City of Billings PRPL
Athletic Field Management Plan

Purpose

The City of Billings has a responsibility to develop public policies that address turfgrass use, safety and overall management within its jurisdiction. An Athletic Field Management Plan will provide overall direction to the City and User Groups in the management of athletic fields. The Athletic Field Management Plan will provide sound direction in the maintenance of athletic fields to ensure optimum benefits to the community and user groups.

Identifying Athletic Field Types

There are two types of athletic fields with differing levels of maintenance and areas of responsibility. The Athletic Field Management Plan applies to both types of athletic fields. Baseball and Softball fields also need to follow the Infrastructure Management Plan.

1. Soccer, Rugby, Football, and Lacrosse fields.
2. Baseball, Softball fields including fencing, bleachers, and infields.

Athletic Field Turfgrass Management Plan

The goal of the turfgrass management plan is to produce and maintain healthy turf. A healthy turf produces the best possible sports conditions for all users and will have the following benefits:

1. Turf can recover more quickly from the wear and tear of intense sports activities, resulting in safer playing surfaces with fewer weeds and areas of compaction.
2. Thicker, healthier turf allows for better water retention and less exposed soil surface, thereby reducing water evaporation and water run-off.
3. Potential pest problems are reduced.
4. Proper use of resources like fertilizer, herbicides, water, and labor.
Irrigation

Irrigation scheduling seeks to apply the proper amount of water needed to satisfy the plant’s needs. Turfgrass can use over 1.5 inches of water per week in hot weather, and can decrease usage to under .5 inches in cooler weather. Daily adjustments have to be made to prevent over or under watering the turf. A good understanding of the site and soil conditions serves as a major benefit in developing an efficient irrigation schedule. Other factors that influence irrigation scheduling is, plant protectant and fertilizer applications, scheduled events on the field, and mowing schedule.

Mowing

Maintaining proper mowing height is essential to good turf health, as well as providing the best condition for events. Mowing turf too short damages the plants, encourages weeds, and increases moisture stress. When adjusting a mowing height no more than 1/3 of the leaf tissue should be removed at a time. Cutting height should be adjusted to always maintain the turf at the highest height possible depending on the season. During the off season mowing height should be adjusted to three inches.

Fertilizer / Nutrient Management

The use of fertilizer on sports fields is necessary to ensure repair from intense use, and maintain good turf health. Soil tests and good record keeping are essential to prevent over application and to judge the success of the management decision to apply fertilizer. The use of slow release fertilizers is necessary to deliver the turfgrass the nutrients needed for repair without causing a flush of growth that is detrimental to the turf quality and health. Also slow release fertilizers reduce labor costs because fewer applications are needed during a growing season. Fertilizer technology has improved to the point that a single application can provide season long nutrient delivery.
Nutrient management for turf involves:

1. Analysis of the existing condition and fertility of the soil that provides the growing medium for the turf and influences site characteristics such as drainage and water infiltration.
2. Careful consideration of the nutritional requirements of the turf, based on several variables including soil fertility, expected quality of the turf, use of the turf, suitability of the growing environment, and grass species present.
3. Informed and judicious additions of nutrients into the turf system with regard to proper timing, proper application rate, proper material selection, and proper placement, with the intention of meeting expectations for turf function and aesthetics.
4. Reduction of fertilizer application to the lowest level possible, in addition to the use of turf cultural practices designed to maximize efficient use of nutrients by the plants in the system, thereby eliminating waste and minimizing nutrient loss.
5. Appropriate accounting for all nutrient inputs and record-keeping of other cultural practices that influence nutrient relations in the turf system.

Re-seeding

Once a field becomes so worn that there are bare areas seed needs to be reestablished. New varieties may give some advantages in wear tolerance and other desirable traits, but may not blend well with the existing stand of turf. Over-seeding can help in areas that are prone to heavy use by having the seed in place and allowing the traffic to place the seeds in contact with the soil. Heavy use areas should be over-seeded throughout the season. Once an area has to be re-seeded it needs to be treated like such and receive regular watering throughout the day and have all traffic removed until the plants become established.
Aeration

Aeration is the process of providing a pathway for air to enter the soil environment, and is vital to maintaining the oxygen level on the soil. Oxygen is important for good root growth. A major contributor to poor aeration is soil compaction caused by vehicle or foot traffic. A number of tools are available to improve soil compaction and increase aeration. Coring (the process of removing a core of soil) is the most productive method. Other cultivation methods include solid tines, slicing and spiking. These methods do not improve soil aeration to the same extent as coring, but are less disruptive to the surface. A good aeration program utilizes both methods, coring during off season and spiking or slicing during season. Coring remains the single most important tool in controlling soil compaction. Coring must be done twice a year to maintain safe sports fields.

Soil compaction creates turf management problems caused by altering the soil’s physical properties.

1. Soil pore space changes to an increase in micropores and a decrease in macropores. This leads to poor drainage and decreased air exchange. Water moves very slowly through micropores so soil saturation increases and oxygen levels decrease.

2. Soil strength and density increase which impedes the depth of root growth, and root density.

3. Soil saturation becomes an issue. Water doesn’t move through the soil quickly enough so the soil remains saturated. Conversely once the soil does dry out it becomes very difficult to rehydrate to proper depth without the surface becoming over saturated.
**Top Dressing**

Top dressing is a process of lightly applying sand and organic material to a field. This is done to level fields to provide a smooth playing surface, and encourages lateral growth of the turfgrass. Over time holes and depressions develop on fields either from heavy use or events like irrigation repairs, and the damage caused by burrowing animals, top dressing is the best method to level these areas. Top dressing applied with over-seeding can dramatically improve the germination percentage of seeds. Top dressing following core aeration can fill the holes with loose material that resists compaction and improves air flow into the soil for an extended period increasing the benefits of core aeration.

**Herbicides**

*Herbicides can only be applied by a licensed applicator. If herbicide applications are contracted out the contractor needs to follow all State laws that apply.*

Controlling weeds in a sports turf is necessary for the health of the turf. Weeds occupy space needed by the turfgrass, rob moisture from the turf, and have different growth patterns than turf does. Weeds can shade the turf, utilize nutrients necessary for healthy turf, and some weeds have thorns or sharp seeds.

Weeds are any plants in an undesirable location. They can be broad leaf or grass species. Weeds compete with desirable plants, are unsightly, and can pose a hazard. A thick, resilient sports turf prevents injuries, provides quality of play for users, and optimizes the efficient use of water. To control weeds the proper treatment must be applied at the correct time of year and growth stage of the weed. A treatment that doesn’t follow these requirements is a waste of money and can actually cause damage to desirable plants.
Summary

The Athletic Field Maintenance Plan is exactly that, it is a plan, and all the pieces are interconnected. If one area of the plan is neglected, that neglect affects other areas of the plan. You could be mowing at the correct height, and have the proper fertilizer applied, but if the soil is compacted the desired results will be less than expected. The included Field Maintenance Schedule is designed to pull all the pieces of the plan together for a complete season. The schedule allows the City to assist in the development and implementation of the plan, and provide the necessary parts that we provide at the correct time.
Figu2 Vegetation Management Toolbox