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COVER PHOTO: The Olympic Club, San Fransico, California

NORCALENDAR

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Monday, May 13 17th Annual Clifford & Myrtle Wagoner Scholarship & Research Tournament Peninsula Golf & Country Club

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President's Message

By STEVEN SPATAFORE, Golf Course Superntendent, Contra Costa Country Club

Happy New Year to All-

The rain has frequently been falling at Contra Costa Country Club turning the clay soils under my fairways into a mushy mess where no mowers, let alone carts, dare to go near. And yet, the grass keeps growing and the golfers keep golfing. I hope that each of you are able to take some time during this rainy season to breathe, get away from the golf course, and spend it with friends and family.

One of my favorite things about the rainy season is the opportunities it provide us to reflect on the successes of the past year and plan for the year to come. I hope that you will make the GCSANC part of your plan for the coming year. This year is chalk full of great education and networking opportunities for you and your staff. We held our annual Affiliates Breakfast at Lake Merced Country Club in mid-February, and soon thereafter hosted a very successful Assistant Superintendent Boot Camp at Bayonet and Black Horse.

Upcoming events include our USGA Meeting at Olympic Club on April 15 and our 17th Annual Clifford & Myrtle Wagoner Scholarship & Research Tournament on May 13 at Peninsula Golf & Country Club. Be sure to sign up today for both events!

Lastly, I hope that you will make donating a 4-some for "Rounds for Research" a part of your plan for the 2024. This auction, held annually and conducted by the GCSAA, provides us a great opportunity to raise funds for our local chapter. 80% of the funds raised are returned to our chapter and help to finance numerous important programs at the local level. The money raised have helped to fund research conducted by Dr. Jim Baird at UC Riverside focusing on water conservations programs, warm season breeding, nematode control, fungicide development and evaluations. Support has been provided to Oregon State University to fund their aerification and cultivation research. Click Here to donate your round anytime between now and the auction which runs in late April.

I hope that each and every one of you have an excellent 2024. I look forward to seeing each of you at events this coming year.

Sincerely,

Steven A. Spatafore Golf Course Superintendent Contra Costa Country Club



From the Field

By JEFF JENSEN, GCSAA Field Staff, Southwest Region

Thank you to all the GCSA of Northern California members that attended the GCSAA Conference and Show in Phoenix. Your support created an extraordinarily successful show that will assist in moving the association and industry forward.

The show drew 11,000 attendees spanning 352,000 square-feet of exhibit space and 470 vendors (which marked a complete sell-out of show space). Over 6,600 education seats were sold for the event, the highest since 2008.

While there was too much going on to cover in this column, a few highlights stood out that I wanted to share:

- Jeff White, CGCS at Indian Hills Country Club in Mission Hills, KS., was elected President of GCSAA. T.A. Barker, CGCS was elected Vice President and Paul Carter, CGCS, was elected Secretary/Treasurer. Incumbents Doug Dykstra, CGCS, and Marc Weston, CGCS, were re-elected to the board and Greg Jones, CGCS, MG, was elected a new board member.
- Mike Hoffman, retired Chairmen and CEO of the Toro Company donated \$1 million to GCSAA's First Green Program. The Mike and Tami Hoffman "STEAM Ahead" Initiative will fund the addition of arts to First Green, which will elevate it from a STEM curriculum to a STEAM (science, technology, engineering, art, and math) curriculum.

- The Cal Poly Pomona Turf Team finished ninth in the annual Turf Bowl. 63 teams participated in the event. Congrats to the Cal Poly students and advisor Brian Fuertes for the top-10 finish.
- Seth Strickland, Superintendent at Miami Beach Golf Club won the GCSAA National Golf Championship posting a two-day total of 6-under par 138. It marked the sixth time that Strickland has captured the championship. The GCSAA Golf Championships had 638 competitors split up over three 36-hole facilities in the Phoenix/Scottsdale area.
- CBS Sports golf reporter Dottie Pepper received the annual Old Tom Morris Award. The award is presented to an individual who, through an enduring lifetime commitment to the game of golf, has helped shape the welfare of the game. See a great clip from Jim Nantz discussing the award with Dottie at https://x.com/GolfonCBS/status/1753929933074641391?s=20

We appreciate your continued support of the GCSAA Conference and Show and Golf Championships. We look forward to heading back to San Diego in 2025 and we have some wonderful things in store including golf at Torrey Pines!

