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"Readying Your System for Winter"

By Luke Frank
Reprinted from the October 1999 issue of Landscape & Irrigation

The days are getting shorter and the nights cooler. Leaves are flaming their oranges, reds and yellows, and landscapes are preparing for hibernation. As Old Man winter approaches, so should your winterization plans.

Winterization is a fact of life in some areas more than others, and, although it's not overly complicated proper winterization needs to be performed to avoid pipe and system damage that may surface next spring or later.

Water in your system can be your worst enemy in the winter. Some contractors believe poly pipe offers sufficient flexibility to absorb the expanding and contracting forces of water in the winter. However, most experts agree that all piping needs to be thoroughly blown out. Even if the poly pipe holds through the next irrigation season, the freezing and thawing of water left in the system over the winter can stress the piping and easily result in failure down the road.

A combination of strategically placed drains in the system's low spots and a good, properly selected air compressor will make relatively quick work of residential or commercial system winterization. However, speed is not the issue here—thoroughness is.

Opinions vary on just how much pressure and volume of air are required to properly blow out a system. But high pressures (60 psi and greater) should be avoided. Air volume—not pressure—is the critical component to evacuating a piping system of water.

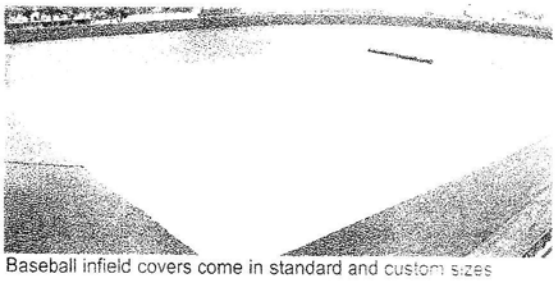
Air volume and pressure should be based on the specific irrigation system pipe pressure ratings.

SHUT'ER DOWN

What is obvious to some may be obscure to others. Begin your winterization by shutting off the water to the irrigation system at the isolation valve. The main shut-off valve to separate the irrigation system from the home's potable water system should either be insulated in a valve box or located inside the home. If there's no isolation valve to separate the irrigation system from the home's potable system, install one. You'll need it to winterize and can really save the property owner an inconvenience if there are future irrigation system problems that require long term care.

Drain valves must be installed at the proper location in the piping system to enlist gravity's assistance. Your system should

Continued on page 4.....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Continued from page 2..."Readying Your System for Winter"

have a drain in every low spot on each lateral in the site. Most contractors will install piping at a grade to assist with the drainage.

When installing drains, dig out an 18-inch deep posthole and fill it with gravel so that the water has a place to go. Install them where you need them. It won't take long, and they help to completely winterize the system. Remember that any drains you open in your winterizing need to be closed so that no water can re-enter the system during the winter months.

Air relief at the high points on each zone (most of the time a sprinkler will do) allows the water to flow from the drains. You can remove a sprinkler head at the end of each lateral to accentuate air relief. Never stand over a sprinkler head or work on any other system components while you're performing a blow-out.

THE EVACUATOR

Akin to time, compressed air is the other water evacuator. If you haven't used it, find a coach. Don't perform your first blow-out solo.

A significant element of successful winterization is the size of your compressor. For the average residential system, a 50-cubic-feet-per-minute (CFM) compressor is adequate. A 125-CFM compressor will handle a larger commercial system with 2-inch main. Make sure that your compressor has an accurate pressure regulator valve and gauge.

Your isolation valve is closed, your drains are in and your air relief is open. It's almost time to introduce compressed air.

Have an organized plan for your blow-out before you begin. Determine which isolation valves you want opened and closed at what point in your winterization process, so that you're not just pushing water around in the pipes.

The air compressor line should be connected to the piping system prior to the back-flow preventer through a minimum 1-inch inlet with a valve shutoff on the main. Don't use back-flow preventer test ports as blow-out points, nor should service valves be used as shut-off valves—they should remain open. Ball valves on your back-flow preventer should be left in a 45-degree position for the blow-out and for the season. Don't leave valves fully open or closed. Consult the back-flow preventer manufacturer before you commence your blow-out.

Blow out the zones furthest from the connection point first, which will evacuate water from the main line initially, enabling the operator to winterize the remaining zones faster. Piping at higher elevations on the site should be purged early in the procedure to prevent water from running back into already winterized areas. Remember to gradually fill the system with air. Don't try to blast a bunch of air into the system all at once, and make sure that nobody is standing over a sprinkler head when you begin the blow-out.

Avoid running air through the system when no water is present; it could damage piping or system components. Sprinklers should be operated no more than one minute when no water is present. Open all manual zones and quick-coupling valves during the winterizing procedure to evacuate the water.

