

appear over time, like inadequate pressure or loosening packing in your pump station.

DATA HOARDING AND DOCUMENTATION

An irrigation audit can be simple or exhausting. You can evaluate individual zones for distribution uniformity, assess specific areas in your facility for trouble spots or appraise the entire system top to bottom.

Irrigation consultant Brian Vinchesi advises identifying a specific goal or goals before commencing an irrigation audit. "It's good to know what you're hoping to accomplish with your system before you get started," he says. "Are you considering adding a new water source? Are you facing new watering restrictions on how much water you can use or the hours you can use it? Are you adding zones or fields? Are you looking for significant water savings?"

"There are numerous considerations," adds Vinchesi, president of Irrigation Consulting, Inc., in Pepperell, MA. "Sites change over time. More entities tap into your water source, which can affect available pressure and water quality. Fields might be added or eliminated. Safety concerns in sports turf facilities have changed over time. It's all part of the mix and should be evaluated and documented."

You have to be in the field to know your how well your program is performing. However, desk duties are part of the game. In the office, gather previous years' water reports, architectural blueprints, irrigation design plans, as-built drawings, water scheduling programs, water quality reports and other useful data used to manage water and other resources. And, before you step onto the field, Vinchesi strongly recommends adding a camera to your toolbox.

With your history and documentation secured, it's time to get outside, look things over and take down some notes and numbers. "Beyond equipment issues, which must be recorded, your best opportunities to improve water use are with management, like irrigation scheduling and uniformity," points out American Society of Irrigation Consultants President Ivy Munion, with

Simple sprinkler audit inspection checklist

- Check the coverage of full- and part-circle heads, ensuring that the sprinkler is adjusted to cover only the portion of the facility it is intended to.
- Check the radius of throw and ensure that the head is rotating completely. Check disbursement at each nozzle, ensuring that the orifice is not clogged, obstructed or excessively worn. Replace nozzles that appear worn, as they may alter flow rates, precipitation rates and coverage.
- Use a pitot tube to check nozzle-discharge pressure. Log all data for future reference. If several heads in a zone become weak or inoperative, there may be debris in the valve or a breach in the piping.
- Inspect the sprinkler housing for damage or debris.
- Check your low sprinkler heads for drainage.

ISC Group, Inc., in Livermore, CA. Look at your facility as a whole. Document turf wear, hot spots, soupy areas, compaction, drainage and the like.

Ideally, your system is performing at the designed volume, flow and pressure. Your original irrigation plans will provide those numbers. Take a pressure reading at the

water source. Inspect your cross-connections, master valve(s), flow sensors, pump station(s) and smart technology, looking and listening for smooth, proper cycling and operation. Check your metering devices, looking for the spinning leak dial. "In a multiple field complex, you need to really observe how everything interacts," Vinchesi



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◀ **Bob Campbell, CSFM**, and former president of the STMA, works with an attendee during the hands-on irrigation workshop on a Cincinnati Bengals practice field.

catch-can tests,” she says. “Field changes over the years are horrible. We see more duct tape, pipe glue and bailing wire than we care to. Those things should absolutely be resolved in this process.”

Once the basics are in line, develop a punch list of items to inspect. Go to your valve boxes and ensure they’re off the field, accessible, buried to grade and well-drained. Clean them out and check the wiring to ensure connections are solid and dry. Look for leaking or weeping valves. Keep a log of everything you observe, good or bad.

GET INSIDE YOUR HEADS

The root byproduct of poor irrigation uniformity is overwatering. Runtimes are developed based on the weakest coverage area. We irrigate for the dry spot, regardless of what pours over the remaining landscape area. “Really consider how your system is zoned,” Vinchesi says. “Older systems might have been designed for sprinklers to just run across the field, but by zoning goal areas or infields you have greater control over turf wear and resilience without just pouring more water over the site. Fundamentally, irrigation is about control.”

The goal of a simple audit is to improve sprinkler distribution uniformity and zero in on accurate scheduling. It’s time to operate the system; checking each valve and head in each zone. Ensure that heads and nozzles match, and that each head is perpendicular to - and

asserts. “Record your start times and run times zone by zone, and how they all fit into your scheduling window. You might discover your system can’t handle your scheduling demands.”