As always, if I can be of any assistance, please do not hesitate to contact me at jjensen@gcsaa.org and follow me on Twitter at GCSAA_SW for industry updates.

Jeff

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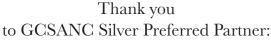




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Assistant Superintendant Profile: Derick Mara Mayacama Golf Club

It's always great to showcase some of the up-and-coming talent in our industry. Southern California has some of the richest history in golf, with great courses and hardworking crews that keep them in exceptional condition. For this issue, we interviewed..., Assistant Superintendent at..., in....

What made you decide to get into golf maintenance?

In high school, I was on the golf team and developed a passion for the game. My high school had an externship program for seniors. This program allowed seniors to spend the afternoon working in the field in which they were going to major in. I spent every afternoons with the Superintendent at Gardner Municipal Golf Course, Bill Frank, and gained serious interest in the industry.

What is your proudest accomplishment in the industry?

Seeing the people you have mentored move up through the industry and have success.

Who would you consider your most influential mentor in the industry?

I have been fortunate to learn from 3 great Superintedents, Kevin Banks at Vineyard Golf Club, John Nachreiner at Shady Canyon Golf Club, and my current boss Dale Engman.

Where did you grow up?

Gardner, Massachusetts

Your best Nicknames?

In high school my nickname was Mayor Mara. I always liked planning things to get friends together and was voted most school spirit my senior year.

If you could drive any vehicle, what would it be?

A Land Rover Defender from the 1990's.

Curly fries or regular, and why?

Regular fries. If curly fries aren't cooked correctly, they can be soggy in spots. That's a risk I'm not willing to take.

What is the funniest thing you have ever seen on a golf course?

In highschool I watched a buddy fall into a pond after trying to hit a shot off a pond bank. It was a steep slope and his back foot slipped out on his down swing and it was like a slow motion stumble into a splash. The best part is, the ball rolled down into the water with him after he topped it.



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What is one thing that most people don't know about you?

I have never drank a soda in my life.

What was your lowest score playing golf, and where?

71 - Edgartown Golf Club

What is your favorite manual labor job on the golf course and why?

Laying sod, its rewarding to see the finished product after an area needed replacement.

Greatest piece of advice anyone has given you?

Grudges seldom hurt anyone except the one bearing them.

If you had to survive on a deserted island for 1 year, aside from food and water, what 5 items would you bring with you to occupy your time?

Golf Clubs (bunker game would be dialed in), dumbbells, snorkel gear, mountain bike, boogie board

Favorite Beer?

Hazy IPA

If you had your choice, what would you do in retirement?

Travel the world golfing, hiking, and exploring all the diverse cultures that the world has to offer.

Favorite sports teams?

All Boston Sports teams, Patriots, Celtics, Red Sox, Bruins.

What's your favorite type of grass to manage as a putting surface and why?

Bentgrass is the only grass I have managed on a putting surface, but I also find it to be the best. I find it to be the smoothest putting surface from a playability standpoint.

If you could have lunch with anyone, past or present, who would it be and why?

Tom Brady because he is my all-time favorite athlete.

What is your favorite golf maintenance related quote?

If you don't have time to do it right, when will you have time to do it again?

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Rise of the Machines — Autonomous Mowers on Golf Courses

By CORY ISOM, Agronomist, West Region

KEY TAKEAWAYS:

- Autonomous mower technology is rapidly improving.
- Small, rotary-style autonomous mowers typically used for home lawns are now being used on golf courses.
- Large-area, reel-style autonomous mowers are still not commercially available in the U.S.
- Regulatory issues around safety and liability will need to be solved before widespread adoption of autonomous mowers happens on golf courses in the U.S.

I magining what future technology looks like has been part of literature and motion pictures for decades. Scenes of robots performing normal and not-so-normal tasks make us wonder if those visions will ever be a real thing in our lives. Recent advances in technology have brought us little robots that automatically vacuum your floors, autonomous tractors for agriculture and early versions of self-driving cars. The idea behind all these innovations is to improve efficiency and performance while giving us nonrobots more time to do other things. If I don't have to be vacuuming, plowing my field or driving my car to work, I'll have more time to do what I want. There is also a strong possibility that a robot might make fewer mistakes or perform certain tasks more safely than the average human.

Robots are also available to perform tasks that humans are less interested in doing. Like most industries, golf course maintenance operations are struggling to find workers. Many other industries have used automation to offset issues around labor scarcity or rising labor costs, and golf is likely to head in the same direction. Conversations during USGA Course Consulting Service visits increasingly focus on labor challenges and how to meet expectations with less staff. Automated mowers may end up providing part of the answer.

