

# Weathering the Winter

*Protecting your irrigation system from freeze breaks will help you avoid a "Spring surprise."*

By **DIRK LENIE**  
*The Toro Company*

It's a beautiful spring day, nearly 50 degrees and a wonderful break from the long winter of plowing snow, drinking hot chocolate and waiting for the first glimmer of warm weather.

Your first indications of winter's final passing mark the time for system start-up for the large irrigation systems across your grounds, campus or park. You begin by slowly opening the gate valve at the point of connection just to fill the lines. After a few seconds, you hear the rush of water continuing. Not far from where you are standing, you notice a flood of water collecting.

There is a break! Even though you blew the system out with compressed air last fall, there is a break. You shut the gate valve off and check the water meter to see if there is any movement...there is.

After getting a shovel to uncover the damage, your first look at the pipe tells the story. Long, spiraling, lengthwise cracks reveal a classic freeze break.

As any good grounds-care professional knows, proper winterization of a large irrigation system is essential to system maintenance. To avoid freeze damage, a system must be less than half-full of water when the cold weather hits. Yet in cases like the one described above, freeze problems can strike even when you follow standard procedure. Protecting your irrigation systems from the ravages of harsh winters is a matter of following good procedures and using the right equipment. Here are a few tips that may save you time and money.

## **Volume, Not Pressure**

Follow appropriate winterization guidelines. The key to a successful system blowout is not high pressure but a large volume of air. In a blowout, what's important is not the speed of the air, but having enough air to fill the system and push water out through the sprinkler heads. It is imperative with any medium or large system to use a compressor that can produce 100 to 150 cubic feet per minute (cfm) through the system components.

The temptation in winterization is to boost the pressure to get a better blowout. You might think, "If 150 cfm is good for blowout, isn't 100 pounds per square inch (psi) just as good?" Not at all! Valves and sprinkler heads are designed to run at water pressures between 75 and 100 psi. Air need only be sent through the system at 50 psi as long as you

have enough volume.

In fact, using a high psi could cause significant system damage. When compressed air is run through a sprinkler system at 100 psi or higher, many components exceed their design tolerances. Excessive wear or failure is usually the result. The faster everything works, the more friction is produced. You risk generating enough heat to melt plastic parts. Gear drives in the sprinkler heads and plastic fittings and pipe near the point at which the compressor is attached to the piping system are especially susceptible to heat damage. To avoid this problem, be sure that your compressor has a pressure regulator set at 50 psi or slightly less.

## **Monitor Your Valves**

Valves react differently when operated with air than they do with water in them. Air trapped in the upper part of the diaphragm sometimes makes valves shut down a bit, not open at all or refuse to close at the end of a cycle. Performing an external bleed may be time-consuming because it involves manually opening a valve to the atmosphere, but it is the only way to guarantee that valves will be open all the way.

By directing the flow of air and water through the valve bonnet into the atmosphere, you bypass the pressure drop through the metering system that you would get with an internal bleed and you completely empty the top of the diaphragm. If you suspect that a valve is shutting down partially, it's a good idea to do an external bleed.

Next, if you have a regulating valve set to normal desired outlet pressure, it could affect blowout if the normal pressure is less than 50 psi. In this case, the valve could shut down during blowout, causing you to get less than desired air pressure. To solve this problem, set the regulating valve at maximum pressure. This step ensures that the desired amount of air was sent through the system. However, it requires that you reset the regulating valve after completing the blowout. A simpler solution might be bypassing the regulating valve altogether by opening an external bleed.

It's never a bad idea to run air through your system twice at each winterization project. The extra time will be well spent if it gets rid of excess water that could settle in your system and cause costly freeze damage.

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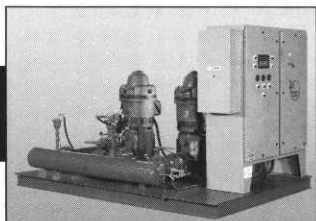


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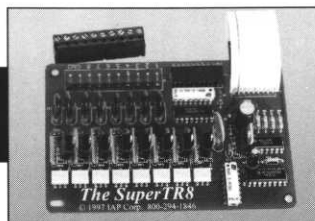
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## Weathering the Winter—

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### Low Head Puddling

Heads situated in low spots that will be at the bottom of a puddle when it rains need special attention. What often happens is that, on a warm winter day, snow melts and water collects around a sprinkler head at a low spot. The water seeps through the sprinkler head into the pipe and fills it more than half full. The temperature drops below freezing for 10 days, and the pipe freezes and breaks. Avoid this problem by installing check valves designed to prevent low-head drainage in the base of the sprinklers. This device will seal up the opening at the base of the sprinkler and prevent water from seeping through the head into the piping system. You should do this when the system is first installed, or before winterizing the first year after installation.

