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Snow Removal

Snow can often be an issue on fields that are used late into the playing season. Early season snow storms are also a consideration in northern climates. As a sports turf manager, it is your job to ensure the field is clear of snow and ready for play. When planning snow removal, consider the following variables:

- How much snow is predicted?
- How much snow has accumulated?
- What type of snow is it - wet and heavy or light and powdery?
- How soon does the turfgrass surface need to be used?
- What does the client want?
- What do field users need?
- What are space limitations of the field area – are there open areas to push the snow or is it a small, confined area that the snow must be removed from the site?
- What time of year is it – is the ground frozen to support snow removal equipment?
- Will daytime high temperatures allow for any melting?

Knowing the answers to these questions can help put a plan in place to prevent field damage and ensure snow removal is an efficient process. The following provides recommendations for effective snow removal from natural grass and synthetic surfaces to keep fields safe and ready for play.



Photo courtesy of Brad Fresenburg, Ph.D.

Natural Turfgrass Fields

Time of year and temperatures have a significant effect on the turfgrass plants and soil environment. In the fall, the ground may not yet be frozen solid. Removing snow accumulations from unfrozen ground can cause substantial damage to an athletic field. If the turfgrass plants have had the opportunity to harden off, soils have frozen, and temperatures have gradually dropped, there is less chance for field damage from snow removal.

If a field is not being used throughout the winter months, a dense blanket of snow is the ideal scenario to ensure turfgrass survival by protecting the crowns from frigid temperatures. If the area is not affected by ice, allow nature to take its course with respect to snow cover. To assist with snow melt, clearing a path or channel along the perimeter of the field allows water from melting snow to flow off of the surface. If fields have been under snow cover for an extended period, once snow melts, turfgrass managers may notice snow mold development. Depending on field history and if the field must be in game-ready condition in early spring, turfgrass areas will benefit from

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fungicide applications prior to snow events. In conditions favorable for snow mold development, unprotected turf can suffer from severe damage compared to turf protected with effective fungicides. Consult your local extension office or area sports turf consultants regarding fungicides suitable for your location and this disease.

The turfgrass area may face significant problems if the turfgrass plants are sealed beneath a layer of ice. Snow cover over ice-affected turfgrass can increase the potential for ice suffocation. Anaerobic conditions can develop and the lack of oxygen can kill turf. More extensive damage is likely if ice impacts the surface before turfgrass plants have had a chance to harden, the ground has not frozen, and the temperature plummets. The following strategies are effective when dealing with ice on fields:

- Remove snow from fields that have six or more weeks of uninterrupted ice cover. Snow can be removed from the surface using a shovel or a snow blower. Make sure the setting on the snow blower is high enough that it does not scrape the turfgrass surface.
- Apply a darkening agent to the surface to assist with ice melt and help vent the area of anaerobic gas accumulations. Darkening agents can include colored sand, compost, humates, or dark-colored organic fertilizer products, such as Milorganite. Black turf paint or green turf dyes can also be used to melt snow and ice. Inert products are the most desirable. Avoid the use of synthetic fertilizers that are high in nitrogen and/or phosphorus as they can impair water quality.
- Break up the ice using the shallow setting on an aerifier or by driving a tractor or mower over the surface. Remove the ice using hand shovels or allow it to melt.

If the field is being used for athletic events, snow clearing operations should begin immediately so the field is safe and ready for play. The following methods can be implemented to efficiently remove snow accumulations:

- If possible, tarp the field when snow is forecasted. Snow removal will be easier with a tarp and there is reduced chance of turfgrass plant damage from clearing operations.
- Remove snow early in the morning or on cloudy days when the snow is cold and firm. Snow will be lighter and can be blown away more easily. Mechanical injury is also less likely to occur to the field and turfgrass plants.
- If dealing with dry snow, blowers attached to a tractor or work vehicle can be used to blow off lower accumulations. This should not cause any damage to the turfgrass plants.
- When heavy accumulations are predicted, try not to allow more than 2-4 inches to accumulate on the surface at a time. If possible, remove snow throughout the storm. Begin clearing operations as soon as there is an inch of accumulation and continue removal throughout the storm.
- Snow can be mechanically removed using walk behind snow blowers or a plow with a piece of PVC pipe fitted over the blade. Do not mechanically remove snow down to grass level. Allow ¼-1/2 inch of snow to remain on the surface. The last ¼-1/2 inch protects against damage to the turfgrass surface and/or tarp. The remaining layer can be melted by the sun, removed using hand shovels, or melted with a darkening agent.
- When removing accumulations over 1 foot, use tractor mounted removal methods such as a plow, front-end loader, or snow blower. Remove down to about 10-12 inches. Remove the remaining 10-12 inches of snow using walk behind snow blowers or a plow. Set the snow blower or plow so ¼-1/2 inch of snow remains on the surface. Hand shovels, darkening agents, or the sun can remove the remaining ¼-1/2 inch layer.
- In small, confined areas, the snow may need to be loaded in a truck and hauled away. Otherwise, the snow can be piled outside of the sidelines.
- If ice is present on the turfgrass surface, it can be broken up using the shallow setting on an aerifier or by driving a tractor or mower over the surface.