While automation and "smart" machines have been used in large-scale agriculture for many years, can those same technologies be applied to golf courses? Are they viable on the much smaller scale of a typical golf operation? Are autonomous mowers a feasible option to overcome staffing challenges and rising labor costs? This article will look to answer some of these questions by exploring the current state of autonomous mowing on golf courses, the benefits



As long as there have been tractors and cutting units, there's been a need for someone to drive the mower. This could be changing.

and challenges associated with this technology, and the outlook for the future.

Before we start, though, it is important to define what we mean by an autonomous mower. For the purpose of this article, an autonomous mower is a machine that may require a human being for transport and/or setup, but does not require an operator to perform the mowing.

A BRIEF HISTORY

In some form or another, several turf equipment companies have been working on autonomous mower technology for 20+ years. However, not much has moved beyond the prototype phase. A small company, Precise Path, introduced the golf world to the RG3 greens mower back in 2009. Facilities that initially tested the RG3 were impressed but the mower was not made commercially available until 2015. That was also the year that Precise Path was acquired by the parent company of Cub Cadet. Early adoption of the RG3 was not widespread, but Cub Cadet continued to refine the technology and made some nice improvements to the mower. Superintendents' hopes were high in early 2020, when Cub Cadet was on the cusp of commercially releasing the RGX greens mower, an upgrade to the RG3. Those hopes were dashed just weeks after the GCSAA Conference that year when Cub Cadet announced it was suspending the program indefinitely. Meanwhile, John Deere and Toro displayed concept autonomous mowers at the 2020 GCSAA Conference. These were larger, five-reel mowers presumably designed

for fairway mowing. It is also worth noting that a company called Turflynx, based in Portugal, was developing an all-electric, completely autonomous triplex fairway mower that was being tested in Europe in 2019. Turflynx was recently acquired by Toro.

WHERE ARE WE NOW?

Cub Cadet's departure from the autonomous game left a void that still has not been filled. Autonomously mowing greens is not an option currently available to golf course superintendents. Large-area autonomous mowing with reel mowers is being worked on but is still not commercially available.

So, while the traditional golf course maintenance equipment manufacturers continue to quietly work on their autonomous mowing technology platforms, other companies have introduced their own autonomous mower options. Most of these have been geared for the homeowner or commercial landscape market. Companies like Echo, Husqvarna, Worx and Belrobotics all have similarly designed robotic lawn mowers. These are all rotary-style, narrow-cutting-width mowers. They are battery powered and are typically controlled by a smartphone app. A boundary wire has traditionally been the way to keep these mowers in their proper place, but new advances have eliminated the need for a wire. Europe gets the gold star for early adoption of these mowers. In fact, the robotic lawn mower market in Europe is estimated to reach \$1.5 billion by the end of next year. Husqvarna claims that their Automower mows over 2 million lawns around the world.

Another company, Turftroniq in the Netherlands, sells two aftermarket kits that can convert most modern fairway mowers to be partially or fully autonomous. Their AMS kit still requires an operator be on the vehicle at all times, but steering and cutting unit raising/lowering are done autonomously. Their RMS kit makes the mower fully autonomous. An interesting benefit to this technology is that if you ever want to take control and mow, you just



Turftroniq's RMS aftermarket mower kit makes this fairway mower fully autonomous.

jump on the mower and flip a switch. Sadly for U.S. customers, Turftroniq products are currently limited to the European market.

Some golf courses in Europe and Canada have been using autonomous mowers for both roughs and fairways. WINSTONgolf, in Germany, has jumped into this world more than most. Course Manager Jordan Tschimperle uses 24 of the Husqvarna Automowers to mow fairways and rough on 27 of their 45 holes and a Bigmow by Belrobotics to mow their driving range. They also extensively tested the previously mentioned Turflynx all-electric fairway mower back in 2019. Current plans are to purchase a few more Automowers as well as the Belrobotics Ballpicker for their driving range this year. With more robots on their maintenance staff than people, WINSTONgolf is realizing substantial labor and fuel savings.

One of the first questions that comes up when discussing autonomous mowers is how much they cost. This is a great question because other than the small, rotary-style mowers there is nothing commercially available to cite. Small mowers like the Husqvarna Automower will set a course back about \$6,000 per machine. This includes expenses associated with setting them up. Husqvarna is very excited to roll out their newest version of the Automower in 2022. However, this machine, like most others in this market segment, will have a limited presence in the American market in the near term.