If it's taking longer than three minutes to completely blow out a single lateral, turn the compressor off and let everything cool down. Then proceed. Some superintendents have found that using a turbine-type air compressor won't heat the piping up so quickly. If you can't get the air out of the system with a gradual increase of compressed air, then you need to look at a larger compressor.

Open the valve farthest from the point of connection. Don't open more than one valve at a time. Turn on the air compressor and slowly introduce the pressurized air. Watch that the pressure doesn't exceed 50 psi. The lower you can keep the pressure and completely evacuate the system, the better for the components.

Operate each zone until the water exiting each nozzle is a fine vapor mist. Winterize each zone at least twice. Use several short cycles of air for each lateral line, so any water that drains back into the pipe will be evacuated with the next blow-out cycle and the piping system won't heat up. Operating each valve multiple times will also exercise the valves' and back-flow preventer's operating parts, thus vacating them of water. Several short cycles are better than one long cycle. Take your time. A good blow-out of a larger residential or commercial system can take a day or more.

Any low-lying sprinkler heads also need to be drained, especially those with check valves. Pull 'em and drain 'em. If your system is composed of open-orifice sprinkler heads (pop-ups), it may benefit you to install check valves to prevent any water from re-entering the piping network through these heads.

THE SHUT-DOWN

After the system is free of water, slowly shut down the flow control on the compressor until it is no longer introducing air. Then shut down and disconnect the compressor. (Never disconnect the compressor when the system is still under pressure.) Make sure that all parts to the system are dry and replaced before winter settles in.

A good winterization ensures a good recharge in the spring. It's worth reminding you to flush your system in the spring, particularly drip zones, to eliminate any debris or critters that may have settled in for the winter.

After your piping system is empty, go into the garage and shut down the controller. If you want to save the programs, leave the power on and use the rain override feature for the upcoming winter season. By interrupting the signals to the valves, your run-times and days are saved, and you won't have to re-program the controller next spring.

If there's no rain override, unplug the controller. If a pump station is connected to the control system, unplug the timer. Speaking of rain, if you have a rain catchment device, turn it upside down for the winter.

Winterizing your system slowly and deliberately goes a long way in preserving the piping and components for seasons to come. Show a little respect for Old Man Winter in the fall, and he's less apt to demand your respect in the spring. ▲

Did You Know? The most effective control against the establishment of weeds in turfgrass is the culture and maintenance of a dense, healthy stand of turf.

"Protecting Turf from Winter Injury"

by John M. Roberts

The short days and cool temperatures of fall signal the start of winter dormancy for turfgrasses. Considering the heavy play most sports fields receive in early spring, it's critical that turf survives the winter. Damaged fields rarely have enough time fully to recover before the words "play ball" will be heard.

"Winter kill" is a generic term used to describe any loss or injury of turf during wintertime. From a prevention standpoint, it's helpful to break down the major causes of winter injury into more specific categories, which include the following: direct low temperature, traffic, winter desiccation, crown hydration damage (alternating freezing and thawing temperatures in wet soils), and low-temperature diseases. Ice covers are generally considered to be "indirectly" responsible for turf injury by forming a gas impermeable lens that creates and unhealthy environment for the turf below.

In a nutshell, the following preventive measures will help turf survive the winter.

High Fall Potassium Levels

Research continues to demonstrate potassium's benefit to turfgrass by improving its tolerance to various environmental and biological stresses, including drought, wear, heat and winter damage.

Potassium is highly water-soluble and easily leaches from plant tissues and sandy soils having a low cation exchange capacity. As a result, unexpected potassium deficiencies can occur. The use of slow-release potassium sources or more frequent, light applications throughout the year helps prevent this loss.

While potassium levels should remain high throughout the growing season, late fall is an especially important period for winter survival. In effect, potassium acts like antifreeze within a turf, enhancing its winter hardiness. Applying low nitrogen, high potassium fertilizers (1:2 to 1:5 ratios) in late fall continues to be popular among grounds managers to provide fields with potassium for the winter.

Low Nitrogen during Hardening

Approximately 30 to 40 days before winter dormancy, known as the winter hardening period, nitrogen (especially fast-release sources) should be used sparingly. Other practices that encourage active growth during this period are also discouraged. Unlike potassium, nitrogen during the hardening period increases tissue hydration levels and stimulates new growth, producing tissues that have thin cell walls. The net result of this over stimulated growth is turf more susceptible to freezing stress and winter diseases.