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- Apply a darkening agent to the surface to assist with snow or ice melt. Darkening agents can include colored sand, compost, humates, or dark-colored organic fertilizer products, such as Milorganite. Black turf paint or green turf dyes can also be used to melt snow and ice. Inert products are the most desirable. Avoid the use of synthetic fertilizers that are high in nitrogen and/or phosphorus as they can impair water quality.
- To prevent melted snow from refreezing, use rollers and squeegees to eliminate puddles on the surface.



Photo courtesy of Brad Fresenburg, Ph.D.

Synthetic Turf Fields

Be sure to check with the synthetic turf manufacturer before plowing snow from the field. Plowing can wear fibers on the surface and may void the warranty of the field. If snow is in the forecast, tarp the field if possible. Snow removal will be easier with a tarp and there is less chance of damage to the synthetic surface.

Snow can be removed from a synthetic field as soon as it starts to fall. Try not to allow more than 2-4 inches to accumulate on the field. When high accumulations are predicted, remove snow throughout the storm as soon as there is an inch of accumulation. Methods for snow removal include the following:

- If dealing with dry snow, blowers attached to a tractor or work vehicle can be used to blow off lower accumulations.
- If dealing with wet snow, plows attached to work vehicles can be used to remove snow. Do not use a metal tipped plow. Instead, use a plow with a rubber tip, or fit PVC pipe over the plow blade edge.
- When removing accumulations over 1 foot, use tractor mounted removal methods such as a plow, front-end loader, or snow blower. Remove down to about 10-12 inches. Remove the remaining 10-12 inches of snow using walk behind snow blowers or a plow. Set the snow blower or plow so $\frac{1}{4}$ - $\frac{1}{2}$ inch of snow remains on the surface. The goal is to leave $\frac{1}{4}$ - $\frac{1}{2}$ inch of snow on the surface. Do not scrape the surface clean, especially if the field is not tarped. Scraping the surface clean may result in removal of crumb rubber and fraying of the synthetic turf fibers.
- By leaving $\frac{1}{4}$ - $\frac{1}{2}$ inch of snow on the surface, managers do not need to be concerned with plowing against the seams. To further prevent damaging the seams, never plow at more than 10 mph and take your time so the plow does not bounce.
- The last $\frac{1}{4}$ - $\frac{1}{2}$ inch of snow can be removed using black crumb rubber or the sun. Ice melt and deicer have been used in the past to melt snow, however, ice melt can cause skin irritation to athletes and deicer can turn into a sticky substance when it mixes with the turf. Therefore, use of ice melt and deicer should be avoided. Black crumb rubber is the preferred method because it is safe for athletes and reincorporates into the synthetic system. Allowing the field to sit in the sun for 20-30 minutes after clearing operations can also melt the last of the snow. Running a field groomer over the last bit of snow can assist in dissolving it.
- Ice presents an issue for synthetic fields because water can freeze both in and on the field. When melting snow, there is always the possibility it may refreeze as ice. Driving a tractor or mower over the surface may be effective at breaking the ice up. The sun and black crumb rubber can be utilized to melt the ice and try to dry the field out. If time and money allow, a tarp can be used to cover the field and heaters can be used to blow hot air under the tarps and dry the field out. This method was utilized at University of Minnesota. Four heaters

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supplying 2 million BTUs each heated the fields beneath tarps. The heaters melted the ice and dried the remaining snow to leave the field softer and more playable. The heated tarps also kept additional snow from accumulating prior to game time.

Time and labor may provide an obstacle for many turf managers when it comes to snow removal. Enlisting volunteers to help remove the snow may be an option. For example, athletic teams may be willing to help remove snow. In 2010, the Maryland Baseball Team helped remove 4 feet of snow from Bob “Turtle” Smith Stadium and Shipley Field so they could continue practices outdoors. Another option may be to outsource snow removal operations. There are many commercial companies that can be used to remove snow.

Be Prepared

As a sports turf manager it is important to always be prepared. Have a snow removal plan in place before bad weather hits. Pay attention to weather forecasts and prepare your crew and your field for snow events. Having a plan in place will help you maintain professionalism and communicate needs and expectations to users, coaches, media, and the public.

References:

Contributions by STMA Information Outreach Committee

Photos provided by Brad Fresenburg, Ph.D.

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