In 2019, the Turflynx F315 mower was around 125,000 Euros (\$143,000). With further development and inflation, if that style of mower was released in 2022 it could be priced in the \$200,000 range, maybe more. That sticker price may shock a lot of superintendents. However, the benefits of this technology may prove worthy of the expense for certain areas of the country. Let's look at the general benefits and challenges that come with utilizing autonomous mowers on a golf course so we can better understand the calculus each facility will face as they decide whether to invest in this technology now, or in the future.

BENEFITS

As we move into the benefits and challenges of these machines, it is important to make a distinction. I've referenced two completely different styles of autonomous mowers. The small mowers are rotary-style with a plastic disk that is outfitted with as few as three razor-blade cutting units. They weigh anywhere from 30-150 pounds. I'll refer to these mowers as "rotary." Based on the machine concepts and videos shared to date, Toro and John Deere will eventually be offering autonomous versions of the

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Rise of the Machines

traditional fairway reel mowers. These machines will probably weigh just as much or more than your standard triplex or fairway unit. I'll refer to them as "reel" mowers.

The fundamental rationale for using autonomous mowers is to save on labor and all of the machines described in this article offer that benefit. Rotary mowers can be programmed to run 24 hours a day, seven days a week. Battery type and configuration can vary between models but generally, if the mower is running at peak capacity, it can cut grass for about 16-18 hours each day with multiple charging cycles mixed in between. This is important because the cutting width is only around 10 inches, so it takes time and multiple units to mow large areas. It is reported that one of these mowers can mow close to 1.25 acres each day.

Autonomous rotary mowers require very little supervision. Once installed within their respective boundaries they will only stop working when they return to their charging station or send an alarm to the user interface. The average lifespan of the mower blades is anywhere from three days to two weeks depending on turf conditions. Tschimperle at WINSTONgolf said that it takes two to three hours to replace the blades on all 24 of their machines. He also reported that they have saved over 80% in annual fairway maintenance costs by using the Automowers. Most of these savings are in labor, fuel, parts and service.

Reel mower range and productivity is still unknown. The Turflynx all-electric machine was able to mow for seven hours before needing a charge in 2019. At that time, charging took two hours. Since this was a triplex unit, productivity for a single charge was 12-15 acres depending on terrain. If Toro and John Deere decide to offer this



It will be interesting to see if autonomous putting green mowers make a comeback.

style of mower in an all-electric model, expect similar or better productivity than the original Turflynx machine. If traditional engines or hybrid machines are used, range and productivity will be much greater.

Should the style of autonomous greens mower that Cub Cadet was working on come back, it could still be a nice labor "redistributor." That mower required a chaperone to escort it to each green, unload it and send it on its way. However, while the machine was mowing, the chaperone could be cutting cups, raking bunkers, fixing ball marks or performing any other tasks until the mower was ready to be loaded up and delivered to the next green.

There is another interesting benefit specifically with the small rotary mowers. If they're running all day every day, the turf within their boundaries has always been recently cut. Superintendents that have used autonomous mowers extensively have been surprised by the consistent playing conditions produced with these small rotary machines. The turf health benefits of autonomous mowers are still being studied, but it is reasonable to expect lower disease pressure due to a reduced leaf wetness period and fewer earthworm cast issues.

CHALLENGES

One major hurdle with autonomous mowers will be the sticker shock. With price tags ranging from \$6,000 to over \$200,000 for different mower options, varying levels of productivity, and a range of potential features, it is hard to come up with a widely applicable cost-benefit analysis. If the mower is all-electric, substantial fuel savings will be part of the equation as well as the value of zero emissions. Redirecting labor to other maintenance tasks can mean those one or two open positions may be less urgent to fill than they used to be. Regardless, each facility wanting to incorporate autonomous mowers into their maintenance operation will have to come up with their own cost-benefit analysis, and it could be a moving target depending on market conditions.

Another challenge associated more with the rotarystyle mowers is quality of cut. Even with regular blade changes, the quality of cut on the rotary mowers may not be comparable to a well-adjusted reel mower. Each superintendent will have to determine whether the quality of cut meets the standards at their facility.