### The Right Valve For The Job

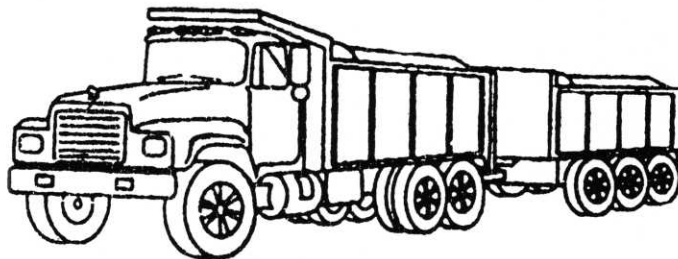
One of the best ways to protect your large irrigation system from freeze damage is to use the appropriate valves at the primary system shut-off location. A likely cause of pipe

cracks like the one described at the start of this article would be an inexpensive gate valve at the point of connection. When this valve fails, water will leak back into the system after you've completed a blowout. The water will freeze and create a long, spiraling crack in your pipe.

A better valve for a system with up to a 2-inch-diameter service would be a ball valve with a Teflon seat. This type of valve provides excellent protection against backflow at the point of connection. In a system where pipe diameter is greater than 2 inches, a butterfly valve with a Teflon seat will give reliable closure. Even though these components are expensive, the repairs they prevent would far exceed the cost of using these materials. Keep in mind that spending a little more on one key valve can mean the difference between a smooth start-up in the springtime and time-intensive, costly repairs.

As we all know, a smooth start-up is the goal of any grounds-management professional. Taking the time to perform the steps described here can increase the chances that your valves will survive the winter. And you can spend those first warm spring days letting winter memories fade rather than fixing winter's damage.

*(Editor's Note: Dirk Lenie is Director of Sales and Marketing for Toro Residential and Commercial Irrigation Products (Riverside, Calif.).*



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# Man's Friend or Golf's Enemy?

*Trees have long been known to hinder healthy turfgrass growth,  
but solving tree problems can be a difficult and touchy issue*

By DAVID A. OATIS

## Trees

by Joyce Kilmer

*I think that I shall never see  
A poem lovely as a tree.  
A tree whose hungry mouth is prest  
Against the earth's sweet flowing  
breast;  
A tree that looks at God all day,  
And lifts her leafy arms to pray;  
A tree that may in Summer wear  
A nest of robins in her hair;  
Upon whose bosom snow has lain;  
Who intimately lives with rain.  
Poems are made by fools like me,  
But only God can make a tree.*

"As beautiful as trees are, and as fond as you and I are of them, we still must not lose sight of the fact that there is a limited place for them in golf. We must not allow our sentiments to crowd out the real intent of a golf course, that of providing fair playing conditions. If it in any way interferes with a properly played stroke, I think the tree is an unfair hazard and should not be allowed to stand."

- Donald Ross, from *Golf Has Never Failed Me*

JOYCE KILMER had no idea of the damage that trees can inflict upon golf courses when he penned his immortal poem, "Trees." This is a poem that many adults can quote or at least recognize immediately, and it is the epitome of how many people feel about trees.

Fortunately for golfers and golf course superintendents, master architect Donald J. Ross also commented on trees. In his book *Golf Has Never Failed Me*, Mr. Ross spoke volumes in his simple, straightforward statement. Many courses would do well to take his message to heart. America has a love affair with trees, and there is much to love. Trees provide us with many practical and environmental benefits, and they are a phenomenon of nature that most find fascinatingly beautiful. Planting trees is an enjoyable pastime that can leave us feeling that we have made a lasting and beneficial mark on the earth. Since many of our home lawns are small, there often is limited space available to plant trees. For golfers, it is only natural that their tree planting efforts frequently are transferred to the biggest landscape they know, the golf course.

## The Problem

Most golf courses start out or eventually become overplanted with trees, and they eventually begin to suffer through all of the associated problems. Overplanting is inevitable for most courses. Once it occurs, the turf declines, playability suffers, views are lost, and the golf course gradually acquires a closed-in, claustrophobic feel. A common result of overplanting is that good golf holes are made unfair or just overly penal, and they become less enjoyable to play. Distinguishing design features frequently are obscured, the original intent of design is lost, and the altered holes wind up becoming gimmicky. It is at this point - when the care of the golf course and the turfgrass begins taking a back seat to the tree plantings - that the course begins a slow downward agronomic spiral.

Sometimes tree planting is taken to ridiculous extremes. This often is something that happens at courses where a "tree committee" or a "course beautification committee" has been appointed. Such committees can provide an invaluable service, but they also can get carried away. It only makes sense. After all, what is the duty of the tree committee if not to plant trees? Tree removal is often extremely unpopular, and at some courses, every tree becomes sacred, no matter how deformed, unhealthy or unsafe it becomes. Trees and tree planting must never be allowed to interfere with the fundamental objective, which is to grow healthy, reasonable-to-maintain turfgrass on which to play the game.