Grab your foreman and inspect your control system and satellites; ensure connections are tight and your scheduling is on track and adjusted for the season. Record the number of field controllers, active zones on each controller, programmed runtimes for each zone, number of heads on each zone. Keep those records handy for your sprinkler inspections, where you can record head make and model, nozzle size, radius and distance of throw, and pressure at the head (using a pitot tube).

While Vinchesi likes to start an audit as is, without first tweaking the system, Munion wants the simple stuff rectified. “Broken or misaligned heads, rotors mixed with spray heads on the same zone, worn or clogged nozzles [are examples of] fundamental equipment transgressions [that] should be resolved before we start running

to grade with - the surface. These are important performance and safety issues. Check nozzles for obstructions or wear, and replace with the specified nozzle size. Replace heads that don’t match design or operating specifications.

Check the pressure and rate of water discharged from your heads. Ensure that the operating pressure at the head is consistent with the manufacturer’s specifications. Too much pressure creates poor uniformity, wind drift and accelerated evaporation. Too little pressure affects radial sprinkler uniformity. While your there, measure the distance between heads. Your system should provide head-to-head coverage.

CAPTURING PRECIP RATES AND DU

Catch-can tests quickly reveal distribution uniformity (DU), or how evenly water is being applied to your fields, while measuring your precipitation rate in inches per hour. Locate your trouble spots, like infields, goal areas and/or the center of the field, and stake out

your catch cans in a uniform grid in multiples of four (28 catch cans, 40 catch cans, etc.) within that area.

By necessity, irrigators water to the driest areas, so you're assessing your lower-quarter distribution uniformity, or the poorest performing 25 percent of sprinkler coverage for the affected area. Run every zone that covers the affected area for 15, 20 or 30 minutes – enough time to register measurable amounts in the catch-cans that are convertible to inches or milliliters per hour. This reveals your problem heads/zones and your per-hour precipitation rate – data necessary for comparing what your site gets to what it needs (based on turf type, soil profile, drainage, evapotranspiration rates, sustained winds, sun exposure, etc.).

Whether you've conducted an all-inclusive, system-wide audit, or catch-can tested select areas within the park, you've gathered important data, and now it's time to put it to work. Provided your water volume, flow and pressure(s) are still at design levels, triage your repairs, plan any sprinkler head relocations, build you inventory and adjust scheduling accordingly. Get your crews out and start effecting the simple improvements, focusing on safety and equipment integrity, while planning larger projects that require significant budgets and disruption, like pump station issues or pipe sizing challenges.

Organize a regular irrigation system inspection program.

Determine which parts to keep in stock for quick repairs, including all sizes of pipe and fittings; electric valves; wire and connectors; swing joints and risers; and sprinkler heads and nozzles. Ensure that the spare parts are of the same make and model as those in the field. Product integrity plays a big role in efficiency.

Most field managers have inherited their systems with all their scabs and warts. Performing a system audit can put you in a position to truly improve your playing surface through a surgical approach, rather than constantly putting bandages on a tumor.

Vinchesi suggests enrolling in Irrigation Association certified landscape or golf irrigation auditor programs. "These courses, scheduled throughout the year across the country, are worth your time," he says. "They provide important standardized tools and procedures, and sources for valuable localized data needed to generate accurate irrigation schedules."

A proper irrigation audit documents core system problems and provides effective, triaged solutions as a blueprint for progress – with associated payback. Put your problems and solutions on the table and watch others wipe their sweaty palms and suppress their nervous ticks. ■

Luke Frank is a veteran green industry writer with extensive experience with irrigation topics.

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FIELD CONTRACTOR "BUILDS" THEIR COMMUNITY



▲ **Ted Mercer**, left, and his son, **Troy**, built and maintain a public ballfield in their hometown of Troy, OH with their own time and money.

Former Mercer Group, Inc., a regional athletic field contractor based in Troy, OH specializes in athletic field construction, renovation and maintenance of all types of athletic fields. Their clients consist of college, high school and parks and recreation sports fields.