Designating where autonomous mowers drive and mow has typically been determined by a boundary wire, which

Continued on page 13

can be a barrier to entry for many courses. Installing a ground wire is a substantial expense and creates challenges when aerating, trenching or repairing irrigation issues. However, a few of the rotary mower companies now offer mowers that utilize real-time kinematic (RTK) base station guidance which eliminates the need for a ground wire to delineate mowing areas. In the absence of a ground wire, RTK is currently the only GPS technology that will provide the level of precision required for accurate mowing and cleanup passes every time. All indications are that commercial golf course mowers are going to come standard with RTK technology in the future, which will be essential for widespread adoption.

Maintenance on these machines will range from very simple to extremely complex. For the rotary mowers, ease of maintenance is a benefit because they require little more than regularly changing blades and the plastic disk that holds them. However, the reel mowers will be much more



Cameras, on-board computers and sensors will be abundant on autonomous reel mowers. How do all these get serviced?

complex. Numerous sensors, onboard computers, Lidar, radar, sonar and cameras will all be part of the autonomous reel mower platform. How these get serviced and repaired is still an unknown. Will there be special training required for a mechanic to work on these machines? Will dealers be the only ones allowed to service these high-tech components?

This discussion naturally leads to the biggest challenge for autonomous mowers – liability concerns. Imagine a scenario where property damage or bodily injury happens when an unmanned mower is involved. Who is responsible for that accident? If there is no operator on the machine, is the company that sold you the technology now at fault? Or is it the course who purchased this technology? Or is it the mechanic who last worked on the safety feature that failed? The automotive industry is trying to wade through these same issues as they work to introduce

autonomous vehicles to the masses. It is reasonable to assume that autonomous golf course machines will fall in step with whatever liability and insurability regulations the automotive industry adopts. Until that time, this is probably the biggest hurdle to overcome for the major turf equipment manufacturers.

LOOKING AHEAD

Technological advances in the autonomous world are rapid. It seems like there are new capabilities every month. New companies continue to jump into the market and drive competition and innovation.

In the rotary market, the United States will see a limited launch of the Husqvarna CEORA Automower in 2022. Anticipate a full launch in 2023. This mower will have a drive unit and a detachable cutting deck. There will be three decks with different height-of-cut capabilities. The fairway cutting deck will reportedly cut as low as 0.25 inch and as high as 1.75 inch. The other decks will have height-of-cut ranges higher than this. Programmable cutting areas will allow the user to have the same machine cut different areas



Small, rotary-style autonomous mowers are likely to become more of a presence on U.S. golf courses in the near future.

at different heights of cut without human intervention. No ground wire will be necessary for these RTK-guided units. Productivity will be around 5-6 acres per day if the machine is running 24/7. Typical charging time is around four hours for eight hours of mowing. Batteries are expected to last five to seven years. The price point on this type of machine will be in the \$30,000 range.

This style of autonomous mower will likely not be the only one to hit the U.S. market in the next few years.

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Rise of the Machines

Companies like Echo and Stihl already have a presence in the autonomous home lawn mower market but will look to expand into commercial and possibly golf applications in the near future.

For reel mowers, the future is a bit more uncertain. Major golf equipment manufacturers like Toro and John Deere have been working on autonomous mower concepts and prototypes for many years now. Both companies displayed their latest concepts at the recent GCSAA Conference in San Diego. The Toro version was a hybrid triplex while the John Deere unit was a conventional diesel-powered, five-reel fairway mower. Both units were loaded with sensors, cameras and onboard computers. Both also had a seat and steering wheel, which is significant because it will allow the mowers to be controlled by humans when necessary. Company representatives were cautiously optimistic and the plan is to extensively test them in the field this year. No timetable was given for a potential commercial launch from either company.

As previously mentioned, Turftroniq has an aftermarket kit that can make a normal fairway mower partially or fully autonomous. As their distributor network and support expands to the United States, this could be a viable option sooner rather than later.

"With all these autonomous mowing options swirling about, and the ongoing labor challenges affecting golf courses everywhere, the mass adoption and acceptance of this technology seems inevitable."

With all these autonomous mowing options swirling about, and the ongoing labor challenges affecting golf courses everywhere, the mass adoption and acceptance of this technology seems inevitable. As regulatory bodies finalize safety, liability and insurability issues with an autonomous platform, you're likely to see a groundswell of new machines hitting the U.S. commercial, sports field and golf markets.