Tree problems come in a variety of forms, but they basically revolve around quantity, quality, and location. The wrong (species) tree in the wrong location can be disastrous for the turf. It also can greatly increase the cost of golf course maintenance. By now you might be concerned over the trees on your course, and you may be wondering just what you could do to determine whether your course has tree problems and just how severe they are. What makes for a good stand of trees? How does a course assess its tree situation?

## Getting Started

For years, Green Section agronomists have helped golf course superintendents and committees pull their courses out of the tree-induced death spiral, but it requires plenty of

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# Trees--

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hard work and communication. Golfers and board members who are willing to listen and be educated are a prerequisite. Over the years there have been many articles written on the subject of trees and their impact on playability and turfgrass health. A list of some of the better ones is included at the end of this article. Reading these articles is a great place to start for any course that is ready to get serious about its trees.

A quick tour of any course by a trained professional can quickly reveal whether extensive tree work is needed. However, considerably more time is required to determine the full extent of the work required. Although rare individuals have the knowledge and expertise to do an evaluation without assistance, the most prudent course of action usually is to perform a systematic evaluation, utilizing professionals from different disciplines. In this manner, the different perspectives can be discussed. The following are some good possibilities:

- ~Golf course superintendent
- ~Agronomist
- ~Arborist
- ~Golf course architect
- ~Golf professional
- ~Interested committee members

The goal should be to select a committee with varied backgrounds so all issues are considered. Starting the review process with the proper criteria on which to base decisions is critically important and should influence the selection of committee members. Depending on the size of the property, the number of plantings, and nature of the problem, effective and thorough tree reviews may take a few days to complete. The work identified may be so extensive that it could be scheduled in phases over a couple of years.

Although it may seem an overwhelming task, an excellent approach often is to evaluate each tree individually. Some courses have gone so far as to mark each tree in one of four ways:

- ~Prune
- ~Remove
- ~Relocate
- ~Do not touch

This time-consuming approach forces conscious decisions to be made regarding the fate of each tree and can result in better decisions. Just be sure to use a non-permanent marking system so that changes can be made easily. It also helps if the marking system is discreet, as this

will help avoid calling attention to the program and unnecessarily alarming golfers. Small pieces of color-coded plastic tape, stapled to the trees, work well. Marking paint also can be used but can be too persistent. In the Northeast, mid/late September is an ideal time to perform the review, with the work being carried out during the fall and winter months.

## The Criteria

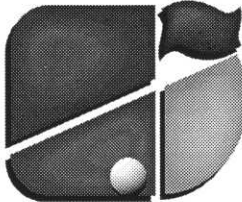
Next come the criteria, and this is where many courses get off the track. There are many reasons to plant and maintain trees, but the reasons should be reviewed, especially for trees that are having a deleterious impact on the course. Perhaps the first question to ask regarding such a tree is, "Does the tree have a specific purpose?" or "Is this tree necessary?" It certainly is not essential for every tree to have a specific purpose, but this is a good place to start for trees that are having an undesirable agronomic impact on the turfgrass. If the answer is no, the solution is straightforward. The following are some of the appropriate criteria to be used in the decision-making process:

- ~The desirability of the tree based on its species
- ~Golfer safety
- ~The general health of the tree, including its form and structure
- ~Life expectancy
- ~The impact on playability
- ~The impact on the agronomics of growing turfgrass
- ~The impact on traffic flow

## The Impact on Aesthetics and Surrounding Trees

The desirability based on species: Certain species are inherently more valuable than others. In fact, a guide for determining tree valuation has been developed by insurance companies with the help of the National Council of Tree and Landscape Appraisers. Because of the requirements of the game in general, and the turfgrass in particular, many species of trees are not well-suited to use on golf

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# Trees--

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courses. Fast growers, soft-wooded, or species with invasive roots are among the first to avoid. Dense canopied trees that cause excessive shade or create especially severe penalties to golfers are best left unplanted. Species that create litter or have severe pest problems also should be avoided. It gets even more complicated because species that may work well in one climate may be totally inappropriate in other climates. Regrettably, there are no perfect species, and selection often involves some trade-offs.

**Golfer safety:** Safety likely is the most serious consideration when evaluating trees. Tree failure cannot always be predicted, but trees with obvious structural problems must be removed, particularly when they are located in high play/traffic areas. Surprisingly often, large, damaged, severely declining trees are allowed to remain even though they may pose a serious injury threat to golfers or maintenance staff. This is an example of emotion getting the best of intellect. Simply put, preserving an old, dying, and obviously unsafe tree must not take precedence over protecting the health and well-being of human beings. No tree is worth more than a human life, but if the value of a human life is not enough to convince some, talk to the insurer - perhaps the liability issue will!