Drainage, Drainage and More Drainage

One of the key principles in reducing winter damage on sports fields is to provide rapid soil drainage. Poorly drained fields are highly vulnerable to an array of winter injuries. Unless the drainage is improved, it's usually just a question of time before large sections of turf are lost.

Both the subsoil and the surface need to drain freely. Installing drain lines, constructing fields with coarsely textured soils, and aerifying to relieve compaction help improve the water infiltration and percolation rates. To reduce standing water and accelerated surface runoff, fields in the northern states are often crowned (14 to 18 inches) to compensate for the impervious nature of frozen soils (even sandy textures).

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Avoid Over Watering in Late Fall

Late fall irrigations should be either avoided (preferably) or, if necessary to prevent drought stress, lightly applied. A grass plant prepares for winter by under going a number of physiological changes, including a dehydration of its tissues. This "drying out" condition in late fall is necessary for turf stands to achieve their maximum levels of winter hardiness. Otherwise, wet or saturated tissues are especially susceptible to direct low temperature kill, winter diseases and crown hydration injury.

Increase Mowing Heights

If feasible, skip the last mowing or raise the mowing height by ½ inch in mid fall. This allows turf to increase its carbohydrate reserves, which are vital for winter survival. Investigators have shown turfgrasses to be particularly vulnerable to winter injury during the late winter and early spring when carbohydrate levels are at their lowest. Warning! Turfgrasses are generally more susceptible to snow molds at higher mowing heights.

Continued on next page .....

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Continued from page 5 "protecting Turf from Winter Injury"

Remove Excess Thatch

Thick thatch layers tend to dry out quickly and serve as a harboring place for snow mold fungi. Winter disease and desiccation damage will be reduced if coring or thatch removal is practiced during the year. Late fall aerification may lead to desiccation around the coring holds during winters when there is not snow cover.

Traffic Control

The brittle tissues of frozen turf during the winter are prone to injury by traffic. The most severe damage seems to occur when bare or slush-covered ground exists. Snow (especially dry snow) acts like an insulator, protecting the turf below from traffic and direct low temperature injury.

Disease Prevention

Two of the most common and destructive low-temperature fungi are the two snow molds, pink and gray. Like Typhula blight (gray), pink snow mold can occur under snow, or is often observed in the absence of snow cover during cool (less than 50 degrees F), wet weather in fall, winter of spring. Gray snow mold is common in northern regions that receive more than 90 days of snow cover. It is particularly severe when snow covers partially or completely unfrozen ground.

A combination of fungicides and cultural practices is needed to provide acceptable levels of control in locations where disease pressure is high. Cultural practices that improve drainage, reduce thatch and maintain a balance fertility program (moderate nitrogen levels) help reduce both diseases. In general, contact-type fungicides are used for the prevention of gray snow mold and should be applied within a few days of snowfall.

Protective Blankets, Topdressing or Straw

Protection from low temperature injury, earlier spring green-up, and reduced desiccation are just a few of the benefits synthetic covers, topdressing, straw or the selective placement of snow fences can provide. Geotextile covers are also used to protect young seedlings and speed up germination or regrowth between hash marks and around the goal mouths of soccer fields.

Unfortunately, winter covers are not a panacea and will not solve all winter problems, including ice-related damage and crown hydration injury. Unless treated, cool-weather diseases are also more damaging under covers.

Summary

A better understanding, innovative ideas, genetic breakthroughs and even small miracles might be necessary to eliminate all forms of winter injury. However, using today's "best management practices" that promote rapid soil drainage and encourage healthy, winter-hardened turf going into winter is a grounds manager's best line of defense. ▲

John Roberts is an extension turf specialist at the University of New Hampshire.
This article was originally published in the October, 1996 issue of Sports Turf

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"Are you Putting your Field to Bed or Putting it Out to Pasture?"

by Dave Minner and Gary Peterson, Extension Turfgrass Specialist, Iowa State University

If you are putting your field to bed this fall and tucking it in nicely with some love and care than you can expect it to wake up next spring ready to go and ahead of the game. If you are darn glad the fall season is over and you don't want to see that field until next year, then expect it to look like a pasture because you are treating it like one. If you plan to use the field in early spring or summer than it will be in the same condition that you left it at the end of he autumn. Instead, trying to do all of the coring, seeding, and field preparation in the spring may leave too much to chance with wet or cold weather. Get a jump on next year by putting your field to bed so it will wake up ready to go. Here are a few end-of-the–season tips that will help you prepare your baseball/softball fields for next year.

Baseball/softball

The fall practice schedule for baseball and softball is usually *Continue on page 9.....*

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DID YOU KNOW?
The winter survival rate of seeding accomplished in December is many times greater than seeding accomplished in late October/November.