Ted Mercer, owner of Mercer Group and a native of Troy, used to frequently drive by a park owned by the City of Troy located close to his office and warehouse. This site was the town dump in the 1950's and 1960's. Mercer couldn't help notice the dilapidated baseball backstop and the dirt field grown over with weeds. One day Mercer knew something had to be done.

So Mercer and his son, Troy, and a staff consisting of four went into action. Mercer approached Troy city officials in the fall of 2012 and asked permission to construct a youth baseball field. In return for Mercer Group installing and maintaining the field, the City of Troy would allow the field to be called "Mercer Group Field." The city park

board agreed, and thus the construction of the new field. All Mercer asked for was that the field be open to anyone who would want to use it.

"We wanted to give back and the city was tremendous in allowing us to do this," Mercer says.

Mercer's labor of love certainly didn't come easy. The journey toward a new field began in March 2013 with the leveling of the playing field. Parts of the field had to be raised more than 3 feet to provide a flat playing surface, which meant Mercer Group had to bring in more than 7,000 tons of dirt. One month later the dirt was graded and laser leveled to prepare for the topsoil over-layer. About 880 tons of topsoil was brought in. In late-summer 2012, the outfield was graded and seeded and the foul poles were installed. Over the winter, the outfield fence and backstop were installed. The outfield fence measures a uniform 225 feet from home plate, the exact same dimensions used at the Little League World Series' Lamade Stadium in Williamsport, PA.

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Around the same time Mercer Group Field was taking shape earlier this spring, the Cincinnati Reds were getting a new profile installed in their infield at the Great American Ballpark. Mercer, who knows Red's groundskeeper Doug Gallant and his assistant, Chad Lavender, asked if they could have a few truckloads of the Reds' old topdressing. Two loads of the infield mix were brought straight from Great American Ballpark to put atop Mercer Group Field.

Once completed Mercer Group has continued to do the maintenance of the field including, but not limited to, mowing, infield screening and lining, fertilization of turf, as well as general ball field maintenance. Mercer Group donated all the construction and the maintenance costs of the field. All improvements were paid for by the Mercer Group and donated to the City of Troy.

The ball field is designed for 12U and under baseball and all ages of women's softball. The field is used by the general public. Mercer Group has plans each year to make improvements to the field. It is truly a public/private partnership with Mercer Group and the government entity of the City of Troy Park Board.

"As city budgets get tighter and tighter, we believe you will see more projects like this in cities across the country," Mercer says. "It is truly heart-warming to see a park area once used very little, to now see kids, both boys and girls, playing baseball and softball. I could not be prouder of our company for giving back to our community." ■



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325 YEARS LATER, Husqvarna in Tune with the Marketplace

Husqvarna shares its birth year with... Johann Sebastian Bach. One of the world's greatest composers remains a powerful force in classical music because of the quality of his work — which consists of over 1,000 elegant pieces of music — from concertos and cantatas to sonatas and orchestral suites.

Like the Baroque works of the adored German musician, appreciated as much for his technical command as his artistry, Husqvarna too has endured for 325 years. But while Bach's compositions — of course — have not changed in that time, Husqvarna's output has evolved dramatically over 3-1/4 centuries.

Today, Husqvarna is the world's largest producer of outdoor power equipment. When our company started, on the banks of the Swedish river that gave us our name, "power equipment" did not exist. The company was founded to manufacture much-needed musket barrels

for the army of King Charles XI as they prepared to ward off a threat from Denmark.

In the years and decades and centuries that followed, Husqvarna has evolved both subtly and dramatically, keenly in tune with consumer demands, competitive opportunities and economic realities. Reading the list of products that the company has manufactured and marketed could take nearly as long as Bach's *Mass in B minor*.

Swords. Sewing machines. Wood-burning stoves. Motorcycles. Household products — from spittoons to cherry stone removers and herring fryers. At one time, the company had such a strong presence within the household that famed artist Ewert Karlsson said that "Husqvarna" was the first word he learned — since it was stamped onto the iron stove in his mother's kitchen, on the frame of his first bicycle, and on the housing of the family sewing machine.

A history of Husqvarna mirrors the history of Europe and, ultimately, the world. As technology has evolved,

Timeline

1689: Rifle factory

When Swedish weapons production took off in the late 17th century, hydropower was needed to handle certain mechanical operations. The drillingwork at the waterfalls in Huskvarna, southern Sweden, was our first plant.