FINAL THOUGHTS

As we consider what a golf course maintenance operation could look like with autonomous mowers continuously mowing large portions of the course, a thought comes to mind. What happens to those employees whose main role has been to sit on a machine and mow for hours every day? Will they want to do a different job on the course? Will they be able to do a different job on the course? Will this reduce the number of workers on golf courses, or will autonomous mowers simply help to fill positions that are already open? In a labor-challenged market, it is hard to think there could be many drawbacks to the concept of robots mowing grass for us. However, if recent conversations on this topic are a harbinger of things to come, there will be no shortage of strong opinions on the impending rise of the machines.

Cory Isom is an agronomist in the West Region who still enjoys sitting on a mower.

ACKNOWLEDGEMENTS

Special thanks to Jordan Tschimperle for his contributions to this article.

ADDITIONAL INFORMATION

Learn more about how autonomous mowers are performing on golf courses in our conversation with Bjarni Hannesson, course manager at Ness Golf Club in Iceland, and Erwan Le Cocq, head greenkeeper and robot technology specialist from WINSTONgolf in Germany.



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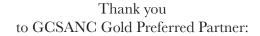
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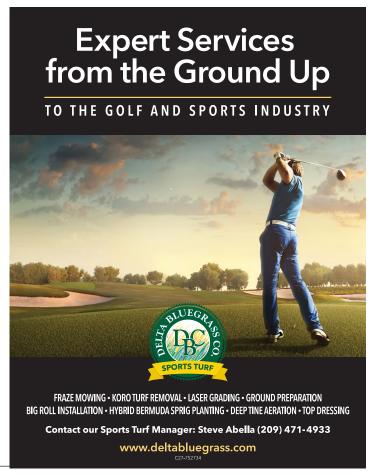
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The Covid Effect: Five Ways COVID-19 Has Impacted Golf Course Maintenance

By PAUL JACOBS, Agronomist, Central Region

It seems like not too long ago we were all in the middle of a 14-day mandatory quarantine to slow the spread. Almost two years later, the virus is as persistent as ever and its impact has gone well beyond toilet paper shortages. The impact of the virus has extended deep into the golf course maintenance industry and just how severe and permanent some of the effects will be is still to be determined. However, there are some specific challenges brought on by the pandemic that both golfers and key stakeholders should be aware of, especially when making budgetary decisions and setting expectations for daily conditioning. Here are five of the biggest challenges that the pandemic has created for golf course maintenance:

- Labor has unequivocally become one of the most frustrating topics for superintendents. The issues seem endless wages are up, the labor pool is smaller than ever, COVID-19 issues and precautions have staff in and out of work, and reliability in general is a challenge. Needless to say, it is difficult to organize daily maintenance operations when the number of employees showing up varies significantly from day to day. The long-term impact is that total staffing numbers are down for many operations. This influences how much work is accomplished each day and season.
- One of the positive changes for golf through the pandemic has been a surge in rounds played. This is great for the game but can be a maintenance challenge due to the added traffic, ball marks and divots on tees. For the most part, these issues can be managed if budgets are adjusted to reflect the need for increased inputs. In some cases, permanent changes like tee enlargement, cart path installation or selective tree removal will be necessary to help turf withstand the increased traffic.
- Common materials such as topdressing sand, fertilizer and maintenance equipment are much more expensive than they were a few years ago. If budgets have not been adjusted to compensate, course conditions are sure to reflect the reduction in inputs eventually. In some cases, the cost to ship some of these materials can be more than the cost of the material itself! As you might imagine, the labor challenges extend well beyond the turf industry and



are affecting prices for shipping and general material availability.

- Some construction materials and golf course maintenance equipment have been very scarce due to high demand and supply chain issues. Some courses have delayed projects because they cannot acquire necessary materials. Not only is it hard to find maintenance equipment, the availability of golf carts and golf equipment has been limited in many markets as well.
- As discussed earlier, total rounds are up at most facilities. This is a good thing, but it's important to recognize that one component of the surge in rounds has come from an increase in new golfers. These players are not as familiar with golf etiquette, especially as it relates to course care. For this reason, golfer education might be a more important aspect of a superintendent's job than ever before. If more golfers are fixing ball marks, filling divots, obeying cart rules and raking bunkers correctly, playing conditions will be better and the maintenance team will be able to focus more of their time on other tasks.

The increase in play due to the pandemic is something all who play the game or work in the golf industry should embrace. It is a promising sign for the future of golf. However, as play has increased operational challenges associated to cost of goods, labor and limited availability of equipment are making it increasingly challenging to provide conditions that many have come to expect. USGA agronomists are here to help with solutions to manage increased traffic and improve course conditioning. If you would like to discuss any of these issues further, feel free to contact your regional agronomist.



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