terminal cuttings. From that study, the best results were found in terminal cuttings treated with 16,000 ppm IBA-talc and subterminal cuttings treated with 1,000 ppm IBA foliar spray. Both of these treatments resulted in 60% rooting — but this preliminary study was conducted on small numbers of cuttings (Chart. 1). Overall, subterminal cuttings had better success than terminal cuttings across IBA application methods and rates and produced a more robust root system.

In 2019, we focused on using two

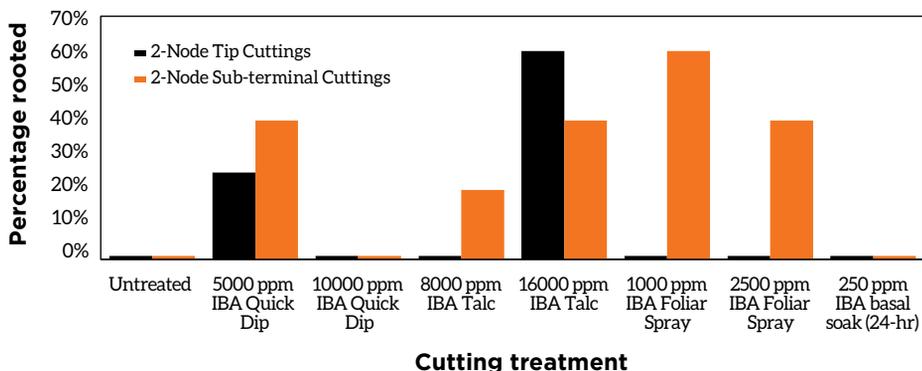
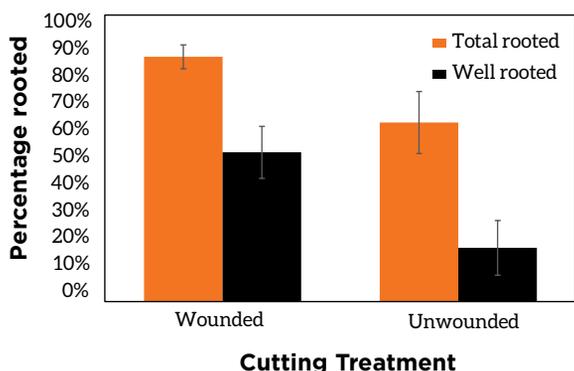


Chart 1. (Above) Preliminary results of an August 2018 cutting trial of *Acer platanoides*, in which 2-node tip and sub-terminal cuttings were treated with various rates and application methods of rooting hormone.

Chart 2. (Left) Rooting success of 2-node sub-terminal *Acer platanoides* cuttings that were collected during August 2019 and treated with 16,000 ppm IBA-talc and were wounded or left unwounded.



node subterminal cuttings treated with 16,000 talc and compared wounding vs. unwounded cuttings — again collected during August when meristems were active. Wounding improved rooting and resulted in 85% overall rooting compared to 63% in unwounded (Chart 2). Visually, wounded cuttings had superior root systems (Figure 2, page 36). These results are encouraging and provide a basis for the next phase of research.

The 2018 and 2019 studies were performed on seedling rootstocks. It is well-established that juvenile plants have greater capacity for adventitious root formation and mature cultivars will likely prove more challenging due to reduced regeneration potential associated with adult plants. With that in mind, we will continue trying to optimize cutting propagation of mature cultivars by manipulating stock plant handling, timing, and hormone applications.

In 2020, we will collect cuttings from several superior forms of triploids that have potential as future releases (Figure 1, page 35) and compare to several industry standards.

Take-aways from 2018, 2019 studies

Sub-terminals responded best overall (especially on cuttings of a thicker caliper). 16,000 ppm IBA-talc produced the best quality roots with foliar IBA being a close second.

Wounding of sub-terminal cuttings produced a nice improvement in both the total number rooted and the number of those with robust root systems.

Primary question for the future

Will these methods translate to industry standard cultivars and any forthcoming sterile cultivars? We will repeat some of the more promising methods using several industry standard cultivars and several of the triploid selections in development at OSU.

Will rooted cuttings finish the production schedule on time? Rooting is important but timing must work out for commercial production. To address this question, we will work with Dr. Lloyd Nackley, nursery production researcher, to conduct formal studies in partnership with commercial nurseries to compare production scheduling between budded plants and rooted cuttings.

To view our ongoing breeding efforts in Norway maple or for a tour of the breeding program, please contact either of us. We'd love to have you. ☺

Ryan Contreras is an associate professor of ornamental plant breeding at Oregon State University. He can be reached at ryan.contreras@oregonstate.edu. Tyler Hoskins is a faculty research assistant at OSU. He can be reached at tyler.hoskins@oregonstate.edu.

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Spethmann, W. 2007. Increase of rooting success and further shoot growth by long cuttings of woody plants. *Propagation of Ornamental Plants* 7:160-168.

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