**General tree health including form and structure:** If the form, structure, or species is poor or undesirable, it should be considered for removal. Specific knowledge of trees and their growth habits therefore is essential, which is why an arborist should be included in the review process. This is not to say that all imperfectly formed trees should be removed; on the contrary, it is the nature of some tree species to have an irregular growth habit. The northern white pine (*Pinus strobus*) is just such an example. Mature specimens usually display an irregular growth habit, often as a result of ice damage,

which can be quite attractive. On the other hand, trees with naturally symmetrical growth habits that are somehow damaged and wind up misshapen, should be considered for removal. Trees that have to be over-pruned for playability reasons also fall into this category.

**Life expectancy:** Most tree species have predictable life expectancies that are greatly influenced by their care and location. A properly trained arborist can take the myriad of factors that affect individual trees into account and provide

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an estimate of a tree's life expectancy. This is not an exact science, but taking a tree's potential life span into consideration is helpful in long-term planning. It simply does not make sense to spend money on corrective pruning, pest control or fertilization for trees affected by a serious or incurable malady. Removal is usually the most fiscally prudent decision.

**The impact on playability:** Playability can be a gray area because there are few hard and fast rules in golf course architecture. However, an overriding principle to keep in mind is that "golf is a game, not a penance," and as such, it should be enjoyable. Trees that unfairly penalize one segment or another of the golfing population may not be appropriate. Dense canopied trees with low branching habits (cedars, spruce, etc.) present an extreme penalty, and usually are not appropriate in high-play areas. The following are a few other situations to avoid:

**Double hazards:** Trees or brush located in or in front of hazards (e.g. sand bunkers) that block advancement generally should be avoided. The game is hard enough without making it overly penal!

**Vegetation blocking play from a teeing ground:** Why build and maintain a tee that cannot fairly be used?

**Vegetation blocking play from a significant portion of a fairway:** A player who has hit a ball in the fairway deserves a shot at the green.

**Design alteration:** Indiscriminate tree planting can have an insidious impact on a good design. Do some of your tees point into the woods? Do some of the doglegs seem too severe? If so, chances are good that trees have altered the original intent of your design.

**The impact on the agronomics of growing turfgrass:** It is a well-known fact that trees compete effectively with turfgrass for moisture, nutrients, and sunlight. Some trees are worse offenders than others, and some turfgrasses are better adapted than others to handle the shade and root competition. However, in many situations trees and turfgrass simply are not compatible. If healthy, wear-tolerant turfgrass is to be maintained, the trees have to go.

Turfgrass grown in a shady, pocketed environment is physiologically different from turf grown out in the open. Reduced sunlight affects the growth habit of the turf, causing it to be more open and "leggy," much the same as a houseplant grown with insufficient sunlight. This leaves the turfgrass more succulent and susceptible to wear injury. Under low light conditions, the turfgrass also will suffer from reduced vigor. A good rule of thumb is that grass needs at least eight hours of direct sunlight to exhibit moderate recuperative

power, and turf that receives extra stress, wear, and tear (i.e. greens and tees) will perform better with even more light. Thus, trees that block sunlight must be considered for removal. All things being equal, morning sun is more valuable (e.g. for drying the turf) than afternoon sun, so concentrate efforts there first. Also realize that sun angles change dramatically throughout the year, and performing sunlight assessment without taking seasonal changes into consideration is a major mistake.

**The other major effect trees and brush can have is in reducing air circulation.** Reduced air circulation translates to increased temperature and relative humidity, and this favors the growth and development of many turfgrass pathogens. In summary, a poor grass-growing environment creates less vigorous turf that is more susceptible to injury and infection. When the turf suffers injury, whether it is through wear, fungal infection, nematodes or insect infestation, the damage is enhanced and the recovery is hampered by the lack of adequate sunlight.

In many cases, superintendents are successful in overcoming poor grass-growing environments and are able to produce good playing conditions despite the handicap of a poor environment. However, few will dispute the added cost and extra effort involved. For golfers wishing to minimize the use of pesticides, the poor grass-growing environment will prove difficult to deal with. Failure to provide turf with its most basic needs clearly increases labor requirements and the use of pesticides. It also is the limiting factor in achieving the desired level of playability. All of this translates into more expensive golf.

**The impact on traffic flow:** The placement of any physical obstruction in a high-traffic area results in concentrated and impossible-to-manage wear problems. When the obstruction is a tree, the problems with the turf are magnified because of the added stress of tree root competition and shade. Thus, it is recommended to refrain from planting trees or other vegetation in high-traffic areas. Keeping these areas as open and unobstructed as possible will result in healthier and better playing turf.

**The impact on aesthetics and surrounding trees:** Although it is well understood that trees compete with turf,

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