"Murphy's Law"

Dr. James Murphy is an Associate Extension Specialist in Turfgrass Management for Rutgers, department of Plant science. Ask Dr. Murphy your questions: E-mail us at hq@sfmanj.org

Question: I have read a number of articles written on the subject of late season nitrogen fertilization. Some recommend a fast acting nitrogen source with a relatively small percentage of slow release N and other articles recommend a product such as IBDU, with a very dependable slow release mode of action. What is your philosophy on late season N?

Answer: My philosophy on late season nitrogen (N) fertilization is to base your choice of fertilizer material and rate of fertilization on the needs of the turf. You can use either type of fertilizer source successfully if you recognize the types of growth responses you get from each type and use accordingly. Thus, if I could paraphrase your question, "How do I decide between fast acting (water soluble) and slow release nitrogen fertilizer for use in late season fertilization?"

First, a turf manager needs to recognize the growth pattern of cool season grasses in the fall. Grasses like Kentucky bluegrass, tall fescue, and perennial ryegrass will aggressively produce new tillers (shoots) and roots, and store carbohydrates (food) during the fall and winter, if sufficient N fertility is available.

Continued on page 8....

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Continued from page 7 "Murphy's Law"

Without adequate N, these growth responses occur, but at a more limited pace which may not be sufficient for damaged sports turf. Thus, cool season grasses will fill-in (recover from wear damage) and develop outstanding root systems if proper N is applied in the fall. A convenient advantage of fall fertilization is that you get these excellent growth responses without an excessive amount of vertical shoot growth and, thus, less mowing is required compared to spring fertilization.

Late season fertilization with water soluble (fast acting) N ensures that the turf will continue to store carbohydrates and develop new tillers (shoot density) and rooting during the mild winter weather and early spring. Therefore, sports fields that are severely worn will benefit more from water soluble (fast acting) nitrogen over slow release N. Slow release N will not provide as much available N in late fall and winter as water soluble N and, therefore, the fall growth responses will be reduced with slow release N.

The more slow release N you use in late season fertilization the more you are providing an early spring fertilization effect. Recognize that early spring growth in cool season grasses involves rapid green up and vertical shoot growth. Early spring growth consumes the carbohydrates (food reserves) stored in the fall and winter. Thus, excessive growth stimulation in early spring reduces some of the stress tolerance of the turf as well as increasing the demand for mowing. Use of slow release N in late fall is best suited for those fields that have good turf conditions in the fall and will require some early spring growth to withstand use/play at that time. Some of the slow release N will be available for late season growth responses, however most will stimulate spring growth responses.▲

Recommendations for nitrogen (N) source and rate to use for late season N fertilization.

	Weak, Thin Turf in Fall			Good Turf in Fall		
Form of N source	Fall Play	Spring Play	Fall & Spring	Fall Play	Spring Play	Fall & Spring
	---------- Approximate % of N source to use ----------					
Water Soluble (Fast acting)	70 to 100	50 to 70	50 to 70	70 to 100	0 to 30	50 to 70
Slow release N	0 to 30	30 to 50	30 to 50	0 to 30	70 to 100	30 to 50
	---------- pounds per 1000 ft^2 ----------					
Total N to Apply	1 to 2	1 to 2	2	1	1	1 to 2

Continued from page 6....."Are you putting your fields to Bed"....

not as demanding on the field as the spring game schedule. However, it is important to remember that the field condition entering the winter will be the same as the field condition during the start of the baseball/softball season, especially for college fields. College baseball/softball can start as early as 'February 15 and if the weather is nice they will be on the field. The spring schedule for high school usually starts later in the spring since the high school season continues in the summer after classes have ended.

- Skin areas are often left to fend for themselves during the winter. Strong winds can blow the infield dirt materials into the adjacent grass areas and cause large lips to build up during the winter. Boards or silt fence have been used to reduce blowing dirt. Another simple method described by Luke Yoder, Pittsburg Pirates, is to lay down 2-by-4 boards along the dirt infield and adjacent to the grass where the lip usually starts to form. Lay the boards flat and stake them if needed. The dirt piles up on the boards and is easily removed in the spring.
- Some high schools disk the skin area and leave it rough all winter. This works fine if you don't need the field until late spring. If you disk the skin area in the fall and need to have the field ready for play in March, you could have a problem. The worked-up infield will hold water and it may be impossible to drag and firm the surface until the surface has dried.
- Mound and batter box areas should be reconditioned in the fall and then covered with a tarp for the winter. Pull the tarp off in the spring and you are ready to go.
- Sod worn areas in front of the mound and at first and third so they will be ready in the spring.
- Avoid using non-selective soil sterilant herbicides on skin areas to prevent weed growth in skin areas. It is likely that these materials will field their way into the surrounding turf areas and cause injury.