1872: Breaking new ground

A very innovative and ambitious period, resulting in a broad array of new products: sewing machines (1872), hunting weapons (1877), wood stoves (1884), mincing machines (1890), and the first Swedish typewriter (1895).

1896: Bicycles

The era of bicycles begins — and lasts through 1962.

1903: The motorcycle era begins

Husqvarna earns a worldwide reputation, as its lightweight-yet-powerful engines helped make some of the most successful track racing and motocross bikes in history.

1919: The first lawn mower

Husqvarna acquires Norrahammars Bruk, the first step in the Group's current focus on outdoor power products. The first motorized Husqvarna lawn mower for commercial use is launched in 1947, and in 1959 the first homeowner model reaches the market.

1959: The first chain saw

Expertise in engines from the production of motorcycles is now utilized in new

product areas, as Husqvarna introduces its first chain saw — which used motorcycle muffler technology to achieve lower noise levels than its competitors.

1969: Setting new standards for ergonomics

When the Husqvarna 180 chain saw is released, it features a groundbreaking anti-vibration function that prevents "white fingers disease," a common problem for forestry workers around the world.

In 1973, Husqvarna introduces the world's first chain saw with an automatic chain brake. In 1999, the feature TrioBrake is introduced, enabling users to activate the chain break with the right hand — further reducing the risk of injury for forestry workers.

► **Top right:** During the past 325 years, in addition to outdoor power equipment, Husqvarna has manufactured muskets, swords, sewing machines, wood-burning stoves, motorcycles, household products, and much more.

Bottom right: Husqvarna began on the banks of the Swedish river that gave the company its name.



Husqvarna has been there, priding ourselves in our inventiveness, innovative capacity and technical proficiency. Glancing through a book about Husqvarna produced in 1989 to commemorate our 300th anniversary yields fascinating facts and photos, like those of Husqvarna motorcycles shown racing to victory on the world's fastest courses.

Like those long-ago motorbikes, today's Husqvarna products rest comfortably — when not in use — in garages and backyard storage sheds throughout the U.S. and the world. While the engineers and machinists who earned widespread acclaim on earlier products are long gone, they established a legacy that today's workforce holds dear — a commitment to high quality, proficiency, value and safety that has earned Husqvarna strong sales and a well earned reputation for leadership.



1978-1979: Outdoor power products expand

The outdoor operation continues to expand both through organic growth and through acquisitions. Power products now include chain saws, motorcycles, lawn mowers and power-cutting machines.

1980s: Strengthened positions in the U.S.

Organic growth and acquisitions expand Husqvarna's operations in lawn and garden. Two major acquisitions, Poulan/Weed Eater and Roper Corp, complement Husqvarna's product range, making the U.S. the largest market for garden equipment.

1995: The birth of the robotic mower

Husqvarna pioneered the market by

launching the world's first solar-powered fully robotic lawn mower. In 2013, a third-generation model with built-in GPS is introduced.

2002: Power cutters and diamond tools

When Diamant Boart International was acquired in 2002, the construction business doubled in size, turning into a world leader within its segment.

2007-2008: Expansion

Husqvarna expands in watering by acquiring the Gardena brand, followed by Zenoah (which enables expansion in Japan). Production in China is expanded through the acquisition of Jenn Feng and the construction of a new plant for

chain saws and other handheld products.

2009: Husqvarna demolition robot

Husqvarna's first remote-controlled demolition robot is launched, designed for all demolition tasks and for where it is too dangerous for workers to enter.

2012: Battery products

Husqvarna introduces a range of battery products for consumers and professionals.

Sidebar provided by Husqvarna.



Husqvarna's logo has evolved throughout the years, yet still harkens back to the motif of the company's original logo (left). All photos and graphics provided by Husqvarna.

Our mission statement as a 21st century company is quite specific: We provide innovative quality products and solutions to make garden, park and forest care, as well as construction easier for professionals and consumers around the world.

But I feel certain that elements of that mission — especially the references to innovation, quality and a commitment to making life easier for customers — have been important to the hundreds of thousands of Husqvarna employees who came before us.