The most important part of your fall program is to have a plan. Don't just drop the field after the last fall game and then try to get ready for next year in the middle of the summer. Autumn is the best time to prepare the field for the rest of the year and be sure that your implement your "putting the field to bed program" immediately after your last fall game. ▲

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"Getting Equipment Ready to go"

by Gilbert Pena, Marketing Mangaer, Commercial Mowing, John Deere Turf Care & Steve and Suz Trusty, Trusty & Associates

While many of us will put our mowing equipment to bed for the winter, others will continue in the snow removal season. As you finish storing mowing equipment, go ahead and get snow removal equipment ready to go for that first surprise storm.

A pre-season service for two-cycle machines should start with fresh fuel and oil. To prevent the engine from running hot, make sure to have a proper fuel/oil ratio mix. For models that don't require a fuel/oil mixture, add fresh fuel. Each model's operator's manual will have the exact measurements.

Check the belts on the drive mechanism to ensure that they still move freely and haven't hardened. If the belts have hardened, they're more likely to break during a job, leaving your customer with downtime.

Don't forget to lubricate, adjust and inspect all moving parts and safety devices before the first use of the season. Safety shields and guards should be in good shape and fastened in place.

To minimize chute clogging, try spraying slip-plate lubricant onto the surface of the chute.

For walk-behind snow removal equipment, make sure that the operator presence system is engaged.

Don't forget about safety. Take the opportunity to remind all operators of important safety precautions. Shop safety posters, for example, are an ideal way to inform your employees and customers about safe operating habits. Those practices include blowing snow away from people, parked cars and buildings; never putting hands in the discharge chute to unclog snow or debris and wearing protective eyewear and clothing. Again, since all models have specific safety features, refer to your operator's manuals for important seasonal safety tips.

Tackling the Equipment

Once the turf preparations for winter have been completed, it's time to concentrate on preparing the equipment. At the end of the mowing season, one of the worst things you can do to a mower of handheld product is to simply "put it up" until the next season. Proper store affects its useful life and reliability.

First and foremost, prepare eh fuel system for storage.

Continued on next page.....

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Continued from previous page "Getting Winter Equipment"

If left over long periods of time, fuel can deteriorate and turn into a gel or paste-like- substance that will clog the fuel lines and varnish the carburetor. You can either run the fuel completely out of the engine, or rotate the fuel shutoff value and run until the engine dies to empty the carburetor so it doesn't gum up. If you have a full tank of gas left and don't want to burn if unnecessarily, you can add a fuel stabilizer and run the engine for about 10 minutes to ensure that the stabilizer has been mixed with the fuel.

Change the oil and the oil filter (if equipped). True, the fresh oil will just sit over the off-season, but it will provide you and opportunity to examine the oil system for any contaminants. If you see anything unusual, you can have the problem repaired during normal downtime and prevent a slow start to the next mowing season. When changing the oil, if you notice milky oil or a shiny sludge in the filter, it is a sign of coolant leakage. If the oil smells burned, it is a sign of overheating. Put a dab of oil on a paper towel: A lighter stain "halo" around the darker stain indicates fuel in the oil. You may also be able to smell the fuel in the filter.

Servicing the air filter system at the end of the mowing season is especially important, if you plan to also use your mowing equipment for fall-cleanup activities such as mulching leaves. Using a mulching mower or a vacuum system makes leaf cleanup quick, but it's also a very tough environment for engines. The powdery residue, dust and debris can clog the air filter and prevent the machine from working at optimum power. When checking the air filter at such frequent intervals, special care needs to be taken not to break the seal and allow dirt and debris into the engine. To reduce the risk of additional contaminants, watch the air restriction indicator and wipe the area thoroughly before opening the system. Once the system is open, take advantage of the opportunity to inspect for any possible problems. Check intake hoses and the fill canister. Look for cracks, missing washers, seals and loose connections.

It's also recommended to service the spark plug. Remove the spark plug and put 1 once of oil in each cylinder. The oil creates a barrier to protect the cylinder wall and makes for easier starting next mowing season. Reinstall the plug, but leave the plug wire off. Then crank or turn the engine over five to six times to ensure that the oil coats the cylinder walls evenly.

Additionally, make sure to remove the battery, if applicable. Clean and charge as necessary, then store in a cool, dry place where it won't freeze. Removing the battery reduces sources of unintentional engine ignition and will help prolong battery life. If you have a hydrostatic unit, relieve the hydraulic pressure to prevent leakage.

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