Today's Husqvarna zero-turn mowers, professional chain saws, drill systems and dozens of other product lines may not bear a literal resemblance to the muskets and kitchen equipment of our past. But the precision of our products and the passion of our 14,000-plus employees in over 40 countries have remained consistent all these years. Perhaps what has been passed down is the "Gnosjo spirit," which our early workers were said to have — a blending of industriousness, inventiveness and resolve.

Often, as the head of Husqvarna's North American operations, I am asked what has made our company so successful in the highly competitive outdoor power equipment marketplace. That is a simple question, and — despite the complexities of the modern marketplace — demands a simple answer.

Perhaps I should borrow a line from one of my Husqvarna for-bearers, who wrote the following 25 years ago: "Thanks to our very capable, well trained personnel, our good products and our excellent reputation, we are well equipped to meet new challenges."

So true, 325 years into our history. ■

Alan Shaw is Head of Americas for Husqvarna, Charlotte, N.C.



◀ Husqvarna has prospered, evolved, and grown due to its commitment to engineering excellence, a strong entrepreneurial spirit and a passion for developing innovative, high-quality solutions.

Husqvarna: Looking Ahead

What does the future hold for Husqvarna?

A clue can be found from our 325-year past. Husqvarna has prospered, evolved, and grown due to our commitment to engineering excellence, a strong entrepreneurial spirit and a passion for developing innovative, high-quality solutions.

That begins with staying close to customers, whose input, insights and changing needs have fed our steady stream of new products and enhancements that not only promote ease of use but also showcase our focus on sustainability.

In 2014, we have unveiled a number of groundbreaking solutions that address our customers' demands for high-quality solutions. A few of the latest Husqvarna technological breakthroughs include:

- AutoTune, a technological and environmental advancement in professional chain saws that minimizes exhaust emissions and optimizes engine performance; it eliminates the need for carburetor adjustments.

- X-Torq, a technology that delivers lower fuel consumption and reduced exhaust emission levels in accordance with the most stringent environmental regulations; it is used predominantly in handheld products.

- Additions to our growing line of battery-powered products; these lightweight products are quiet and free from direct emissions.

- Continued enhancements to our line of self-operating robotic mowers, which save time and effort for homeowners and facility managers; they produce no direct emissions during use and consume very little energy.

- Additions to our line of industry-leading all-wheel-drive mowers, designed for uneven terrain and tough mowing conditions.

Looking ahead, Husqvarna will focus on continuing to grow our independent dealer sales and retail channel, while also focusing on high-growth geographic markets, especially in Latin America.

And with housing starts and existing-home sales on the rise once again, Husqvarna will continue to leverage our leadership position as the world's largest provider of outdoor power equipment.

Here's to the next 325 years!

Sidebar provided by Husqvarna.

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CHAMPIONSHIP FIELD, Seattle University

■ **Category of Submission:** College Soccer
■ **Sports Turf Manager:** Kevin White
■ **Title:** Athletic Fields Supervisor
■ **Education:** Associate's degree in turf and landscaping
■ **Experience:** Bachelor of Science, Ornamental Horticulture/Turfgrass management
Experience: I have been working on the athletic fields at Seattle University for 4 years. Prior to Seattle University, I worked 8 years in golf course maintenance, 4 as an as-

sistant superintendent. While attending Cal Poly Pomona, our Turf Club would renovate a sports field each year.

■ **Full-time staff:** Peter Larson
■ **Part-time staff:** Emily Perales
■ **Original construction:** 2005
■ **Rootzone:** 100% sand
■ **Turfgrass variety:** Kentucky bluegrass/perennial ryegrass. We custom blend our varieties to ensure we get the desired traits for high wear and quick germination.

■ **Overseed:** : During heavy use periods, August to October, we seed weekly at 5lbs/1000. Our coaching staff does a good job using the entire field, so we treat it all the same. However, we do seed heavier in the goalmouths, sidelines and team bench areas.

■ **Drainage:** Gridiron system consisting of 4" double-wall ADS laterals spaced 10' o.c. draining into an 8" collection header that feeds into a retention vault under the field.

